

संदर्भ क्र. : शिवाजी वि./अमं /148

दिनांक:- २८/ ०२/ २०२४

प्रति,

मा. संचालक,

दूरशिक्षण व ऑनलाईन शिक्षण केंद्र,
शिवाजी विद्यापीठ, कोल्हापूर

मा.प्राचार्य/संचालक,

सर्व संलग्नित महाविद्यालये/मान्यताप्राप्त संस्था,
शिवाजी विद्यापीठ, कोल्हापूर

विषय :-दूरशिक्षण व ऑनलाईन शिक्षण केंद्राकडें ऑनलाईन मोडद्वारे सुरु असलेल्या
एम.बी.ए.(ऑनलाईन) या पाठयक्रमाच्या अभ्यासक्रमातील नियमावली सुधारणेबाबत

संदर्भ :- SU/BOS/Com & Mamt./0067 Date 04/04/2022 रोजीचे पत्र

महोदय/महोदया,

उपरोक्त विषय संदर्भानुसार आपणास कळविण्यात येते की, विद्यापीठ अधिकार मंडळाच्या निर्णयानुसार शैक्षणिक वर्ष 2021-22 पासून दूरशिक्षण केंद्रांतर्गत ऑनलाईन एम.बी.ए. हा अभ्यासक्रम ऑनलाईन मोडद्वारे सुरु करणेत आला. तसेच अधिकार मंडळाच्या निर्णयानुसार SU/BOS/Com & Mamt./0067 Date 04/04/2022 रोजीच्या पत्रानुसार सदरचा अभ्यासक्रम लागू करण्यात आला आहे.

दूरशिक्षण व ऑनलाईन शिक्षण केंद्रांतर्गत ऑनलाईन एम.बी.ए. अभ्यासक्रमाकरीता विद्यार्थ्यांची प्रवेश परीक्षा, यु.जी.सी. अथवा ए.आय.सी.टी.ई मार्फत प्रवेश परीक्षेस अनुसरून 4 सप्टेंबर, 2020 चे राजपत्र तसेच शैक्षणिक वर्ष, 2023-24 करिता असणा-या प्रवेशाबाबतच्या मार्गदर्शक सूचना, प्रश्नपत्रिका स्वरूप, प्रवेशाची पात्रता इत्यादी बाबींचा विचार करून विद्यापीठ अधिकार मंडळाने घेतलेल्या निर्णयानुसार एम.बी.ए. ऑनलाईन अभ्यासक्रम व त्याच्या नियमावलीत दुरुस्ती करण्यात आली आहे. (सोबत :सुधारित अभ्यासक्रम व नियमावली जोडली आहे.)

उपरोक्त बाब सर्व संबंधित शिक्षक व विद्यार्थी यांच्या निदर्शनास आणावे. तसेच सुधारित अभ्यासक्रम व नियमावली विद्यापीठ संकेतस्थळावर www.unishivaji.ac.in (Online Syllabus) ठेवण्यात आली आहे.

कळावे,

आपला विश्वासू
(~~डॉ. एस. एम. कुबल~~)
उपकुलसचिव

सोबत : वरील प्रमाणे

प्रत :

1. मा. अधिष्ठाता, वाणिज्य व व्यवस्थापन विद्याशाखा, शिवाजी विद्यापीठ, कोल्हापूर
2. मा. संचालक, परीक्षा व मूल्यमापन मंडळ
3. परीक्षक नियुक्ती अ व ब विभाग
4. इतर परीक्षा 1 विभाग
5. आय.टी. सेल

माहितीसाठी व पुढील योग्य त्या कार्यवाहीसाठी



Estd:1962

NAAC “A+ +” Grade with CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR
CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)

Syllabus For

Master of Business Administration (MBA)

Through Online Mode

Part – I (Semester- I & II)

Under the Faculty of Commerce and Management

(To be implemented from 2021-22)

SHIVAJI UNIVERSITY, KOLHAPUR
CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
MASTER OF BUSINESS ADMINISTRATION (MBA) PROGRAMME
Through Online Mode
(AICTE Approved)
(Introduced from the Academic Year 2021-2022 onwards)

Shivaji University, Kolhapur is one of the oldest, premier, NAAC 'A++' Reaccredited, State University. Centre for Distance and Online Education is offering AICTE Approved Master of Business Administration (MBA) programme through Online Mode from the academic year 2021-2022 under the Faculty of Commerce and Management. It has one thousand intake capacities and the programme is designed by considering the achievements of the following aims:

1. Aims of the Programme:

1. To strengthen conceptual base of executives.
2. To help them improve decision making ability, creative and logical thinking.
3. To improve analytical ability, problem solving skills and judgmental ability.

2. Duration of the Programme:

- The duration of the programme is two years divided into four semesters.
- There will be semester end examination in the winter and summer session for all the semesters, besides that in each semester, a candidate has to complete continuous internal evaluation as prescribed by the Centre for Distance and Online Education.

3. Eligibility Criteria for Admission:

A Learner residing within or outside India may enroll for M.B.A. through Online Mode programme by fulfilling following norms:

- Graduate of minimum 03 years duration from any faculty from any recognized University with minimum 50% marks for General Category and 45% for reserved categories. (for reserve category, candidate has to produce relevant documents that are applicable to concern Reservation Policy from time to time.)
- If Candidate obtained Graduation from any Foreign Institute, then Learner has to produce 'Equivalence Certificate issued by the Association of Indian Universities' for admissions.

4. Entrance Test:

- To get admission to Online MBA Programme; **there will not be any Entrance Exam.** Learners may directly apply for Admission whenever notified by Shivaji University, Kolhapur.

5. Fee Structure

- **Fee Structure for MBA through Online Mode Programme**

Learners have to pay the prescribed fees through Internet Banking, Credit Card/ Debit Card (RuPay/Visa/MasterCard/Maestro), Internet Banking, IMPS, Cash Cards/ Mobile Wallets (additional service charges, as per rules, shall be applicable in addition to the application form processing fees). This fee is non- refundable and non-transferable under any circumstances.

For Learners from India	₹ 1,20,000 /- (Excluding Examination and Other Fees) (For 4 Semesters)
For Foreign Learners	US \$ 1760 (Excluding Examination and Other Fees) (For 4 Semesters)

6. Documents Required for the Admission

❖ For Indian Learners

- Colour Scan Copy of SSC, HSC and Graduation mark sheets.
- Caste Certificate (If applicable).
- Recent passport size photograph Scan copy and Scan signature of the student.
- Any Govt. ID Proof such as Aadhaar Card, PAN Card, Passport etc.

❖ For Foreign Learners

If Learner obtained Graduation from any Foreign Institute, then he / she has to produce 'Equivalence Certificate issued by the Association of Indian Universities' for admissions.

7. Pattern of Examination:

Examination of each course will be divided as 20 Marks for Internal Evaluation and 80 Marks for Semester-End-Examination.

1. Internal Evaluation (of 20 Marks) for each Course will consists of;

a. For Semester-I and II:

Home Assignments to be hand written by Learner and to be uploaded on LMS.

b. For Semester- III and IV:

Uploading the Recorded Video on Case Presentation on LMS.

2. Semester End Evaluation (of 80 Marks) for each Course will consists of;

Nature of Question paper and Scheme of marking for all courses are as follows:

1	Nature of Examination	Proctored Online Examination through LMS
2	Nature of Questions	Multiple Choice Questions (MCQs)
3	Number of Questions	80 Multiple Choice Questions (MCQs)
4	Marks for Each Question	01 Mark
5	Marking Scheme	01 Mark for Every Correct Answer. No Negative Marking
6	Specific Nature of Questions	Multiple Choice Questions (MCQs) be asked in the form of- • Case Study followed by MCQs (Long Case followed by 05 MCQs) • Caselet followed by 01 MCQ
7	Difficulty Level	Question Paper must have – • 30 MCQs- Easy Level-Covering Basic Conceptions • 30 MCQs- Moderate Level- Covering Quick Decision-Making abilities. • 20 MCQs- Hard Level- Covering Analytical Thinking and its Applications
8	Time Duration	03 Hours (i.e., 180 Minutes)

8. Standard of Passing

1. Standard of Passing:

1. There will be separate head of passing for internal evaluation and Semester-End-Examination. Such internal evaluation is of the 20 Marks and learner required to earn at least 10 Marks for passing of one course and there are 80 Marks for Semester-End-Examination and learner has to earn at least 40 Marks for one course, that means 50% Marks learner has to earn for passing under each head.
2. No Class / Grade will be awarded to any part of examination. It will be awarded in aggregate; after successfully completion of all the courses.

2. Passing Rules:

1. For admission to MBA Part-II, a Learner has to clear at least 11 courses of Sem-I and II all together.
2. If a Learner fails in any no. of Courses of Sem.-I; shall be allowed to proceed to Sem.-II. Similarly, if a Learner fails in any no. of Courses of Sem.-III; shall be allowed to proceed to Sem.-IV.
3. Learners have to complete MBA Programme within 2+4 years from the date of admission. If Learners fail to complete the programme within the stipulated period, then their registration to the said programme stand cancel.

9. Program Outcomes:

1. Recognize the functioning of business opportunities involvement of business enterprises and exploring the entrepreneurial opportunities.
2. Develop incubation center and entrepreneurship development center for students who intent to take up start up or grow existing business.
3. Develop skills on analyzing the business data application of relevant analysis and problem solving.
4. Demonstrate a global outlook with the ability to identify aspects of the global business and cross-cultural understanding.
5. Identify the contemporary social problems, exploring the opportunities for social entrepreneurship, designing business solutions and demonstrate ethical standards in organizational decision making.
6. Develop effective and oral communication especially in business applications, with the use of appropriate technology.
7. Collaborate and lead teams across organizational boundaries and demonstrate leadership qualities, maximize the uses of diverse skill of team members in the related context.

10. Syllabus of Master of Business Administration through Online Mode:

The entire MBA through Online Mode programme is of 2900 Marks.

Each paper is of 100 marks. Project Viva Voce is of 200 Marks.

MBA Part-I Semester-I

Paper No.	Course Code	Course Titles	Course credits	Internal Evaluation	University Evaluation	Total Marks
1		Management Philosophy	4	20	80	100
2		Management Accounting	4	20	80	100
3		Business Statistics and Analytics for Decision Making	4	20	80	100
4		Managerial Economics	4	20	80	100
5		Computer applications for business	4	20	80	100
6		Managerial Skills for Effectiveness	4	20	80	100
7		Organizational Behavior	4	20	80	100
		Total	28	140	560	700

MBA Part-I Semester-II

Paper No.	Course Code	Course Titles	Course credits	Internal Evaluation	University Evaluation	Total Marks
8		Marketing Management	4	20	80	100
9		Financial Management	4	20	80	100
10		Human Resource Management	4	20	80	100
11		Operations Management	4	20	80	100
12		Legal and Business Environment	4	20	80	100
13		Research Methodology	4	20	80	100
14		Strategic Management	4	20	80	100
		Total	28	140	560	700

MBA Part-II Semester-III

Paper No.	Course Code	Course Titles	Course credits	Internal Evaluation	University Evaluation	Total Marks
15		Chh. Shivaji Maharaj -The Management Guru	4	20	80	100
16		Project Report and Viva	8	100	100	200
17		Elective I– Paper I	4	20	80	100
28		Elective I– Paper II	4	20	80	100
19		Elective I– Paper III	4	20	80	100
20		Elective II- Paper I	4	20	80	100
21		Elective II- Paper II	4	20	80	100
22		Elective II- Paper II	4	20	80	100
Total			36	240	660	900

MBA Part-II Semester-IV

Paper No.	Course Code	Course Titles	Course credits	Internal Evaluation	University Evaluation	Total Marks
23		Elective I- Paper IV	4	20	80	100
24		Elective I- Paper V	4	20	80	100
25		Elective I- Paper VI	4	20	80	100
26		Elective II- Paper IV	4	20	80	100
27		Elective II- Paper V	4	20	80	100
28		Elective II- Paper VI	4	20	80	100
Total			24	120	480	600

***27courses of 100 Marks each and 1 course of Project Viva Voce of 200 Marks**

-Grand Total 2900 Marks. Each course is of 4credits. Total programme is of 116 credits.

* Candidates are required to select any Two Electives (Elective I & Elective II) from the lists given below for the two courses separately.

Each elective has 6 papers which are included in–

(i) Semester- III

- Elective-I (Paper I, II and III)
- Elective-II (Paper I, II and III)

(ii) Semester- IV

- Elective-I (Paper IV, V and VI)
- Elective II (Paper IV, V and VI)

Electives:

- | | |
|---------------------------------------|---------------------------|
| 1. Marketing Management | 6. Entrepreneurship |
| 2. Financial Management | 7. Business Analytics |
| 3. Human Resource Management | 8. Hospitality Management |
| 4. Production & Operations Management | 9. Health Care Management |
| 5. International Business | |

Project Work:

The students have to undergo practical training of 50 days in any manufacturing or service organization and they have to submit their project report up to the fourth semester. The project work must have a Certification from the organization.



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SHIVAJI UNIVERSITY, KOLHAPUR
CENTRE FOR DISTANCE AND ONLINE EDUCATION

Guidelines for Question Paper Setters

MBA through Online Mode

Proctored Online Examination

Introduction

The MBA Programme through Online Mode is designed to provide learners with flexible, technology-enabled education while maintaining academic rigor and integrity. In order to evaluate learners effectively, examinations are conducted in a **proctored online environment** through the Learning Management System (LMS). The question papers must reflect the programme’s objectives by assessing not only conceptual understanding but also the analytical, decision-making, and problem-solving abilities of students.

These guidelines are prepared to assist paper setters in designing question papers that are balanced in terms of **difficulty level, coverage of syllabus, and question formats**. By following these instructions, paper setters will ensure uniformity, fairness, and validity in the examination system, thereby upholding the quality standards of the MBA programme.

1. Mode of Examination

- The examination will be conducted through **Proctored Online Mode** using the University LMS.
- Students will attempt the paper remotely under AI-enabled and human proctoring to ensure academic integrity.

2. Structure of Question Paper

- **Total Questions:** 80 MCQs
- **Total Marks:** 80 Marks (1 Mark for each question)
- **Duration:** 3 Hours (180 Minutes)

3. Question Format

Paper setters must design questions in the following formats:

1. **Case Study-based MCQs** – Each long case study will be followed by **5 MCQs** testing comprehension, application, and decision-making.
2. **Caselet-based MCQs** – Each short caselet followed by **1 MCQ** testing quick analysis.



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4. Distribution of Difficulty Level

Paper setters should ensure balanced difficulty levels as follows:

Difficulty Level	Number of Questions	Nature of Questions	Expected Competence
Easy	30	Basic conceptual understanding	Recall & recognition of core concepts
Moderate	30	Application & decision-making	Ability to apply concepts and make quick decisions
Hard	20	Analytical & problem-solving	Higher-order thinking and critical reasoning

5. Blueprint for Paper Setting

- **Case Studies:** At least 2–3 long case studies (each with 5 MCQs).
- **Casellests:** Minimum 5 casellests (each with 1 MCQ).
- **Coverage:** All units/modules of the course should be adequately represented.

6. Nature of Questions

- **Easy Level:**
 - Straightforward recall of definitions, theories, frameworks, and basic facts.
- **Moderate Level:**
 - Involve small scenarios requiring quick decision-making.
- **Hard Level:**
 - Require analytical thinking, problem-solving, and application in complex situations.



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7. General Instructions for Paper Setters

1. Ensure **clarity, precision, and unambiguity** in question framing.
2. Avoid repetition of questions across different sets.
3. Questions should be **syllabus-aligned** and mapped to **Course Outcomes (COs)**.
4. Options should be **logical** and **mutually exclusive**.
5. Case studies and casellets must be realistic, management-oriented, and industry-relevant.
6. Provide an **answer key with justification/explanation** for each MCQ.
7. Ensure **confidentiality and integrity** of the question paper setting process.

Prof. (Dr.) Shrikrishna Mahajan

Dean

Faculty of Commerce and Management
Shivaji University, Kolhapur

**Dean,
Faculty of Commerce & Management,
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MBA Through Online Mode

MBA -I, SEM-II

Sample Question Paper

PAPER-XI OPERATIONS MANAGEMENT

(Q. 1 to 5) Case study - ABC Manufacturing Ltd. is a company specializing in consumer electronics. Over the years, the company has faced several challenges in streamlining its production process. Initially, the company relied on traditional manufacturing methods, but as competition increased, they realized the need for more efficient production management.

To improve efficiency, the company adopted modern operations management techniques, including automation, inventory management, and quality control. They also collaborated with other departments such as marketing, finance, and purchasing to ensure a smooth workflow. Additionally, ABC Manufacturing Ltd. integrated advanced technologies like AI-driven forecasting and computer-based operations research to optimize production schedules and minimize waste.

1. What is the primary goal of production management in a manufacturing company?
 - a) Increasing the number of employees
 - b) Enhancing customer service
 - c) Producing goods efficiently and cost-effectively
 - d) Expanding into international markets
2. Which of the following functional areas does production management closely interact with?
 - a) Only Marketing
 - b) Only Finance
 - c) Finance, Marketing, Purchasing, and R&D
 - d) None of the above
3. How has ABC Manufacturing Ltd. improved its production process?
 - a) By reducing the workforce significantly
 - b) By implementing automation and quality control measures
 - c) By eliminating all manual processes
 - d) By increasing production without considering efficiency

4. What is the role of Operations Research in production management?
 - a) It helps in making strategic decisions using data and mathematical models
 - b) It focuses only on employee motivation
 - c) It replaces the need for marketing strategies
 - d) It is unrelated to production management
5. How can advanced technology benefit production management?
 - a) By increasing inefficiencies in production
 - b) By optimizing production schedules and reducing waste
 - c) By making manual processes more complicated
 - d) By removing the need for skilled labor.

(Q. 6 to 10) Case study - Tesla, a global leader in electric vehicles, operates one of the most advanced manufacturing plants in the world—the Gigafactory. As demand for Tesla vehicles surged, the company faced significant challenges in its assembly line balancing process. Production bottlenecks led to inefficiencies, delays, and increased costs.

To address these challenges, Tesla implemented automation, robotics, and AI-driven assembly line balancing techniques. By redistributing tasks among robotic and human workers, they optimized the production flow, reducing cycle times and minimizing idle time at various stations. The company also integrated real-time data analytics to continuously monitor production speed and workforce efficiency.

As a result, Tesla was able to enhance its production capacity, achieving a record-breaking vehicle output while maintaining high quality standards. However, with increasing automation, Tesla had to retrain its workforce to work alongside AI-driven systems, creating both opportunities and challenges in the production process.

6. What was the main challenge Tesla faced in its assembly line?
 - a) Lack of demand for its vehicles
 - b) Bottlenecks and inefficiencies in production flow
 - c) Overproduction of electric vehicles
 - d) Shortage of raw materials
7. How did Tesla improve its assembly line balancing?
 - a) By increasing the number of workers without automation
 - b) By shutting down production to reorganize workflows

- c) By implementing robotics, automation, and AI-driven balancing techniques
 - d) By reducing production speed to match worker efficiency
8. What is the primary objective of assembly line balancing?
- a) To increase worker fatigue
 - b) To maximize idle time at workstations
 - c) To distribute tasks evenly and optimize production flow
 - d) To reduce the number of workers required
9. Which technological advancement played a key role in Tesla's assembly line improvement?
- a) Blockchain technology
 - b) AI-driven real-time data analytics
 - c) Manual record-keeping
 - d) Traditional craftsmanship techniques
10. What challenge arose from Tesla's increased automation in the assembly line?
- a) Reduced vehicle demand
 - b) Difficulty in maintaining product quality
 - c) The need to retrain workers to adapt to AI-driven systems
 - d) Increased manual labor requirements

(Q. 11 to 15) Case study - Omega Industries, a global leader in precision engineering, faced intense competition from emerging players in the market. Traditional manufacturing methods were no longer sufficient to keep up with fluctuating demand, mass customization, and the need for real-time process monitoring. The company decided to shift to E-Manufacturing—a digitally integrated production system leveraging IoT, AI, cloud computing, and cyber-physical systems.

To begin, Omega implemented smart sensors across its production lines, allowing real-time tracking of machine performance and predictive maintenance. Over time, AI-powered analytics helped reduce material waste and optimize energy consumption. Additionally, by integrating cloud-based digital twins, Omega could simulate different production scenarios before implementation, reducing errors and improving flexibility.

However, the transition was not without challenges. Skilled workers had to be retrained to operate in a data-driven environment, and the initial investment in digital infrastructure was

substantial. Moreover, the choice of manufacturing technology depended on various factors, including scalability, customization needs, and data security.

Despite these challenges, Omega Industries successfully increased efficiency by 30%, reduced downtime by 40%, and improved overall product quality. However, the question remains—will full automation lead to a reduction in workforce requirements, or will it create new job roles requiring specialized skills?

11. What was one of the key drivers behind Omega Industries' transition to E-Manufacturing?
 - a) To replace all human workers with AI
 - b) To address inefficiencies in traditional manufacturing and increase flexibility
 - c) To focus only on increasing production speed without cost considerations
 - d) To return to conventional manual production methods
12. Which technological advancement helped Omega Industries reduce material waste and optimize energy consumption?
 - a) Augmented reality-based training modules
 - b) AI-powered analytics and predictive maintenance
 - c) Blockchain-based payment systems
 - d) Traditional quality inspection techniques
13. What challenge did Omega Industries face in adopting E-Manufacturing?
 - a) Difficulty in acquiring raw materials
 - b) Resistance to automation from customers
 - c) High initial investment and workforce retraining requirements
 - d) Increased time required for product assembly
14. How did cloud-based digital twins contribute to Omega's E-Manufacturing success?
 - a) By enabling real-time production simulations and reducing implementation errors
 - b) By eliminating the need for human decision-making in production
 - c) By increasing the complexity of production management
 - d) By reducing the company's need for cybersecurity
15. What long-term question remains regarding the future of Omega Industries' E-Manufacturing approach?
 - a) Will full automation reduce human workforce requirements or create new specialized roles?

- b) Will the company transition back to traditional manufacturing?
- c) Will AI completely eliminate the need for production planning?
- d) Will Omega abandon smart manufacturing due to excessive costs?

16. Artisan Creations is a company that specializes in handcrafted luxury furniture. Each piece is made according to customer specifications, requiring skilled craftsmanship and unique designs. Due to the high level of customization, the company produces furniture one at a time, ensuring quality and uniqueness.

Which type of production system does Artisan Creations follow?

- a) Mass production
- b) Continuous production
- c) Job production
- d) Batch production

17. Speed Motors operates a large-scale factory where thousands of cars are assembled daily. The production process is highly automated, with vehicles moving through a series of workstations on a conveyor system. Each station completes a specific task before passing the vehicle to the next stage, ensuring a continuous flow of production.

What type of production system is used in Speed Motors' factory?

- a) Job production
- b) Batch production
- c) Mass production
- d) Project production

18. Elite Designs is a luxury fashion boutique that produces exclusive designer clothing. Since trends change frequently and customers demand unique styles, the company manufactures clothes in small batches. Production is not continuous; instead, it happens in cycles based on seasonal demand and custom orders.

Which type of production system does Elite Designs follow?

- a) Continuous production
- b) Intermittent production
- c) Mass production
- d) Assembly line production

19. Pure Refresh Beverages operates a factory that produces bottled soft drinks. The production lines run 24/7, with machines continuously mixing ingredients, filling bottles, and sealing them at high speed. Since demand is high and the process requires minimal variation, the company ensures an uninterrupted flow of production.

Which type of production system does Pure Refresh Beverages follow?

- a) Job production
- b) Batch production
- c) Intermittent production
- d) Continuous production

20. NovaTech Electronics is a company that manufactures high-end consumer gadgets. To stay competitive, the company ensures seamless coordination between different functional areas. The Marketing team analyzes customer trends to suggest new features, while R&D develops innovative designs. The Finance department manages budgeting for raw materials, and the Purchasing team ensures timely procurement. Additionally, the Maintenance team keeps production machinery in optimal condition to prevent delays. Despite this collaboration, occasional misalignment between departments leads to bottlenecks in production.

What is the primary benefit of integrating different functional areas in NovaTech's production system?

- a) It eliminates the need for marketing research
- b) It ensures a smooth production flow and reduces inefficiencies
- c) It allows each department to work independently without coordination
- d) It increases production costs without improving efficiency

(Q.21 to 25) Case study - Alpha Furniture Ltd. is a mid-sized company specializing in wooden furniture. Due to increasing demand, the company has faced challenges in managing its production efficiently. To ensure on-time delivery, cost control, and optimal resource utilization, the company implemented a Production Planning and Control (PPC) system.

The PPC team is responsible for scheduling production, managing raw materials, and ensuring smooth workflow across departments. They use Aggregate Planning to balance demand and

capacity, deciding whether to hire additional workers or increase inventory to meet seasonal demand fluctuations.

With an effective PPC system, Alpha Furniture Ltd. has reduced lead times, minimized waste, and improved customer satisfaction. However, unforeseen supply chain disruptions sometimes create challenges, requiring flexible planning strategies.

21. What is the primary objective of Production Planning and Control (PPC) at Alpha Furniture Ltd.?

- a) To increase production costs
- b) To ensure timely production, cost efficiency, and resource optimization
- c) To focus only on marketing and sales
- d) To eliminate the need for raw materials

22. Which of the following is a key function of PPC?

- a) Advertising and promotions
- b) Production scheduling and inventory management
- c) Customer service and sales negotiations
- d) Employee payroll processing

23. What is Aggregate Planning used for in PPC?

- a) To create detailed engineering designs
- b) To balance demand and capacity over a given period
- c) To eliminate seasonal fluctuations in customer demand
- d) To track employee attendance

24. How did PPC improve operations at Alpha Furniture Ltd.?

- a) By increasing production delays
- b) By reducing lead times, minimizing waste, and improving efficiency
- c) By making production unpredictable
- d) By focusing only on short-term planning

25. What challenge does Alpha Furniture Ltd. still face in its PPC process?

- a) Overproduction of goods with no market demand
- b) Unforeseen supply chain disruptions
- c) Lack of customer interest in their products
- d) No need for inventory management

(Q.26 to 30) Titan Auto Parts is a company that manufactures and supplies engine components to automobile manufacturers. As demand increased, the company faced challenges in scheduling production efficiently, leading to delays, excess inventory, and machine downtime. To tackle these issues, Titan implemented a Master Production Schedule (MPS) to plan production based on demand forecasts. However, due to limited machine availability, Facility Loading became a challenge, requiring better resource allocation.

Additionally, the company faced sequencing problems, where urgent orders sometimes had to wait due to pre-scheduled lower-priority tasks. To solve this, Titan introduced priority planning techniques, ensuring that high-demand components were scheduled first.

To improve Production Control, Titan adopted Control Techniques such as real-time monitoring and feedback systems. These changes reduced production bottlenecks, improved efficiency, and optimized scheduling. However, occasional machine breakdowns and fluctuating demand still pose challenges.

26. What was the primary reason Titan Auto Parts faced production scheduling issues?

- a) Lack of demand for products
- b) Inefficient scheduling leading to delays and excess inventory
- c) Overuse of manual labor
- d) Elimination of production control techniques

27. How did the Master Production Schedule (MPS) help Titan Auto Parts?

- a) It helped forecast demand and plan production accordingly
- b) It eliminated the need for facility loading
- c) It removed the need for scheduling altogether
- d) It only focused on reducing costs without improving efficiency

28. Which production scheduling issue required Titan to improve its priority planning?

- a) Frequent power outages in the factory
- b) Inefficiencies in inventory management
- c) Sequencing problems where urgent orders were delayed
- d) Lack of interest in product development

29. What role did Production Control techniques play in Titan Auto Parts' improvement?

- a) They helped in real-time monitoring and reducing bottlenecks
- b) They increased production delays
- c) They focused only on marketing strategies
- d) They removed the need for scheduling and planning

30. What challenge still remains in Titan Auto Parts' scheduling process?

- a) No competition in the market
- b) Occasional machine breakdowns and fluctuating demand
- c) Excess resources without utilization problems
- d) Elimination of production facilities

(Q.31 to 35) Case study - Titan Motors, a growing automobile manufacturer, needed to set up a new plant to meet increasing production demand. The management had to carefully choose the best location while considering factors like logistics, raw materials, labor availability, and future expansion possibilities. After shortlisting potential locations, they realized that each site had advantages and drawbacks, such as high operational costs in developed areas and transportation issues in remote locations.

Once the location was finalized, Titan Motors focused on plant layout design. They needed a layout that would optimize workflow, reduce material handling time, and improve production efficiency. The management debated between different layouts before selecting the one that best suited their high-volume production needs. However, after implementation, they faced unexpected challenges, requiring adjustments to maintain efficiency.

31. Which key factor should Titan Motors consider while selecting a plant location?

- a) The number of competitors in the area
- b) Availability of skilled labor and logistics infrastructure
- c) The popularity of the city among tourists
- d) The number of office spaces in the region

32. What is one major challenge companies often face when selecting a plant location?

- a) Managing employee social events
- b) Balancing cost, infrastructure, and accessibility
- c) Finding a location near company headquarters
- d) Deciding the brand color of the factory building

33. Which type of plant layout is best suited for high-volume, standardized production?
- a) Process Layout
 - b) Fixed Position Layout
 - c) Product Layout
 - d) Cellular Layout
34. Why is plant layout planning important?
- a) It increases office space for executives
 - b) It ensures better workflow and operational efficiency
 - c) It helps in employee entertainment programs
 - d) It is only required for small-scale businesses
35. What is a common issue that can arise after implementing a plant layout?
- a) No need for inventory management
 - b) Unexpected workflow inefficiencies and bottlenecks
 - c) Complete elimination of logistics costs
 - d) Reduced need for trained labor
36. SmartTech Electronics, a mid-sized company, produces smart home devices. To meet growing demand, they implemented Production Planning and Control (PPC) to schedule production, manage inventory, and reduce waste. However, during peak seasons, they often faced delays due to unexpected machine breakdowns and raw material shortages.
- What is the main purpose of PPC at SmartTech Electronics?
- a) To improve marketing strategies
 - b) To ensure smooth production flow and reduce inefficiencies
 - c) To increase production costs
 - d) To focus only on employee benefits
37. Alpha Furniture manufactures custom wooden furniture. Due to inconsistent order volumes, the company struggled with scheduling, sometimes overproducing and other times failing to meet deadlines. To solve this, they implemented a priority-based scheduling system to balance production according to demand. While this improved efficiency, unexpected rush orders still caused occasional production bottlenecks.
- What method did Alpha Furniture use to improve production scheduling?
- a) Ignoring production issues
 - b) Implementing a priority-based scheduling system
 - c) Reducing production to cut costs
 - d) Relying only on manual tracking

38. TechGear Manufacturing, a company producing electronic gadgets, needed to select a new plant location. The management considered factors such as proximity to suppliers, labor availability, transportation facilities, and government incentives. After careful evaluation, they chose a location near a major industrial hub to ensure easy access to raw materials and skilled workers.

What was a key factor in TechGear Manufacturing's plant location decision?

- a) The availability of skilled labor and transportation facilities
- b) The number of shopping malls nearby
- c) The popularity of the city among tourists
- d) The personal preference of the CEO

39. Stellar Automobiles, an emerging car manufacturer, planned a factory layout to optimize production efficiency. They considered various types of layouts, including process layout, product layout, and fixed-position layout. Since they focused on mass production with an assembly line, they implemented a product layout to ensure smooth workflow and minimal material handling.

Which type of plant layout did Stellar Automobiles choose for mass production?

- a) Process Layout
- b) Product Layout
- c) Fixed-Position Layout
- d) Cellular Layout

40. Green Foods, a packaged food company, designed its new factory layout focusing on workflow efficiency, safety, and space utilization. They ensured that the storage area was close to production units, reducing material handling time. Additionally, proper ventilation and safety measures were included to create a comfortable work environment.

What is one key criterion for a good plant layout in Green Foods' factory?

- a) Efficient workflow and space utilization
- b) Increasing office space for executives
- c) Placing machines randomly without a plan
- d) Expanding the factory without considering worker movement

(Q.41 to 45) Case study - XYZ Manufacturing produces automobile components. Recently, the company faced an increase in customer complaints regarding defective parts. To address this, the company implemented a Total Quality Management (TQM) approach. They

introduced quality checks at each production stage, provided employee training, and encouraged a culture of continuous improvement.

After six months, the defect rate decreased by 40%, and customer satisfaction improved. However, some employees resisted the new process, considering it time-consuming. The management conducted additional training sessions to help them understand the benefits of quality control.

41. What was the main issue faced by XYZ Manufacturing?

- a) Low employee productivity
- b) High customer complaints due to defective parts
- c) High production cost
- d) Delayed delivery

42. Which quality management approach did the company adopt?

- a) Six Sigma
- b) Just-In-Time (JIT)
- c) Total Quality Management (TQM)
- d) Kaizen

43. What was the result of implementing quality checks and training?

- a) Defect rate increased
- b) No change in quality
- c) Defect rate decreased by 40%
- d) Customer complaints increased

44. Why did some employees resist the new quality process?

- a) They thought it was expensive
- b) They found it time-consuming
- c) They lacked technical skills
- d) They preferred outsourcing

45. How did the management handle employee resistance?

- a) Fired the employees
- b) Ignored their concerns
- c) Conducted additional training sessions
- d) Stopped the quality management initiative

(Q. 46 to 50) Case study - ABC Electronics is a mid-sized company that manufactures consumer electronic goods. The company has been growing rapidly, but recently, major clients started demanding proof of standardized quality processes. To stay competitive, the management decided to obtain ISO 9001 certification.

The first challenge was aligning existing processes with ISO standards. A team was formed to analyze quality control measures, document workflows, and implement corrective actions. Some employees questioned the need for so much documentation, but the management explained that it ensures consistent product quality and process improvement.

After six months of effort, ABC Electronics underwent an ISO audit. The auditor found that while most processes met standards, record-keeping needed improvement. The company quickly addressed the issue, and after a follow-up audit, it successfully achieved ISO 9001 certification. Following certification, the company saw a 20% increase in new business inquiries. However, maintaining certification required continuous monitoring and periodic audits, which some managers initially overlooked. The company later introduced internal audits to ensure compliance.

46. Why did ABC Electronics decide to obtain ISO 9001 certification?

- a) To increase production speed
- b) To meet client requirements and improve quality control
- c) To reduce labor costs
- d) To enter a new business segment

47. What was the first challenge faced during ISO certification?

- a) Lack of employee skills
- b) Aligning existing processes with ISO standards
- c) High cost of implementation
- d) Finding a certification body

48. What issue did the auditor find during the initial audit?

- a) Poor product design
- b) Inefficient supply chain
- c) Weak record-keeping
- d) Excessive production waste

49. What was the outcome of achieving ISO 9001 certification?

- a) No significant change

- b) 20% increase in new business inquiries
- c) Increased employee turnover
- d) Reduced production capacity

50. What mistake did some managers make after certification?

- a) Ignoring the importance of continuous monitoring and internal audits
- b) Not hiring new employees
- c) Expanding production too quickly
- d) Reducing product variety

(Q. 51 to 55) Case study - Orion Motors, a leading automobile component manufacturer, faced unexpected machine failures despite following a Preventive Maintenance (PM) schedule. Their production line suffered from delays due to missing critical spare parts, even though their warehouse had an excess stock of less-used components.

To address this, the company adopted a Predictive Maintenance (PdM) system using IoT sensors and AI-based forecasting for spare parts. However, the maintenance team resisted the new system, preferring the old PM method. Additionally, historical inventory data was inaccurate, leading to incorrect demand forecasting for spare parts.

Within six months, PdM reduced breakdowns by 50%, but inventory costs remained high. The company then optimized its Material Requirement Planning (MRP) system, which finally balanced inventory levels and machine uptime. However, managers still had to ensure real-time data accuracy to maintain these improvements.

51. Why did machine failures continue despite following Preventive Maintenance (PM)?

- a) Machines were outdated
- b) Spare parts were not available
- c) PM did not accurately predict failures
- d) Maintenance staff lacked skills

52. What was a major reason for spare parts shortages despite excess inventory?

- a) Slow supplier deliveries
- b) Excess stock of less-used components
- c) Increased production demand
- d) Poor warehouse conditions

53. Why did the maintenance team resist Predictive Maintenance (PdM)?
- a) They preferred the familiar PM method
 - b) PdM required expensive equipment
 - c) Management did not explain PdM properly
 - d) It led to an increased workload
54. What additional step helped control inventory costs?
- a) Increasing storage capacity
 - b) Using bulk purchasing
 - c) Optimizing the Material Requirement Planning (MRP) system
 - d) Reducing maintenance frequency
55. What challenge remained even after PdM and MRP improvements?
- a) Ensuring real-time data accuracy
 - b) Supplier reliability issues
 - c) High maintenance staff turnover
 - d) Overuse of spare parts
56. A textile factory introduced a final inspection process to check fabric quality before shipping. Despite using random sampling, some defective products still reached customers, leading to complaints. The management considered shifting to in-process inspections to catch defects earlier.
- What improvement could help reduce defective products reaching customers?
- a) Increase batch size for final inspection
 - b) Shift to in-process inspections
 - c) Reduce the number of inspections
 - d) Focus only on customer feedback
57. A food packaging company faced inconsistent product weights due to machine calibration issues. Operators manually adjusted settings, but variations persisted. The company decided to implement Statistical Process Control (SPC) to monitor production trends and maintain consistency.
- Which method can help the company maintain consistent product quality?
- a) Rely on manual adjustments
 - b) Ignore minor weight variations
 - c) Implement Statistical Process Control (SPC)
 - d) Increase production speed

58. A steel plant experienced unexpected breakdowns despite following a Preventive Maintenance (PM) schedule. A root cause analysis showed that certain critical components degraded faster than expected due to extreme operational conditions. The maintenance team debated whether to increase PM frequency, implement Predictive Maintenance (PdM), or stockpile extra spare parts to avoid disruptions.

What is the most effective long-term solution to prevent unexpected failures?

- a) Increase the frequency of Preventive Maintenance (PM)
 - b) Shift to Predictive Maintenance (PdM) for critical components
 - c) Stockpile extra spare parts for immediate replacement
 - d) Reduce machine operating hours
59. A manufacturing firm struggled with frequent stockouts of high-demand raw materials, causing production delays, while low-demand items piled up in inventory. The company used historical purchase data for restocking, but it failed to match real-time demand fluctuations. Management debated whether to adopt a Just-In-Time (JIT) approach, upgrade its ERP system, or increase safety stock levels.

Which strategy would best optimize inventory levels without increasing storage costs?

- a) Increase safety stock levels for all materials
 - b) Upgrade to an advanced ERP system with demand forecasting
 - c) Reduce overall inventory to cut costs
 - d) Place bulk orders to avoid shortages
60. A leading electronics manufacturer adopted Total Quality Management (TQM) to enhance product reliability and customer satisfaction. The company encouraged employee involvement, root cause analysis, and continuous process improvements. However, some senior employees resisted the new culture, believing that existing quality checks were sufficient. This led to inconsistent adoption of TQM principles across departments, affecting overall quality gains.

What is the best approach to ensure successful implementation of TQM?

- a) Enforce strict compliance with TQM rules
- b) Focus only on final product inspections
- c) Provide continuous training and emphasize employee involvement
- d) Reduce employee participation in quality decisions

(Q. 61 to 65) Nova Manufacturing, a leading automotive parts supplier, faced increasing production costs and delays in raw material deliveries. The company's new Purchase Manager, Mr. Arjun, was responsible for optimizing procurement, reducing costs, and ensuring a smooth supply chain. Upon reviewing supplier contracts, he noticed that some vendors had long lead times and inconsistent quality standards. Additionally, poor coordination between purchase, production, and inventory teams led to either excess stock or material shortages.

To resolve these issues, Arjun:

- a. Negotiated better pricing and delivery terms with key suppliers.
- b. Implemented a Vendor Rating System to evaluate supplier performance.
- c. Introduced a Just-In-Time (JIT) procurement model for fast-moving materials.
- d. Strengthened internal coordination between departments to align purchases with real-time demand.

After six months, material shortages dropped by 40%, and procurement costs decreased by 15%. However, he still faced challenges in handling fluctuations in raw material prices and ensuring long-term supplier reliability.

61. What was the primary issue Nova Manufacturing faced before the new Purchase Manager took charge?

- a) High labor costs
- b) Delays in raw material deliveries and rising production costs
- c) Lack of skilled employees
- d) Poor product design

62. Which strategy did Arjun implement to evaluate supplier performance?

- a) Increased order quantity
- b) Vendor Rating System
- c) Random supplier selection
- d) Reduced the number of suppliers

63. How did Arjun improve material availability while reducing excess inventory?

- a) Increased safety stock levels for all materials
- b) Implemented a Just-In-Time (JIT) procurement model
- c) Outsourced the purchasing process
- d) Purchased materials in bulk

64. What was one key improvement achieved after six months of implementing changes?

- a) Material shortages dropped by 40%
- b) Labor efficiency increased by 50%
- c) Supplier base was reduced to one vendor
- d) Marketing costs were reduced

65. What challenge did the Purchase Manager continue to face?

- a) Managing fluctuations in raw material prices and ensuring supplier reliability
- b) Increasing workforce size
- c) Reducing the variety of raw materials used
- d) Expanding the supplier base without any criteria

(Q.66 to 70) Case study - Vega Industries, a manufacturer of industrial components, faced persistent issues in its store management system. Frequent stock mismatches led to unexpected material shortages, delaying production schedules. A store audit revealed that manual inventory tracking was prone to human error, and materials were stored without proper categorization, making retrieval time-consuming. Additionally, slow-moving items occupied prime storage locations, while critical fast-moving parts were difficult to access.

To resolve these issues, the Store Manager implemented a Warehouse Management System (WMS) with barcode tracking and restructured storage based on material usage frequency. After six months, stock accuracy improved by 35%, and retrieval times were reduced by 40%. However, the company still struggled with supplier lead time variability and ensuring real-time stock updates.

66. What was the primary issue affecting store management at Vega Industries?

- a) Overstocking of raw materials
- b) Frequent stock mismatches causing material shortages
- c) Lack of trained warehouse workers
- d) High employee turnover in the store department

67. Why did inventory records often show incorrect stock levels?

- a) Materials were stolen frequently
- b) Manual inventory tracking led to human errors

- c) Suppliers did not provide accurate data
- d) Too many employees handled stock records

68. What mistake in material storage made retrieval inefficient?

- a) Storing fast-moving items in hard-to-reach locations
- b) Keeping all items in a single large storage area
- c) Placing all critical items in a separate building
- d) Frequently changing item storage locations

69. Which solution helped improve stock accuracy at Vega Industries?

- a) Implementing a Warehouse Management System (WMS) with barcode tracking
- b) Hiring additional store staff to monitor stock manually
- c) Reducing the number of suppliers
- d) Limiting store access to only senior managers

70. ☐ What challenge remained even after improvements in store management?

- a) Variability in supplier lead times and real-time stock updates
- b) Lack of warehouse space for future expansion
- c) High cost of maintaining barcode scanners
- d) Reduced demand for stored materials

(Q. 71 to 75) Case study - Zenith Auto Parts, a supplier of precision automotive components, faced serious inventory management challenges. Despite having an advanced ERP system, the company frequently encountered stock shortages for high-demand parts while simultaneously holding excess stock of slow-moving items. This imbalance led to production delays, higher holding costs, and cash flow issues.

A detailed analysis revealed that, Demand forecasting was based on outdated historical data, failing to account for recent market trends, the reorder points were fixed and did not adjust dynamically, causing overstocking of some items and shortages of others, Safety stock levels were set too high for low-demand items, taking up valuable warehouse space, the purchasing team relied too much on bulk ordering discounts, leading to excessive inventory for certain materials.

To tackle these issues, the Inventory Manager implemented an AI-based demand forecasting system and introduced a dynamic reorder point mechanism. While these changes improved stock accuracy, the company still struggled with supplier lead time fluctuations and real-time inventory tracking during sudden demand spikes.

71. What was the main problem faced by Zenith Auto Parts in inventory management?
- a) Too many suppliers causing confusion
 - b) Frequent stock shortages and excess inventory at the same time
 - c) High employee turnover in the warehouse
 - d) Poor product quality affecting sales
72. Why did the demand forecasting system fail initially?
- a) It was based only on outdated historical data
 - b) It relied too much on real-time demand signals
 - c) It used AI-based predictive analytics from the beginning
 - d) It focused only on safety stock levels
73. How did fixed reorder points contribute to inventory issues?
- a) They automatically adjusted to demand fluctuations
 - b) They led to overstocking of some items and shortages of others
 - c) They reduced overall holding costs
 - d) They ensured perfect inventory control
74. What key solution was implemented to improve inventory management?
- a) Increasing safety stock levels for all items
 - b) Using an AI-based demand forecasting system and dynamic reorder points
 - c) Reducing the number of suppliers to only one
 - d) Stopping bulk purchases completely
75. What challenge remained even after the improvements?
- a) Supplier lead time fluctuations and real-time tracking issues during demand spikes
 - b) Lack of storage space for excess inventory
 - c) Employees resisting the new AI system
 - d) Overstocking of all materials
76. Precision Electronics faced frequent delays in material retrieval due to a poorly planned store layout. High-demand components were stored far from the assembly line, while rarely used items occupied easily accessible locations. This inefficiency led to longer production lead times and increased labor efforts. To resolve this, the Store Manager redesigned the layout by placing frequently used materials near workstations and organizing shelves systematically.

What was the key issue caused by the poor store layout at Precision Electronics?

- a) Overstocking of raw materials

- b) Delays in material retrieval and production inefficiencies
- c) Shortage of skilled store staff
- d) Excessive purchasing of unnecessary items

77. A pharmaceutical company used a Fixed Order Quantity system to restock critical raw materials. However, fluctuating demand caused frequent stockouts for fast-moving drugs and excess inventory for slow-moving ones. The company considered switching to a Periodic Review System to review stock at fixed intervals and adjust orders accordingly.

Which issue did the company face with the Fixed Order Quantity system?

- a) Excess inventory and frequent stockouts due to demand fluctuations
- b) Inability to track supplier performance
- c) Overuse of warehouse space
- d) Lack of trained staff for inventory management

78. A retail chain applied ABC Analysis to optimize inventory costs. Category A items (high-value, low-quantity) were tightly controlled, while Category C items (low-value, high-quantity) had minimal monitoring. However, a high-value item (Category A) was frequently misplaced, causing unexpected shortages. The company realized that while ABC analysis is useful, it requires strong tracking mechanisms for critical items.

What weakness did the company discover in its ABC analysis approach?

- a) Lack of control over high-value items, leading to stock shortages
- b) Misclassification of items based on sales volume
- c) Overstocking of all items
- d) Excessive storage costs for Category C items

79. A hospital used ABC Analysis for managing medical inventory but faced problems with life-saving drugs and critical surgical tools. Some high-cost equipment was classified as Category A, but low-cost but critical medicines (like emergency injections) were ignored under Category C. Realizing this flaw, the hospital introduced VED Analysis (Vital, Essential, Desirable) to ensure life-saving items were always in stock, regardless of cost.

Why did the hospital need to implement VED Analysis alongside ABC Analysis?

- a) To prioritize critical medical supplies over cost-based classification
- b) To reduce overall inventory costs

- c) To focus only on expensive medical equipment
- d) To eliminate stock monitoring of non-critical medicines

80. A defense manufacturing unit implemented VED Analysis to manage spare parts for its aircraft fleet. Vital components were stocked in large quantities, but fluctuating demand made forecasting difficult. Some Essential parts faced stockouts, while Desirable parts were overstocked due to misjudged demand patterns. The company struggled to balance cost efficiency and operational readiness.

What was a major challenge in using VED Analysis for spare parts management?

- a) Difficulty in demand forecasting for essential components
- b) Overstocking of all items equally
- c) Eliminating the need for a reorder system
- d) Ignoring supplier lead times

Answer Key

1. c) Producing goods efficiently and cost-effectively
2. c) Finance, Marketing, Purchasing, and R&D
3. b) By implementing automation and quality control measures
4. a) It helps in making strategic decisions using data and mathematical models
5. b) By optimizing production schedules and reducing waste
6. b) Bottlenecks and inefficiencies in production flow
7. c) By implementing robotics, automation, and AI-driven balancing techniques
8. c) To distribute tasks evenly and optimize production flow
9. b) AI-driven real-time data analytics
10. c) The need to retrain workers to adapt to AI-driven systems
11. b) To address inefficiencies in traditional manufacturing and increase flexibility
12. b) AI-powered analytics and predictive maintenance
13. c) High initial investment and workforce retraining requirements

14. a) By enabling real-time production simulations and reducing implementation errors
15. a) Will full automation reduce human workforce requirements or create new specialized roles?
16. c) Job production
17. c) Mass production
18. b) Intermittent production
19. d) Continuous production
20. b) It ensures a smooth production flow and reduces inefficiencies
21. b) To ensure timely production, cost efficiency, and resource optimization
22. b) Production scheduling and inventory management
23. b) To balance demand and capacity over a given period
24. b) By reducing lead times, minimizing waste, and improving efficiency
25. b) Unforeseen supply chain disruptions
26. b) Inefficient scheduling leading to delays and excess inventory
27. a) It helped forecast demand and plan production accordingly
28. c) Sequencing problems where urgent orders were delayed
29. a) They helped in real-time monitoring and reducing bottlenecks
30. b) Occasional machine breakdowns and fluctuating demand
31. b) Availability of skilled labor and logistics infrastructure
32. b) Balancing cost, infrastructure, and accessibility
33. c) Product Layout
34. b) It ensures better workflow and operational efficiency
35. b) Unexpected workflow inefficiencies and bottlenecks
36. b) To ensure smooth production flow and reduce inefficiencies
37. b) Implementing a priority-based scheduling system
38. a) The availability of skilled labor and transportation facilities
39. b) Product Layout
40. a) Efficient workflow and space utilization
41. b) High customer complaints due to defective parts
42. c) Total Quality Management (TQM)
43. c) Defect rate decreased by 40%
44. b) They found it time-consuming
45. c) Conducted additional training sessions
46. b) To meet client requirements and improve quality control

- 47. b) Aligning existing processes with ISO standards
- 48. c) Weak record-keeping
- 49. b) 20% increase in new business inquiries
- 50. a) Ignoring the importance of continuous monitoring and internal audits
- 51. c) PM did not accurately predict failures
- 52. b) Excess stock of less-used components
- 53. a) They preferred the familiar PM method
- 54. c) Optimizing the Material Requirement Planning (MRP) system
- 55. a) Ensuring real-time data accuracy
- 56. b) Shift to in-process inspections
- 57. c) Implement Statistical Process Control (SPC)
- 58. b) Shift to Predictive Maintenance (PdM) for critical components
- 59. b) Upgrade to an advanced ERP system with demand forecasting
- 60. c) Provide continuous training and emphasize employee involvement
- 61. b) Delays in raw material deliveries and rising production costs
- 62. b) Vendor Rating System
- 63. b) Implemented a Just-In-Time (JIT) procurement model
- 64. a) Material shortages dropped by 40%
- 65. a) Managing fluctuations in raw material prices and ensuring supplier reliability
- 66. b) Frequent stock mismatches causing material shortages
- 67. b) Manual inventory tracking led to human errors
- 68. a) Storing fast-moving items in hard-to-reach locations
- 69. a) Implementing a Warehouse Management System (WMS) with barcode tracking
- 70. a) Variability in supplier lead times and real-time stock updates
- 71. b) Frequent stock shortages and excess inventory at the same time
- 72. a) It was based only on outdated historical data
- 73. b) They led to overstocking of some items and shortages of others
- 74. b) Using an AI-based demand forecasting system and dynamic reorder points
- 75. a) Supplier lead time fluctuations and real-time tracking issues during demand spikes
- 76. b) Delays in material retrieval and production inefficiencies
- 77. a) Excess inventory and frequent stockouts due to demand fluctuations
- 78. a) Lack of control over high-value items, leading to stock shortages
- 79. a) To prioritize critical medical supplies over cost-based classification
- 80. a) Difficulty in demand forecasting for essential components



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CENTRE FOR DISTANCE AND ONLINE EDUCATION

ONLINE MBA ASSIGNMENT QUESTIONS

- NOTE -**
- 1. EACH SUBJECT HAS 20 MARKS ASSIGNMENTS.**
 - 2. EACH QUESTION CARRIES 10 MARKS AND STUDENTS NEED TO SOLVE ANY TWO OUT OF 3 QUESTIONS.**
 - 3. Students are supposed to write assignments on assignment page/long book page in their own hand writing.**
 - 4. Minimum back to back 3-page answer expected is to be written by the students to get good marks.**
 - 5. The Students should write each subject's assignment separately (ex. For management philosophy write question and answers and upload it in respective subject's assignment submission tab)**
 - 6. These Assignment Questions should be considered for backlog students also.**
 - 7. The submission after 31/05/2026 will not be accepted under any circumstances.**

ONLINE MBA PART-I SEM-I

PAPER I - Management Philosophy

1. Write a brief note on scope of management. Explain the Scientific Management Approach.
2. What is the nature of planning? Write the principles of planning.
3. Write short notes on any two:
 - a. Philosophy of Wealth Management
 - b. Importance of Corporate Governance
 - c. Areas of CSR

PAPER II - Management Accounting

1. What is Accounting? Explain its Concepts and Conventions in detail.
2. What are the Functions of a Finance Manager?
3. Write Short Notes on (Any Two)
 - a. Uses of Financial Statements
 - b. Scope of Cost Accounting
 - c. Break Even Point (BEP)

PAPER III - Business Statistics and Analytics for Decision Making

Q. 1 Write a note on Measures of Dispersion.

Q. 2 Calculate spearman's rank correlation coefficient from the following data:

X	8	10	7	15	3	20	21	5	10	14	8	16	23	19	6
Y	3	12	8	13	20	9	14	11	4	16	15	10	18	23	25

Q.3 Write a note on Testing of Hypothesis.

PAPER IV - Managerial Economics

Q.1 Define Economics and Managerial economics. Write down its Nature, Scope and significance in Business Decisions

Q.2 What is the production function? Explain it in Short run and Long run Production function

Q.3 Write short note (Any two)

- a. Perfect Competition - Features -Price and Output Determination
- b. Factors affecting on Pricing of Products and Services

- c. Price Discrimination - Dumping Prices- Peak Load Pricing method

PAPER V - Computer applications for business

1. Explain the steps to insert and resize images and shapes in MS-Word.
2. Describe the process of starting a basic slideshow and navigating between slides in MS- PowerPoint.
3. WRITE SHORT NOTE (ANY TWO)
 - A. Basic Math Operators in Excel (Sum, Subtract, Multiply, Divide)
 - B. Find and Replace Feature
 - C. Font Styles: Bold, Italic, Underline, and Color

PAPER VI - Managerial Skills for Effectiveness

1. Explain in detail Meaning and Importance of Business Communication.
2. What are the Types of Business Letters?
3. Write Short Notes on (Write any Two)
 - a. Essential Management Skills
 - b. Conflict Management
 - c. Techniques of Effective Communication

PAPER VII - Organizational Behavior

1. Approaches to the study of Organizational Behavior
2. Explain in detail the Resistance to Change
3. Write Short Notes on (Write any Two)
 - a. Herzberg's Two - Factor Theory
 - b. Types of Value
 - c. Difference between Power & Authority



Estd:1962

NAAC “A+ +” Grade with CGPA 3.52

**SHIVAJI UNIVERSITY, KOLHAPUR
CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)**

Programme Project Report (PPR)

of

M.Sc. Mathematics through Online Mode

A. Programme’s mission and objectives:

- 1) To develop employable abilities of the learner where mathematics plays important role.
- 2) To motivate distance education M.Sc. (Mathematics) learner to take higher education.
- 3) To inspire learner to undertake research activity in Mathematics.
- 4) To make learners enough competent in basic functionalities.

B. Relevance of the program with CDOE’s Mission and Goals:

CDOE’s Mission and Goals:

Vision: Imparting Quality Higher Education across the Globe.

Mission: Serving the learners by offering digital learning without time and boundary restrictions.

Goals: Access to Higher Education to

- All segments of the Society across the globe.
- Offer high quality, innovative, career oriented programme to all aspirants.
- All professionals having aspiration of Career advancement are served irrespective of geographical boundaries.

With,

- Quality e-content developed by experts.
- Live Discussion Forums.
- 24 x 7 assistance through dedicated Learning Management System.
- Mentoring facilities provided to cater the needs of the learners.

By these Vision, Mission and Goals, CDOE on the global platforms; are providing the PG programmes to every aspirants of higher education.

C. Nature of prospective target group of learners:

In the post globalization period, there is a huge requirement of manpower having M.Sc. (Mathematics) degree to cater to the needs of manufacturing and service organizations. Further, the manpower which is already employed in manufacturing and service organizations, not having M.Sc. (Mathematics) degree are required to upgrade their qualification by possessing M.Sc. (Mathematics) degree without hampering their service/ working time.

Some graduates, primary teacher, high-school teacher already in service and they want to higher qualification than current qualification for success in their life and this is due only through Online Mode.

D. Appropriateness of programme to be conducted in online mode to acquire specific skills and competence:

Specific Skills and Competence to be achieved by every learner through this Online Mode programme are enlisted follows-

To prepare a young generation of Teachers, Bank staff, government officers who are:

1. Aware of the need of working systematically
2. Aware of the scientific and technological developments.
3. Capable of performing their work backed with theoretical and conceptual clarity.
4. Capable of solving problems and taking appropriate decisions.

E. Instructional Design:

Title of the course: M. Sc. (Mathematics) (Online Mode)

- 1) M.Sc.(Mathematics) Programme has semester pattern
- 2) Duration of the Program
 - The M.Sc. programme will be a full-time two years **online mode** i.e. 4 semesters. Pattern of examination will be Semester System.

Medium of Instruction

- The medium of Instruction will be English only.

Admission Procedure

Eligibility: 1. B.A / B. Sc graduate with Mathematics as specialization subject.
2. B.A. /B. Sc II with one subject Mathematics

3) Structure of the course

The following table gives the scheme of Examination at M.Sc. Mathematics (Part I) according to the New Syllabus and pattern of Examination.

Fees to be paid while registering for the first time for the First Year in accordance with NEP 2020 (Sem.- I & Sem.- II) in June / July :

Sr. No.	Details	Amount (in Rs.)
1.	Registration Fee	2000
2.	Exam Fee	1810
3.	Eligibility fee	As per circular of Qualification department
4.	Alumni associate fee	50
5.	Dhwaj Nidhi	10
6.	Cost of Application form	10
7.	Prospectus charges	20
8.	E-Facility Fee	50
9.	Student welfare fund	100
10.	Youth hostel fee	50
11.	Tuition / Course Fee	30000
12.	Student Accident / Medical Help Fund fee	20
	Total Amount	34,120

Fees to be paid while registering for the first time for the Second Year in accordance with NEP 2020 (Sem.- III & Sem.- IV) in June / July :

Sr. No.	Details	Amount (in Rs.)
1.	Registration Fee	2000
2.	Exam Fee	1810
3.	Eligibility fee	As per circular of Qualification department
4.	Alumni associate fee	50
5.	Dhwaj Nidhi	10
6.	Cost of Application form	10
7.	Prospectus charges	20
8.	E-Facility Fee	50
9.	Student welfare fund	100
10.	Youth hostel fee	50
11.	Tuition / Course Fee	30000
12.	Student Accident / Medical Help Fund fee	20
	Total Amount	34,120

M.Sc.(Mathematics) part I Semester - I

Course Code	Title of course	Number of Credits	Duration of Semester end Exam in hrs.	Marks- Term end Exam	Marks- (Internal) Mid Semester Exam	Total marks of Each Subject
MMT-101	Mandatory Major 4 credits Linear Algebra	4	3	60	40	100
MMT-102	Real Analysis	4	3	60	40	100
MMT-103	Ordinary Differential Equations	4	3	60	40	100
MMT-104	Mandatory Major 2 Credits Numerical Analysis-I	2	2	30	20	50
MET-105	Mandatory Elective (any one) 4 credits Combinatorics or Linear programming and its applications	4	3	60	40	100
RM-106	Mandatory 4 credits Research Methodology	4	3	60	40	100

M.Sc.(Mathematics) part I Semester - II

Course Code	Title of course	Number of Credits	Duration of Semester end Exam in hrs.	Marks-Term end Exam	Marks-(Internal) Mid Semester Exam	Total marks of Each Subject
MMT-201	Mandatory Major 4 credits Algebra	4	3	60	40	100
MMT-202	Topology	4	3	60	40	100
MMT-203	Advanced Calculus	4	3	60	40	100
MMT-204	Mandatory Major 2 Credits Numerical Analysis - II	2	2	30	20	50
MET-205	Mandatory Elective (any one) 4 credits Number Theory or Quantitative techniques in operations Research	4	3	60	40	100
OJT-206	Mandatory 4 credits On job Training / Field project	4	3	60	40	100

M.Sc.(Mathematics) part II Semester - III

Course Code	Title of course	Number of Credits	Duration of Semester end Exam in hrs.	Marks- Term end Exam	Marks- (Internal) Mid Semester Exam	Total marks of Each Subject
MMT-301	Mandatory Major 4 credits Functional Analysis	4	3	60	40	100
MMT-302	Complex Analysis	4	3	60	40	100
MMT-303	Classical Mechanics	4	3	60	40	100
MMT-304	Mandatory Major 2 Credits Advanced Discrete Mathematics	2	2	30	20	50
MET-305	Mandatory Elective (any one) 4 credits Fuzzy Set Theory or Fluid Dynamics	4	3	60	40	100
RP-306	Mandatory 4 credits Research Project	4	3	60	40	100

M.Sc.(Mathematics) part I Semester - II

Course Code	Title of course	Number of Credits	Duration of Semester end Exam in hrs.	Marks- Term end Exam	Marks- (Internal) Mid Semester Exam	Total marks of Each Subject
MMT-401	Mandatory Major 4 credits Integral Equations	4	3	60	40	100
MMT-402	Field Theory	4	3	60	40	100
MMT-403	Partial Differential Equations	4	3	60	40	100
MET-404	Mandatory Elective (any one) 4 credits Fuzzy Relation and Logic Or Computational Fluid Dynamics	4	3	60	40	100
RP-405	Mandatory 6 credit Research Project	6	3	100	50	150

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)
(Introduced from Academic Year 2025-26)

Title of Course: Linear Algebra

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. understand basic notions in Linear Algebra and use the results in developing advanced mathematics.
2. study the properties of Vector Spaces, Linear Transformations, Algebra of Linear Transformations and Inner product space in some details.
3. construct Canonical forms and Bilinear forms.
4. apply knowledge of Vector space, Linear Transformations, Canonical Forms and Bilinear Transformations.

Unit I: Elementary Basic concepts, Linear Independence and Bases, Dual Spaces, Annihilator of a subspace, Quotient Spaces. Inner product spaces, Linear Transformations.

15 Lectures

Unit II: The Algebra of Linear transformations, Characteristic Roots, Matrices of linear transformations, Eigen values and eigenvectors of a linear transformation, Canonical Forms: Similarity of linear transformations.

15 Lectures

Unit III: Triangular form, Nilpotent transformations, Jordan Form, Trace and transpose, Determinants.

15 Lectures

Unit IV: Hermitian, Unitary and Normal linear transformations, Bilinear Forms, Symmetric Bilinear Forms, Skew Symmetric Bilinear Forms.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Book(s):

1. Herstein I. N. : Topics in Algebra, 2nd Edition, Willey Eastern Limited.
2. Hoffman, Kenneth and Kunze R: Linear Algebra, Prentice Hall of India Private Limited., 1984.

Reference Books:

1. A. R. Rao and P. Bhimashankaran, Linear Algebra, Hidustan Book Agency.
2. Surjit Singh, Linear Algebra, Vikas publishing House (1997).
3. Gilbert Strang: Introduction to Linear Algebra, Wellesley-Cambridge Press

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)
(Introduced from Academic Year 2025-26)

Title of Course: Real Analysis

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. generalize the concept of length of interval.
2. analyze the properties of Lebesgue measurable sets.
3. demonstrate the measurable functions and their properties.
4. understand the concept of Lebesgue integration of measurable functions.
5. characterize Riemann and Lebesgue integrability.
6. prove completeness of L^p Spaces.

UNIT I:

σ -algebra and Borel Sets of Real numbers, Lebesgue Outer Measure, The sigma algebra of Lebesgue measurable sets, Outer and Inner approximation of Lebesgue Measurable Sets, Countable Additivity, Continuity and Borel-Cantelli Lemma. **15 Lectures**

UNIT II:

Nonmeasurable Sets, Lebesgue Measurable Functions: Sums, Product and Composition of Measurable Functions, Sequential Pointwise Limits and Simple Approximation, Littlewood's Three Principles (Statement and importance of Egoroff's Theorem and Lusin's Theorem) **15 Lectures**

UNIT III:

Lebesgue Integral of a Bounded Measurable Function over a Set of Finite Measure, Lebesgue integral of a Measurable Non-negative Function, The General Lebesgue Integral, Characterizations of Riemann and Lebesgue Integrability. **15 Lectures**

UNIT IV:

Lebesgue's Theorem (Statement Only), Functions of Bounded Variations, Jordan's theorem, Absolutely Continuous Functions, Integrating Derivatives: Differentiating Indefinite Integrals, The L^p Spaces: Normed Linear Spaces, The Inequalities of Young, Hölder and Minkowski, The Riesz-Fischer Theorem.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books:

1. H. L. Royden, P.M. Fitzpatrick, Real Analysis, Fourth Edition, PHI Learning Pvt. Ltd., New Delhi, 2010

Reference Books:

1. G. de Barra, Measure Theory and Integration, New Age International (P) Ltd., 1981.
2. I. K. Rana, An Introduction to Measure and Integration, Narosa Book Company, 1997.
3. S. K. Berberian, Measure and Integration, McMillan, New York, 1965.
4. P. K. Jain, V. P. Gupta, Lebesgue measure and Integration, Wiley Easter Limited, 1986.
5. W. Rudin, Principles of Mathematical Analysis, McGraw-Hill Book Co, 1964.
6. P. K. Halmos, Measure Theory, Van Nostrand, 1950.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Ordinary Differential Equations

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. study basic notions in Differential Equations and use the results in developing advanced mathematics.
2. solve problems modeled by linear differential equations.
3. use power series methods to solve differential equations about ordinary points and regular singular points.
4. construct approximate solutions using method of successive approximation.
5. establish uniqueness of solutions.

Unit I : Linear differential equations with constant coefficients: The second order homogeneous equation, initial value problems for second order equations, linear dependence and independence, formula for the Wronskian, the non-homogeneous equations of order two.

15 Lectures

Unit II: The homogeneous equations of order n , initial value problems for the n th order equations, the non-homogeneous equation of n th order. Linear equations with variable coefficients: Initial value problems for the homogeneous equations. Solutions of the homogeneous equations, the Wronskian and linear independence.

15 Lectures

Unit III: Reduction of the order of a homogeneous equation, the non-homogeneous equations, homogeneous equations with analytic coefficients, the Legendre equations. Linear equations with regular singular points: The Euler equations, second order equations with regular singular points.

15 Lectures

Unit IV: The Bessel equation, regular singular points at infinity. Existence and uniqueness of solutions: The method of successive approximations, the Lipschitz condition, convergence of the successive approximation.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended books:

1. E. A. Coddington: An introduction to ordinary differential equations. (2012) Prentice Hall of India Pvt.Ltd. New Delhi.

Reference books:

1. G. Birkoff and G.G.Rota, Ordinary differential equations, John Willey and Sons.
2. G.F. Simmons, Differential Equations with Applications and Historical note, McGraw-Hill, Inc. New York. (1972).
3. E.A. Coddington and Levinson, Theory of ordinary differential equations, McGraw-Hill, New York(1955).
4. E.D. Rainvills, Elementary differential equations, The Macmillan company, New York, (1964).

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)
(Introduced from Academic Year 2025-26)

Title of Course: Numerical Analysis - I

Total Credits: 02

Course Outcomes: Upon successful completion of this course, the student will be able to:

- 1) apply the methods to solve linear and nonlinear equations.
- 2) find numerical integration and analyze error in computation.
- 3) solve differential equations using various numerical methods.
- 4) determine eigen values and eigen vectors of a square matrix.
- 5) construct LU decomposition of a square matrix.

Unit I: Transcendental & polynomial equations: Bisection method, Iteration methods based on First degree equation (Secant method, Regula-Falsi method and Newton-Raphson method). Rate of Convergence, Iterative methods (Birge-Vieta method and Bairstow method).

15 Lectures

Unit II: System of linear algebraic equations and eigen value problems: Matrix factorization methods (Doolittle's method, Crout's method), Iteration methods (Jacobi iteration method, Gauss-Seidel iteration method), convergence analysis of iterative methods, Eigen values and eigenvectors, Gerschgorin theorem, Brauer theorem, Jacobi method for symmetric matrices, Power method.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books:

1. M. K. Jain, S. R. K. Iyengar, R. K. Jain, Numerical methods for scientific and Engineering Computation (Fifth Edition), New Age International Publishers 2007.

Reference Books:

1. S. S. Sastry, Introductory methods of Numerical Analysis (Fifth Edition), PHI learning Private Limited, New Delhi 2012.
2. D. Kincaid, W. Cheney, Numerical Analysis Mathematics of Scientific Computing (Third Edition), American Mathematical Society.
3. J.C. Butcher, Numerical methods for ordinary differential equations (Second Edition), John Wiley & Sons Ltd, 2008.
4. Kendall E. Atkinson, An Introduction to Numerical Analysis (Second Edition), John Wiley & Sons 1988.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Combinatorics

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. describe Pigeonhole principle and use it to solve problems.
2. use definitions and theorems from memory to construct solutions to problems
3. use Burnside Frobenius Theorem in counting's.
4. use various counting techniques to solve various problems.
5. apply combinatorial ideas to practical problems.
6. improve mathematical verbal communication skills.

Unit I: The sum rule and product rule, permutations and combinations, the Pigeonhole principle, Ramsay numbers, Catalan numbers, sterling numbers. **15 Lectures**

Unit II: Further basic tools, generalized permutations and combinations sequences and selections, the inclusion and exclusion principle, systems of distinct representatives, solved problems derangements and other constrain derangements. **15 Lectures**

Unit III: Combinatorial number theory, the permanent of a matrix, Rook polynomials and Hit polynomials, SDR and coverings, (Sperners theorem and Symmetric chain decomposition, posets and Dilworth's theorem) statements. **15 Lectures**

Unit IV: Generating functions and recurrence relations, ordinary and exponential generating functions, partitions of a positive integer, recurrence relations, algebraic solutions of linear recurrence relations with constant coefficients and solutions of recurrence relations using generating functions. **15 Lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books:

1. V. K. Balkrishnan: Combiactorics, Shaums Outlines Series, Mc Grow Hill Inc.

Reference Books:

1. Richard Brualdi – Introductory Combinatosics North Holland.
2. V. Krishnamurthy: Combinatorics, E. W. Press
3. A. Tucker: Combinatorics, John Wiley & Sons, Inc
4. C. Vasudev, Theory and Problems of Combinatorics, New Age International

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Linear programming and its applications

Total Credits: 04

Course outcomes: Upon successful completion of this course, the student will be able to --

1. Recognize convex sets and convex functions.
2. Calculate maximum and minimum value of a function of several variables.
3. Solve LPP by simplex and dual simplex methods.

Unit – I: General formulation of linear programming problem, Slack and surplus variables, standard form of LPP, Solution of LPP, Feasible solution of LPP, Basic solution, Basic feasible solution, Optimum Basic feasible solution, unbounded solution, Lines and hyperplanes, Convex sets, polyhedron convex set, extreme points of a convex set, convex combination of vectors, convex hull, convex polyhedron, convex function, maxima and minima of functions of several variables. **15 lectures**

Unit -II : Introduction to linear programming problems, fundamental theorem of linear programming, computational procedure of a simplex method, examples. Two phase method, Examples, big M method, disadvantages of big M method over two phase method, problem of degeneracy, Resolution of degeneracy, unbounded solutions, non-existing feasible solutions **15 lectures**

Unit -III : Duality in linear programming, rules for converting any primal into its dual, Duality theorems, fundamental duality theorem, The dual simplex method, Computational procedure of dual simplex method, examples. **15 lectures**

Unit – IV: Integer linear programming: Importance of integer Programming problems, Gomory's all IPP Method, Gomorian slack variable, Construction of Gomory's Constraints, Gomory's cutting plane Algorithm, Computational procedure for the solution of IPP by Gomory's Method, The Branch and Bound method, branch and bound algorithm, concept goal programming, single goal models, multiple goal models, multiple goals with equal priorities, multiple goal with priorities, multiple goals with priorities and weights, formulation of goal programming models, methodology of solution procedure, graphical solution. simplex method applied to GP problems. **15 lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Book: 1 S.D. Sharma: Operations Research, Kedar Nath Ram Noth and co. 15th edition reprint 2009

Reference Books: 1.J.K.Sharma : Operations research

2. Kanti Swarup ,P.K.Gupta and Manmohan : Operations research, S.Chand& Co.

3. Hamady Taha : Operations Research :Mac Millan Co.

4. R.K.Gupta : Operations Research Krishna Prakashan Mandir, Meeru

5. G.Hadley : Linear programming, Oxford and IBH Publishing Co.

6. S.I.Gass : Linear Programming, Mc Graw Hill Book Co

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester I)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Research Methodology

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. understand skill of mathematical writing
2. Understand writing research paper
3. revise the drafts, check the proofs
4. understand the copy copyright issues
5. Type in mathematics using latex

Unit I: Mathematical Writing: What Is a Theorem?, Proofs, The Role of Examples, Definitions, Notation, Words versus Symbols, Displaying Equations, Parallelism, Dos and Don'ts of Mathematical Writing. Writing a Paper: Audience, Organization and Structure, Title, Author List, Date, Abstract, Key Words and Subject Classifications. **15 Lectures**

Unit II: Writing a Paper (Continued...): The Introduction, Review of Literature, Computational Experiments, Tables, Citations, Conclusions, Acknowledgements, Appendix, Reference List, Specifics and Deprecated Practices. Revising a Draft: How to Revise, Examples of Prose, Examples Involving Equations, Examples from My Writing, A Revised Proof, A Draft Article for Improvement. **15 Lectures**

Unit III: Publishing a Paper: Choosing a Journal, Submitting a Manuscript, The Refereeing Process, How to Referee, The Role of the Copy Editor, Checking the Proofs, Copyright Issues, SIAM Journal Article: A case study. Writing and Defending a Thesis: The Purpose of a Thesis, Content, Presentation, The Thesis Defence. **15 Lectures**

Unit IV: Quality indices of research publication: impact factor, H- index, science citation index., Using web for literature review: Google Scholar, Scopus, MathSciNet. Latex –Basic Typesetting of Mathematics, Typesetting Theorems. **15 Lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Book:

1. Higham Nicholas J., Handbook of writing for the mathematical sciences, SIAM, 1961.
1. LATEX Tutorials A Primer, Indian TEX Users Group, Trivandrum, India, 2003 September.<https://www.tug.org/twg/mactex/tutorials/ltxprimer-1.0.pdf>

References:

1. Stegmann J., How to evaluate journal impact factors, Nature, 390(6660), (1997), 550-550.
2. Kaltenborn K. F. and Kuhn K, The journal impact factor as a parameter for the evaluation of researchers and research, Revista Espanola de Enfermedades Digestivas, 96(7), (2004), 460-476.
3. Hirsch J. E., An index to quantify an individual's scientific research output, <https://arxiv.org/abs/physics/0508025>
4. Garfield E., The evolution of the Science Citation Index, International Microbiology, 10, (2007), 65-69. DOI: 10.2436/20.1501.01.10
5. A Primer of Mathematical Writing, Steven G. Krantz, Universities Press Hyderabad 1998.<https://arxiv.org/pdf/1612.04888.pdf> 6McGraw- Hill's Concise Guide to Writing Research Papers, Carol Ellison, McGraw-Hill, New York, 2010.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester II)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Algebra

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. study group theory and ring theory in some details.
2. introduce and discuss module structure over a ring.
3. apply Sylow theorems.
4. use homomorphism and isomorphism theorems.
5. check irreducibility of polynomials over $\mathbb{Q}$ using Eisenstein criteria.

Unit I: Group of permutations, Examples, Alternating Groups, Simple groups, simplicity of A_n ($n > 4$), Applications, Subnormal and Normal Series, Jordan-Holder Theorem, The Center and the Ascending Central Series, Isomorphism Theorems.

15 Lectures

Unit II: The Zassenhaus (Butterfly) Lemma, Schreier Theorem, Group action on a set, fixed sets and isotropy subgroups, Orbits, Applications of G-Sets to Counting, Burnside theorem, p-groups, The Sylow Theorems.

15 Lectures

Unit III: Applications of Sylow theorems to p-Groups and the Class equation, Further Applications, Polynomial in an Indeterminate, Polynomial rings, The evaluation Homomorphisms, Factorization of Polynomials over Fields, The Division Algorithm in $F[x]$, Irreducible Polynomials, Eisenstein criteria, Ideal Structure in $F[x]$, Uniqueness of Factorization in $F[x]$.

15 Lectures

Unit IV: Principal Ideal Domain (PID), Uniqueness of Factorization Domain (UFD), Gauss lemma, Introduction and Definition of Euclidean Domain, Arithmetic in Euclidean Domains. Definitions and Examples of Modules, Direct Sums, Free Modules, sub-modules, Quotient Modules, Homomorphism, Simple Modules.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Book(s):

1. John B. Fraleigh, A first course in Abstract Algebra (Third Edition), Narosa publishing house, New Delhi.
2. C. Musili, Introduction to Rings and Modules (Second Revised Edition), Narosa Publishing house, New Delhi.

Reference Books:

1. Joseph A. Gallian, Contemporary Abstract Algebra (Fourth Edition), Narosa Publishing house, New Delhi.
2. Bhattacharya, Jain and Nagpal, Basic Abstract Algebra, 2nd edition, Narosa Publishing House, New Delhi.
3. I. N. Herstein, Topics in Algebra, Vikas Publishing House.
4. N. Jacobson, Basic Algebra, Hind Publishing Corporation, 1984.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester II)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Topology

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. built foundations for future study in analysis, in geometry, and in algebraic topology.
2. introduce the fundamental concepts in topological spaces.
3. acquire demonstrable knowledge of topological spaces, product spaces, and continuous functions on topological spaces.
4. identify compact and connected sets in topological spaces.
5. use Separation and countability axioms, Urysohn lemma, Urysohn metrization.

Unit I: Topological Spaces, Basis and Subbasis for a Topology, The Order Topology, The Product Topology on $X \times Y$, The Subspace Topology. **15 Lectures**

Unit II: Closed Sets, Closure and Interior of a Set, Limit Points, Hausdorff Spaces, Continuity of Functions, Homeomorphisms, The Product Topology, The Metric Topology. **15 Lectures**

Unit III: Connected Spaces, Connected Subspaces of the Real Line, Components and Local Connectedness, Compact Spaces, Compact Subspaces of the Real Line. **15 Lectures**

Unit IV: The Countability Axioms, The Separation Axioms, Normal Spaces, The Urysohn Lemma, The Urysohn Metrization Theorem (Only statement and its importance), The Tietze Extension Theorem (Only statement and its importance). **15 Lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Book:

1. J. R. Munkers, Topology, Second Edition, Pearson Education (Singapore), 2000.

Reference Books:

1. W. J. Pervin, Foundations of General Topology, Academic Press, New York, 1964.
 2. J. L. Kelley, General Topology, Springer-Verlag, New York, 1955.
 3. S. Willard, General Topology, Addison-Wesley Publishing Company, 1970.
 4. K. D. Joshi, Introduction to General Topology, New Age International, 1983.
- G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw Hill Book Company, New Delhi, 1963.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester II)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Advanced Calculus

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

- (i) Analyze convergence of sequences and series, double sequences and double series
- (ii) Analyze convergence of sequences and series of functions
- (iii) check differentiability of functions of several variables
- (iv) Apply inverse and implicit function theorems for functions of several variables

Unit I : Sequences and series of functions: Pointwise convergence of sequences of functions, Examples of sequences of real valued functions, Definition of uniform convergence, Uniform convergence and continuity, Cauchy condition for uniform convergence, Uniform convergence and Riemann integration, Uniform convergence and differentiation

15 Lectures

Unit II: Rearrangement of series, subseries, Double sequences, Double series, rearrangement of double series, sufficient condition for equality of iterated series, multiplication of series, Cesaro summability, sufficient conditions for uniform convergence of series, uniform convergence and double sequences, mean convergence, Taylor series generated by a function, Bernstein's theorem, binomial series.

15 Lectures

Unit III: Multivariable differential Calculus: The Directional derivatives, directional derivatives and continuity, total derivative, total derivatives expressed in terms of partial derivatives, The matrix of linear function, mean value theorem for differentiable functions, A sufficient condition for differentiability, sufficient condition for equality of mixed partial derivatives, Taylor's formula for functions from $\mathbb{R}^n$ to $\mathbb{R}^1$

15 Lectures

Unit IV: Implicit functions: Functions of several variables, Linear transformations, Differentiation, Contraction principle, The inverse function theorem, The implicit function theorem and their applications.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended books:

1. Mathematical Analysis, Apostol, Second Edition, Narosa Publishing House.1974

Reference books:

1. Principles of mathematical Analysis, Walter Rudin, third Edition, McGraw Hill book company
2. Calculus Vol. I , Vol II, Tom M. Apostol, Second Edition Wiley India Pvt. Ltd.
3. W.Fleming, Functions of several Variables, 2nd Edition ,Springer Verlag, 1977.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester II)
(NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Numerical Analysis - II

Total Credits: 02

Course Outcomes: Upon successful completion of this course, the student will be able to:

- 1) apply the methods to solve linear and nonlinear equations.
- 2) find numerical integration and analyze error in computation.
- 3) solve differential equations using various numerical methods.
- 4) determine eigen values and eigen vectors of a square matrix.
- 5) construct LU decomposition of a square matrix.

Unit I: Interpolation, differentiation and integration: Lagrange and Newton interpolations, Truncation error bounds, Newtons divided difference interpolation, finite difference operators, numerical differentiation, methods based on interpolation, numerical integration, methods based on interpolation, error analysis, Newton-Cotes methods, Error estimates for trapezoidal and Simpson's rule.

15 Lectures

Unit II: Numerical solution of differential equations: Euler method, analysis of Euler method, Backward Euler method, mid-point method, order of a method, Taylor series method, Explicit Runge-Kutta methods of order two and four, convergence and stability of numerical methods, Truncation error, error analysis.

15 Lectures

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books:

1. M. K. Jain, S. R. K. Iyengar, R. K. Jain, Numerical methods for scientific and Engineering Computation (Fifth Edition), New Age International Publishers 2007.

Reference Books:

1. S. S. Sastry, Introductory methods of Numerical Analysis (Fifth Edition), PHI learning Private Limited, New Delhi 2012.
2. D. Kincaid, W. Cheney, Numerical Analysis Mathematics of Scientific Computing (Third Edition), American Mathematical Society.
3. J.C. Butcher, Numerical methods for ordinary differential equations (Second Edition), John Wiley & Sons Ltd, 2008.
4. Kendall E. Atkinson, An Introduction to Numerical Analysis (Second Edition), John Wiley & Sons 1988.

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0) (Semester II)
(NEP-2020)
(Introduced from Academic Year 2025-26)
Title of Course: Number Theory
Total Credits: 04

Course Outcome:- Upon successful completion of this course, the student will be able to:-

1. learn more advanced properties of primes and pseudo primes.
2. apply Mobius Inversion formula to number theoretic functions.
3. explore basic idea of cryptography.
4. understand concept of primitive roots and index of an integer relative to a given primitive root.
5. derive Quadratic reciprocity law and its apply to solve quadratic congruences.

Unit I: Review of divisibility: The division algorithm, G.C.D., Euclidean algorithm, Diophantine equation $ax + by = c$. Primes and their distribution : Fundamental theorem of Arithmetic, The Goldbach Conjecture. **15 Lectures**

Unit II : Congruences : Properties of Congruences, Linear congruences, Special divisibility tests. Fermat's theorem : Fermat's factorization method, Little theorem, Wilsons theorem. Number theoretic functions : The functions τ and σ . The Mobius Inversion formula, The greatest integer function. **15 Lectures**

Unit III: Euler's Generalization of Fermat's theorem: Euler's phi function, Euler's theorem, properties of phi function, An application to Cryptography. Primitive roots : The order of an integer modulo n . **15 Lectures**

Unit IV: Primitive roots for primes, composite numbers having primitive roots, The theory of Indices. The Quadratic reciprocity law: Eulerian criteria, the Legendre symbol and its properties, quadratic reciprocity, quadratic reciprocity with composite moduli . **15 Lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books :

1. D.M.Burton : Elementary Number Theory, Seventh Ed. MacGraw Hill Education(India) Edition 2012, Chennai.

Reference Books :

1. S.B.Malik : Basic Number theory, Vikas publishing House.
2. George E. Andrews : Number Theory, Hindustan Pub. Corp.(1972).
3. Niven, Zuckerman : An Introduction to Theory of Numbers. John Wiley & Sons.
4. S. G. Telang , Number Theory, Tata Mc.Graw-Hill Publishing Co., New Delhi.
5. M.B. Nathanson, Methods in Number Theory, Springer(2009).

M. Sc. Mathematics (Online Mode) (Part I) (Level-6.0)
(Semester II) (NEP-2020)

(Introduced from Academic Year 2025-26)

Title of Course: Quantitative techniques in operations Research

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Decide policy for replacement.
2. Calculate economic lot size.
3. Derive Poisson distribution theorem and compute attributes of distribution model.
4. Identify optimal path by using CPM and PERT.

Unit I: Replacement Problems: Introduction, Failure mechanism of items, Replacement policy for items whose maintenance cost increases with time and money values is constant, Money value, Present worth factor and discount rate, Replacement policy for items whose maintenance cost increases with time and money values changes with constant rate, Individual replacement policy: Mortality theorem, Group replacement policy.

15 lectures

Unit – II : Inventory – Introduction, Cost involved in inventory problems, variables in inventory problem, symbols in inventory, concept of Economic Ordering Quantity (EOQ), The EOQ models without shortage: Model I (a) The economic lot size system with uniform demand. Model I (b) Economic lot size with different rates of demand in different cycles. Model I (c) Economic lot size with finite Rate of Replenishment. (EOQ production model), EOQ model with shortages: Model II (a) The EOQ with constant rate of demand, scheduling time constant, Model II (c) The production lot size model with shortages. Probabilistic inventory Models, Instantaneous demand, no set up cost model Model VI (a) Discrete case Model VI (b) continuous case, Problems on above models. **15 lectures**

Unit – III : Queuing Theory - Queuing systems, Queuing Problems: transient and steady states, A list of symbols, traffic intensity, Probability distributions in Queuing systems: Distribution of arrivals 'The Poisson process', Properties of Poisson process of arrivals, Distribution of inter-arrival times (Exponential process). Distribution of Departures (Pure death model), Analogy of exponential service time with Poisson Arrivals Model I : (M/M/1) : (/FCFS): Birth and Death model, Solution of model, Examples on model I, Problems. **15 lectures**

Unit – IV: PERT / CPM : Applications of PERT / CPM techniques, Network diagram representation. Rules for constructing the Network diagram, Time estimates and critical path in network analysis, Examples on optimum duration and minimum duration cost, Problems **15 lectures**

Seminars, Tutorials, Problem solving session and group discussions on above four units

Recommended Books:

1. S.D.Sharma : Operations Research Kedarnath and co. 1999

Reference Books:

1. Hamdy Taha : Operations Research, Macmillan and Co.
2. J.K. Sharma : Operations Research, Macmillan India Ltd. 1999.
3. R.K.Gupta : Operations research Time estimates h, Krishna Prakashan Mandir, 1999

M.Sc. Mathematics (Distance Mode) (Part I) (Level-6.5) (SemesterII) (NEP-2020)
(Introduced from Academic Year 2025-26)

Title of Course: On job Training / Field project

Total Credits: 04

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (SemesterIII) (NEP-2020)
(Introduced from Academic Year 2026-27)

Title of Course: Functional Analysis

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. understand the fundamental topics, principles and methods of functional analysis.
2. demonstrate the knowledge of normed spaces, Banach spaces, Hilbert space.
3. define continuous linear transformations between linear spaces, bounded linear functionals.
4. apply finite dimensional spectral theorem.
5. identify normal, self adjoint, unitary, normal operators.

UNIT– I : Normed linear spaces, Banach spaces, quotient spaces, continuous linear transformations, equivalent norms, finite dimensional normed spaces and properties, conjugate space and separability, The Hahn-Banach theorem and its consequences.

15 Lectures

UNIT –II: Second conjugate space, the natural embedding of the normed linear space in its second conjugate space, reflexivity of normed spaces, the open mapping theorem, projection on Banach space, the closed graph theorem, the conjugate of an operator, the uniform boundedness principle. **15 Lectures**

UNIT –III: Hilbert spaces: examples and elementary properties, orthogonal complements, the projection theorem, orthogonal sets, the Bessel's inequality, Fourier expansion and Parseval's equation, separable Hilbert spaces, the conjugate of Hilbert space, Riesz's theorem, the adjoint of an operator. **15 Lectures**

UNIT – IV: Self adjoint operators, normal and unitary operators, projections, eigen values and eigenvectors of an operator on a Hilbert space, the determinants and spectrum of an operator, the spectral theorem on a finite dimensional Hilbert space. **15 Lectures**

Recommended Book(s):

G. F. Simmons, Introduction to Topology and Modern Analysis, Tata McGraw Hill, 1963.

Reference Books:

1. Erwin Kreyszig, Introductory Functional Analysis with Applications, John Wiley and Sons, 1978.

2. A. E. Taylor, Introduction to Functional analysis, John Wiley and sons, 1958.
3. J. B. Conway, A course in Functional Analysis, Springer-Verlag, 1985.
4. G. Bachman and L. Narici, Functional Analysis, Academic Press, 1972.
5. B. V. Limaye, Functioned Analysis, New age international, 1996.

**M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester III) (NEP-2020)
(Introduced from Academic Year 2026-27)**

Title of Course: COMPLEX ANALYSIS

Total Credits: 04

Course outcomes: to enable the student to

1. understand fundamental concepts of complex analysis.
2. identify analytic functions, Conformal maps.
3. construct Taylor and Laurent series.
4. classify singularity and apply Residue Theorem to evaluate real integrals.
5. enjoy the beauty of analytic functions and related concepts.

Unit 1: Power series, Radius of convergence, analytic functions, Cauchy-Riemann equations, Harmonic functions, Conformal mappings, Mobius Transformations, line integral. **15 Lectures**

Unit 2: Power series representation of analytic functions, zeros of an analytic function, Liouville's Theorem, Fundamental theorem of algebra, maximum modulus theorem, the index of a closed curve, Cauchy's theorem and integral formula, Morera's Theorem. **15 Lectures**

Unit 3: Counting zeros, open Mapping theorem, Goursat's Theorem, classification of singularities, Laurent series development, Casorati-Weierstrass theorem, residues, residue theorem, evaluation of real integrals. **15 Lectures**

Unit 4: The argument principle, Rouché's theorem, the maximum principle, Schwarz's lemma and its application to characterize conformal maps, Riemann mapping theorem. **15 Lectures**

Recommended Book :

1. J. B. Conway: Functions of One Complex Variable (3rd Edition) Narosa Publishing House.

References :

1. S. Ponnusamy, Foundations of Complex Analysis, Narosa Publishing House.
2. Alfors L. V.: Complex Analysis, McGraw 1979.
3. Churchill and Brown, Complex Variables and applications, MacGrawHill(India). (8th Edition, 2014)
4. Serge Lang, Complex Analysis, Springer
5. Steven G. Krantz, Complex Analysis, A Geometric view Point, The Carus Mathematical Monographs.
6. T. W. Gamelin, Complex Analysis, Springer.

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester III) (NEP-2020)
(Introduced from Academic Year 2026-27)

Title of Course: CLASSICAL MECHANICS

Total Credits: 04

Course outcomes: to enable the student to

1. discuss the motion of system of particles using Lagrangian and Hamiltonian approach.
2. solve extremization problems using variational calculus.
3. discuss the motion of rigid body.
4. construct Hamiltonian using Routh process. use infinitesimal and finite rotations to analyze motion of rigid body.

UNIT – I: Mechanics of a particle, Mechanics of a system of particles, conservation theorems, constraints, Generalized coordinates, D’Alembert’s Principle, Lagrange’s equations of motion, Simple applications of Lagrangian formulation, Cyclic co-ordinates and generalised momentum, conservation theorems. **15 Lectures**

UNIT – II: Functionals, basic lemma in calculus of variations, Euler- Lagrange’s equations, first integrals of Euler- Lagrange’s equations, Geodesics in a plane and space, the minimum surface of revolution, the case of several dependent variables . **15 Lectures**
Undetermined end conditions, the problem of Brachistochrone, Isoperimetric problems, problem of maximum enclosed area. Hamilton’s Principle, Derivation of Hamilton’s principle from D’Alembert’s principle, Lagrange’s equations from Hamilton’s principle. Lagrange’s equations of motion for nonconservative systems (Method of Lagrange’s undetermined multipliers)

UNIT – III: Hamiltonian function, Hamilton’s canonical equations of motion, cyclic co-ordinates and Routh’s procedure, Derivation of Hamilton’s equations from variational principle, Physical significance of Hamiltonian, The principle of least action. Orthogonal transformations, Properties of transformation matrix, infinitesimal rotations. **15 Lectures**

UNIT – IV: The Kinematics of rigid body motion: The independent co-ordinates of a rigid body, the Eulerian angles, Euler’s theorem on motion of rigid body, Angular momentum and kinetic energy of a rigid body with one point fixed, the inertia tensor and moment of inertia, Euler’s equations of motion, Cayley- Klein parameters, Matrix of transformation in Cayley- Klein parameters, Relations between Eulerian angles and Cayley- Klein parameters. **15 Lectures**

Recommended Books :

- 1) Goldstein, H. Classical Mechanics. (1980), Narosa Publishing House, New Delhi.
- 2) Weinstock: Calculus of Variations with Applications to Physics and Engineering (International Series in Pure and Applied Mathematics). (1952), Mc Graw Hill Book Company, New York. **Reference Books :-** 1) Whittaker, E. T. A Treatise on the Analytical Dynamics of Particles and Rigid Bodies. (1965), Cambridge University Press.
- 3) Gupta, A. S. Calculus of Variations with Applications (1997), Prentice Hall of India.
- 4) Gelfand, I. M. and Fomin, S. V. Calculus of Variations (1963), Prentice Hall of India. Rana, N.C. and Joag, P. S. Classical Mechanics. (1991) Tata McGraw Hill, New Delhi

**M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester III) (NEP-2020)
(Introduced from Academic Year 2026-27)**

**Title of Course: Advanced Discrete Mathematics
Total Credits: 02**

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. classify the graphs and apply to real world problems.
2. simplify the graphs using matrix.
3. simplify the Boolean identities and apply to switching circuits.
4. learn applications of discrete mathematics including lattices and Boolean Algebra.

UNIT– I : Graph: Definition, examples, isomorphism, simple graph, bipartite graph, complete bipartite graph, vertex degrees, regular graph, sub-graphs, complement of a graph, self complementary graph, paths and cycles in a graph, the matrix representation of a graph. Definition and simple properties of a tree, Bridges. **15**

Lectures

UNIT –II: Posets: Definition, examples, Hasse diagrams of posets, supremum and infimum, isomorphic ordered sets, duality. Lattices: Definition, examples, sublattices. Ideals: Definition, examples, bounded lattices, distributive lattices, modular lattices, complemented lattices, Boolean algebra, basic definitions, basic theorems, Boolean algebras as lattices, CNF, DNF, applications of Boolean algebra to switching circuit. **15**

Lectures

Recommended Book(s):

1. John Clark and Derek Holton, A first look at Graph Theory, Allied Publishers Ltd., 1991.
2. G. Gratzner, General Lattice Theory, Birkhauser, 2002.
3. J. Eldon Whitesitt, Boolean Algebra and Its Applications, Addison-Wesley Publishing Company, Inc., 1961.

Reference Books:

1. Seymour Lipschutz and Mark Lipson, Discrete Mathematics (second edition) Tata Mc Graw Hill Publishing Company Ltd. New Delhi.
2. Garrett Birkhoff: Lattice Theory, American mathematical society, 1940

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (SemesterIII) (NEP-2020)
(Introduced from Academic Year 2026-27)

Title of Course: FUZZY SET THEORY

Total Credits: 04

Course outcomes: to enable the student to Course Outcomes:-

1. acquire the knowledge of notion of crisp sets and fuzzy sets,
2. understand the basic concepts of crisp set and fuzzy set,
3. develop the skill of operation on fuzzy sets and fuzzy arithmetic,
4. demonstrate the techniques of fuzzy sets and fuzzy numbers.
5. apply the notion of fuzzy set, fuzzy number in various problems.

Unit I: Fuzzy sets and crisp sets, examples of fuzzy sets, types of fuzzy sets, standard operations, cardinality, degree of subset hood, level cuts and its properties, representation of fuzzy sets, decomposition theorems, extension principle, properties of direct and inverse images of fuzzy sets. **15 Lectures**

Unit II: Operations on fuzzy sets, types of operations, fuzzy complement, equilibrium and dual point, Increasing and decreasing generators, fuzzy intersection: t-norms.

15 Lectures

Unit III: Fuzzy union t-conorms, characterization theorem of t-conorm, combination of operators, aggregation operations, ordered weighted averaging operations. **15 Lectures**

Unit IV: Fuzzy numbers, characterization theorem, linguistic variables, arithmetic operations on intervals, arithmetic operations on fuzzy numbers, lattice of fuzzy numbers, fuzzy equations. **15 Lectures**

Unit V: Examples, seminars, group discussions on above four units. **15 Lectures**

Recommended Books:

1. George J. Klir, Bo Yuan, Fuzzy sets and Fuzzy Logic. Theory and Applications, PHI, Ltd.2000

Reference Books:-

1. M.Grabish, Sugeno, and Murofushi Fuzzy Measures and Integrals: Theory and Applications, PHI, 1999.
2. H.J.Zimmerermann, Fuzzy Set Theory and its Applications, Kluwer, 1984.
3. M. Hanss, Applied Fuzzy Arithmetic, An Introduction with EngineeringApplications, Springer- Verlag Berlin Heidelberg 2005.
4. M. Ganesh, Introduction to Fuzzy Sets & Fuzzy Logic; PHI Learning Private Limited, New Delhi 2011.
Bojadev and M. Bojadev, Fuzzy Logic and Application, World Scientific Publication Pvt.Ltd. 2007.

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (SemesterIII) (NEP-2020)
(Introduced from Academic Year 2026-27)
Title of Course: FLUID DYNAMICS

Total Credits: 04

Course outcomes: to enable the student to Course Outcomes:-

- 1) explain physical properties of fluids.
- 2) represent general motion of fluid element.
- 3) test possible fluid flows, classify rotational and irrotational fluid flows .
- 4) transform stress components from one co-ordinate system to another, establish relation between strain and stress tensor..
- 5) develop constitutive equations for Newtonian fluids, conservation laws and Navier-Stokes equation.
- 6) determine the complex potential and images of a two dimensional source, sink and doublet.

Unit I: Physical properties of fluids and kinematics of fluids: Concepts of fluids, continuum hypothesis, density, specific weight, specific volume, pressure, viscosity, surface tension, Eulerian & Lagrangian methods of description of fluids, Equivalence in Eulerian and Lagrangian methods, General motion of a fluid element, Integrability and compatibility conditions, general orthogonal curvilinear co-ordinate system, stream lines, path lines, streak lines, stream function, vortex lines, circulation, condition at rigid boundary. **15 Lectures**

Unit II: Stresses in fluids: Strain rate tensor, stress tensor, normal stress, shearing stress, symmetry of stress tensor, Transformation of stress components from one co-ordinate system to another, principle axes and principle values of stress tensor. Newtonian fluids, non Newtonian fluids, purely viscous fluids, Constitutive equations for Newtonian fluids. **15 Lectures**

Unit III. Conservation laws: Equation of conservation of mass, equation of conservation of momentum, Navier-Stokes equation, equation of moment of momentum, Equation of energy, Basic equations in different co-ordinate systems: Cartesian co-ordinate system, Cylindrical co-ordinate system, Spherical co-ordinate system, boundary conditions. **15 Lectures**

Unit IV. Rotational and irrotational flows:Theorems about rotational and irrotational flows: Kelvins minimum energy theorem, Kinetic energy of finite and an infinite fluid, uniqueness of irrotational flows, Bernoullis's equation, Bernoullis equation for irrotational flows, Two dimensional irrotational incompressible flows, Blasius theorem, circle theorem, Sources and sinks, sources, sinks and doublets in two dimensional flows, Methods of images. **15 Lectures**

Recommended Books:

- a. R. K. Rathy, An introduction to Fluid Dynamics, Oxford & IBH publishing company.
- b. F. Chorlton, Text book of Fluid Dynamics, CHS Publishers, Delhi, 1985.

Reference Books:

1. L. D. Landay and E. M. Lipschitz, Fluid Mechanics, Pergamon Press London 1985.
2. Kundu and Cohen, Fluid Mechanics, Elsevier pub. 2004.
3. L M Milne-Thomson, Theoretical Hydrodynamics, Macmillan Education Ltd, London 1986.

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester III) (NEP-2020)
(Introduced from Academic Year 2026-27)
Title of Course: Research Project
Total Credits: 04

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)
(Introduced from Academic Year 2026-27)
Title of Course: INTEGRAL EQUATIONS
Total Credits: 04

Course outcomes: to enable the student to Course Outcomes:-

1. classify the linear integral equations and demonstrate the techniques of converting the initial and boundary value problem to integral equations and vice versa.
2. develop the technique to solve the Fredholm integral equations with separable kernel.
3. develop and demonstrate the technique of solving integral equations by successive approximations, using Laplace and Fourier transforms
4. to analyze the properties of symmetric kernel.
5. to prove Hilbert Schmidt Theorem and solve the integral equation by applying it.

UNIT– I Classification of linear integral equations, conversion of initial value problem to Volterra integral equation, conversion of boundary value problem to Fredholm integral equation, separable kernel, Fredholm integral equation with separable kernel, Fredholm alternative. Homogeneous Fredholm equations and eigen functions.

15 Lectures

UNIT –II Solutions of Fredholm integral equations by: Successive approximations method, successive substitution method, Adomian decomposition method, modified decomposition method, resolvent kernel of Fredholm equations and its properties, solutions of Volterra integral equations, successive approximations method, Neumann series, successive substitution method. **15 Lectures**

UNIT –III Solution of Volterra integral equations by Adomian decomposition method and the modified decomposition method, resolvent kernel of Volterra equations and its properties, convolution type kernels, applications of Laplace and Fourier transforms to solutions of Volterra integral equations, symmetric kernels, fundamental properties of eigen values and eigen functions for symmetric kernels, expansion in eigen functions and bilinear form. **15 Lectures**

UNIT – IV Hilbert Schmidt Theorem and its consequences, solution of symmetric integral equations, operator method in the theory of integral equations, solution of Volterra and Fredholm integro-differential equations by Adomian decomposition method. Green's function: Definition, construction of Green's function and its use in solving boundary value problems. **15 Lectures**

Recommended Books:

1. R. P. Kanwal, Linear Integral Equation: Theory and Technique, Birkhauser 2012.
2. Abdul-Majid Wazwaz, Linear and Nonlinear Integral Equations-Methods and Applications, Springer, 2011

Reference Books:

1. L. G. Chambers, Integral Equations- A Short Course, International Text Book Company, 1976.
2. M. A. Krasnov, et.al. Problems and exercises in Integral equations, Mir Publishers, 1971.
3. J. A. Cochran, The Analysis of Linear Integral Equations, Mc Graw Hill Publications, 1972.
4. C. D. Green, Integral Equation Methods, Thomas Nelson and sons, 1969.

**M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)
(Introduced from Academic Year 2026-27)**

Title of Course: FIELD THEORY

Total Credits: 04

Course outcomes: to enable the student to

- 1) determine the basis and degree of a field over its subfield.
- 2) construct splitting field for the given polynomial over the given field.
- 3) find primitive n^{th} roots of unity and n^{th} cyclotomic polynomial.
- 4) make use of Fundamental Theorem of Galois Theory and Fundamental Theorem of Algebra to solve problems in Algebra.
- 5) apply Galois Theory to constructions with straight edge and compass.

UNIT-I: Algebraic Extensions of fields Adjunction of roots, Algebraic extensions, Algebraically closed fields. **15 Lectures**

UNIT-II: Normal and Separable extensions Splitting fields, Normal extensions, Multiple roots, Finite fields, Separable extensions. **15 Lectures**

UNIT-III: Galois Theory Automorphism groups and fixed fields, Fundamental theorem of Galois theory, Fundamental theorem of algebra, Roots of unity and cyclotomic polynomials, Cyclic extensions. **15 Lectures**

UNIT-IV: Applications of Galois theory Polynomials solvable by radicals, Symmetric functions, Constructions by ruler and compass. **15 Lectures**

Recommended Book(s):

1. Bhattacharya, Jain and Nagpal, Basic Abstract Algebra, 2nd edition, Cambridge University Press, UK.(Asian edition) 2005.

Reference Books:

1. Nathan Jacobson, Basic Algebra I, second edition, W. H. Freeman and company, New York
2. I. N. Herstein, Topics in Algebra, Wiley Eastern Ltd.
3. U. M. Swamy, A. V. S. N. Murthy, Algebra: Abstract and Modern, Pearson Education, 2012
4. John Fraleigh, A first course in Abstract Algebra (3rd edition) Narosa publishing house, New Delhi
5. I. T. Adamson, Introduction to Field Theory, second edition, Cambridge University Press, 1982.
6. M. Artin, Algebra, PHI, 1996. Ian Stewart, Galois Theory, CRC Publication.

**M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)
(Introduced from Academic Year 2026-27)**

Title of Course: PARTIAL DIFFERENTIAL EQUATION

Total Credits: 04

Course outcomes: to enable the student to

1. classify partial differential equations and transform into canonical form
2. solve linear partial differential equations of both first and second order.
3. solve boundary value problems for Laplace's equation, the heat equation, the wave equation by separation of variables, in Cartesian, polar, spherical and cylindrical coordinates.
4. apply method of characteristics to find the integral surface of a quasi linear partial differential equations.
5. establish uniqueness of solutions of partial differential equations.

Unit I:

Curves and surfaces, First order Partial Differential Equations, classification of first order partial differential equations, classifications of Integrals, Linear equations of first order. Pfaffian differential equations, Criteria of Integrability of a Pfaffian differential equation. Compatible systems of first order partial differential equations. **15 Lectures**

Unit II:

Charpits method, Jacobi method of solving partial differential equations, Cauchy Problem, Integral surfaces through a given curve for a linear partial differential equations, for a non-linear partial differential equations. Method of characteristics to find the integral surface of a quasi linear partial differential equations. **15 Lectures**

Unit III:

Second order Partial Differential Equations. Origin of Partial differential equation, wave equations, Heat equation. Classification of second order partial differential equation, Vibration of an infinite string (both ends are not fixed), Physical Meaning of the solution of the wave equation. Vibration of a semi infinite string, Vibration of a string of finite length, Method of separation of variables, Uniqueness of solution of wave equation. Heat conduction Problems with finite rod and infinite rod.

15 Lectures

Unit IV:

Families to equipotential surfaces, Laplace equation, Solution of Laplace equation, Laplace equation in polar form, Laplace equation in spherical polar coordinates. Kelvin's inversion theorem. Boundary Value Problems: Dirichlet problems and Neumann problems, Maximum and minimum principles, Stability theorem. Dirichlet Problems and Neumann problems for a circle, for a rectangle and for a upper half plane, Duhamel's Principle. **15 Lectures**

Recommended Book:

1. **T. Amarnath:** An Elementary Course in Partial Differential Equations, 2nd edition, Narosa publishing House(2012).

Reference Books:

1. Mark Pinsky: Partial Differential Equations and Boundary-value Problems with Applications, AMS, 3rd edition(2011).
2. I. N. Sneddon: Elements of Partial Differential Equations, McGraw Hill Int.
3. Fritz John: Partial Differential Equations, Springer(1952).

M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)

(Introduced from Academic Year 2026-27)

Title of Course: FUZZY RELATIONS & LOGIC

Total Credits: 04

Course outcomes: to enable the student to Course Outcomes:-

1. acquire the concept of fuzzy relations.
2. understand the basic concepts of fuzzy logic and fuzzy algebra.
3. develop the skills of solving fuzzy relation equations.
4. construct approximate solutions of fuzzy relation equations. 5.solve problems in Engineering and medicine.

Unit I

Projections and cylindrical extensions, binary fuzzy relations on single set, fuzzy equivalence relations, fuzzy compatibility relations, fuzzy ordering relations, fuzzy morphisms sup-i composition and inf-wi composition. **15 Lectures**

Unit II

Fuzzy relation equations, problem partitioning, solution methods, fuzzy relational equations based on sup-i and inf-wi compositions, approximate solutions. **15 Lectures**

Unit III

Fuzzy propositions, fuzzy quantifiers, linguistic hedges, inference from conditional fuzzy propositions, qualified and quantified propositions. **15 Lectures**

Unit IV

Fuzzy algebra, fuzzy groups and fuzzy rings and their basic properties . **15 Lectures**

Recommended Books:

1. George J Klir, Bo Yuan, Fuzzy Sets and Fuzzy Logic. Theory and applications, PHI.Ltd. (2000)
2. John Mordeson, Fuzzy Mathematics, Springer, 2001

Reference Books:

- 1.M.Grabish, Sugeno, and Murofushi, Fuzzy Measures and Integrals: Theory and Applications PHI, 1999.
2. H.J.Zimmermann, Fuzzy set :Theory and its Applications, Kluwer, 1984.
- 3.M. Ganesh, Introduction to Fuzzy sets & Fuzzy Logic; PHI Learning Private Limited, New Delhi. 2011.

.M.Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)

(Introduced from Academic Year 2026-27)

Title of Course: COMPUTATIONAL FLUID DYNAMICS

Total Credits: 04

1. **Course outcomes: to enable the student to Course Outcomes:-**

2. classify partial differential equations (PDEs) mathematically and physically.
3. apply separation of variables method for solving initial boundary value problems.
4. construct forward, backward and centered difference formulae.
5. test stability, convergence & consistency of finite difference schemes.
6. solve problems in CFD using computer software.

Unit I

Comparison of experimental, theoretical and numerical approaches, governing equations, continuity equation, momentum equation (inviscid, viscous flows) energy equation, incompressible viscous flow, laminar boundary layer flow. Introduction of Scilab to solve problems in CFD. **15 Lectures**

Unit II Nature of a well posed problems, physical classification and mathematical

classification of partial differential equations: hyperbolic, parabolic, elliptic partial differential equations (PDEs). Conversion of PDE to canonical form. Traditional solution method: separation of variables. Transformation relationships, evaluation of transformation parameters. Forward, backward, centered difference formulae, generalized co-ordinates structure of first and second order PDE. **15 Lectures**

UNIT –III:

Stability, convergence and consistency of finite difference scheme, Explicit, Implicit and Crank- Nicolson methods for heat equation, Von Neumann analysis, Euler's explicit method, upstream differencing method, Lax method, Euler implicit method for wave equation. Finite difference representation of Laplace equation, five point method. Problem solving by Scilab: codes of explicit methods for heat and wave equations and five point method for Laplace equation. **15 Lectures**

UNIT – IV:

Finite difference schemes for Burgers equation (inviscid): Lax method, implicit methods. Finite difference schemes for Burgers equation (viscous): FTCS method, Briley – McDonald method. Convergence and stability, grid generation, orthogonal grid generation, order of magnitude analysis, reduced Navier-Stokes equations, boundary layer flow. **15 Lectures**

Recommended Book(s):

1. Dale A Anderson, John Tannehill, R. H. Fletcher, Computational Fluid Mechanics and Heat Transfer, Hemisphere publishing corporation, 1984.
2. G D Smith, Numerical Solution of Partial Differential Equations: Finite Difference Methods, Oxford Applied Mathematics and Computing Science Series, Oxford University Press, 1985.
3. C. A.J. Fletcher, Computational Techniques for Fluid Dynamics Vol. I & II, Springer Verlag Berlin Heidelberg, 1988.

Reference Books:

1. T J Chung, Computational Fluid Dynamics, Cambridge University Press, 2002.

**M. Sc. Mathematics (Distance Mode) (Part II) (Level-6.5) (Semester IV) (NEP-2020)
(Introduced from Academic Year 2024-25)**

Title of Course: Research Project

Total Credits: 06

F. Scheme of Teaching

- 1) Synchronous session as per the scheduled of Online education Shivaji University, Kolhapur.
- 2) e-Content videos.
- 3) Discussion Forum

G. Examination Pattern

Theory:

- **For 4 credit course:**

University examinations shall be of 80 marks and internal examination of 20 marks

- **For 2 credit course:**

University examinations shall be of 40 marks and internal examination of 10 marks

Practical:

Practical evaluation shall be through university appointed panel of one external and one internal examiner.

On Job Training/Field Project:

Assessment criteria of OJT/FP shall be based on final report, presentation and oral examination.

1. Student has to submit final report based on the work carried out during OJT/FP.
2. Student has to make a presentation of the work carried out during OJT/FP in front of examiner panel.
3. Student has to give midterm presentation of the work carried out during OJT/FP.

Research Project:

- **For 4 credit course:**

Assessment criteria of research project shall be based on final report/ dissertation, presentation and oral examinations. University examinations shall be of 80 marks and internal examination of 20 marks.

1. Project viva by university appointed external and internal examiners.
2. Internal evaluation will be carried out by internal guide.

- **For 6 credit course:**

Assessment criteria of research project shall be based on final report/ dissertation, presentation and oral examinations. University examinations shall be of 100 marks and internal examination of 50 marks.

1. Project viva by university appointed external and internal examiners.
2. Internal evaluation will be carried out by internal guide.

Research Methodology:

University examinations shall be of 80 marks and internal examination of 20 marks.

H. Nature of Question Paper and Scheme of Marking: Theory:

(I) Nature of the Theory Question Papers for courses of 4 credits:

1. There shall be 7 questions each carrying 16 marks.
2. Question No.1 is compulsory. It consists of objective type questions.
3. Students have to attempt any four questions from Question No.2 to Question No.7.
4. Question No. 2 to Question No.7 shall consist of short/descriptive-answer type sub-questions.
5. Duration of university theory examination of 80 marks shall be of 3 hours.

(II) Nature of the Theory Question Papers for courses of 2 credits:

1. There shall be 4 questions.
2. Question No.1 is compulsory of objective type questions carrying 8 marks.
3. Students have to attempt any two questions from Question No.2 to Question No.4.
Each question carries 16 marks.
4. Duration of university theory examination of 40 marks shall be of 2 hours.

Practical:

University examinations shall be of 80 marks and internal examination of 20 marks.

- 1) Duration of Practical Examination shall be of 3 hours.
- 2) There shall be three questions out of which any two questions to be attempted and each question carries 25 Marks.
- 3) The final practical examination shall be conducted by the university appointed examiners (External and internal). The pattern of final Practical Examination shall be as follows:

1	Coding and Execution of Program	50 Marks
2	Viva-voce	20 Marks
3	Journal	10 Marks
4	Total	80 Marks

The practical examination will be conducted semester wise in order to maintain the relevance of the respective theory course with laboratory course.

I. Procedure for Admissions, Curriculum Transaction and Evaluation:

Admissions:

Eligibility:

i) Any candidate who has successfully completed B. Sc. with a principal subject Mathematics or with a subsidiary subject Mathematics of this University or of any other statutory University recognized by UGC, New Delhi.

OR

ii) Any candidate who has successfully completed the Bachelor's degree with Mathematics courses at Second Year of Bachelor's degree of this University or of any other statutory University recognized by UGC, New Delhi.

OR

iii) Any candidate who has successfully completed level 5.5 with major or minor subject as Mathematics of this University or of any other statutory University recognized by UGC, New Delhi.

Eligibility for level 6.5:

i) Any candidate who has successfully completed Post Graduate Diploma (Level 6.0) in Mathematics of this University or of any other statutory University recognized by UGC, New Delhi.

OR

ii) Any candidate who has successfully completed Bachelor's Degree (Honours / Honours with Research) (Level 6.0) with principal / major subject Mathematics of this University or of any other statutory University recognized by UGC, New Delhi.

OR

iii) Completed all requirements of the relevant Post Graduate Diploma (Level 6.0) in Mathematics.

J. Intake: No limit

K. Documents Required for the Admission:

- Color scan copy of SSC, HSC and Graduation mark sheets.
- Caste Certificate (If applicable).
- Two identity card size photographs along with its scan copy of 09 KB and Scan signature of the student 09KB.
- TC/MC (whichever applicable). In case of TC/MC is not available at the time of admission student will get provisional admission. Grace period of 30 days will be given to submit the original TC/MC otherwise provisional admission gets cancelled no fee will be refunded.

L. Curriculum Transaction:**Web-based Tools:**

- e-Books
- PDFs
- Video Lectures (Synchronous and Asynchronous Type)
- OERs as per Need of Programme etc.

M. Academic Calendar:

Part- I		
Sr. No.	Programme Events	Months
A.	Admission Process	15 th June, 2025 to 30 th June, 2025
B.	Induction Programme	1 st July, 2025 to 15 th July, 2025
C.	Dissemination of Course Contents and Internal Evaluation (Semester-I)	16 th July, 2025 to 15 th November, 2025
D.	Semester - I Examination	20 th November, 2025 to 30 th November, 2025
E.	Introductory Session (Semester-II)	10 th December, 2025 to 15 th December, 2025
F.	Dissemination of Course Contents and Internal Evaluation (Semester-II)	16 th December, 2025 to 15 th April, 2026
G.	Semester – II Examination	16 th April,2026 to 30 th April,2026

N. Programme Fees:

M.Sc. Mathematics through Online Mode Programme fees; learners have to pay through Internet Banking, Credit Card/ Debit Card (RuPay/Visa/MasterCard/Maestro), Internet Banking, IMPS, Cash Cards/ Mobile Wallets (additional service charges, as per rules, shall be applicable in addition to the application form processing fees). This fee is non-refundable and non-transferable under any circumstances.

₹ 30,000 /- (Excluding exam and other fees)
For 1 year

O. Requirement of the laboratory support and Library Resources:**a. Requirement of the Laboratory Support:**

Nil

b. Requirement of Library Resources:

e-Books, e-journals, Online Subscriptions of Digital Books/ Library etc.

P. Cost estimate of the programme and the provisions:

Sr.	Particulars	Description	Amounts
1	e- Tutorial (Videos / Audios / Presentation, etc.) Required Videos = 864 Videos Required Minutes = 8640	For 10.00 Minutes Video Including Transcript and PPT approved rate is as Rs. 2,000/-	17,28,000/-
2	Development of Question Banks Total 48 Question bank sets * Rs. 500/-	Question paper set comprising of Case studies, Short/Long Answer, MCQs etc.	24,000/-
3	e-Content (SLMs/e-books/manual/Handbooks etc.)	For Unit Writing, Editing, DTP and allied activities	Nil
4	Discussion Forum/ Live Sessions	4 Live Sessions of each course	Nil
5	Employees Salary 1 Programme Co-Ordinator * 36,000/- 4 course Co-Ordinators * 36,000/- 1 mentor * 36,000/-	For Coordinating and Live Sessions	23,76,000/-
6	Digital Marketing	Rs. 3,00,000/- for 3 Months / 3 online courses	1,00,000/-
7	Advertising in Newspaper	Rs. 2,00,000/- / 3 online courses	67,000/-
8	Premiere Pro License	Rs. 80,000/- / 3 online courses	27,000/-
9	Learning Management System (LMS)	Rs. 25,00,000/- / 3 online courses	8,40,000/-
10	Personal Computers	Rs. 60,000/- * 06 Employees	3,60,000/-
	Miscellaneous Expenses		1,50,000/-
		Total Cost	56,72,000/-

Q. Quality assurance mechanism and expected programme outcomes:

After completion of M.Sc. (Mathematics) programme, distance learner can able to,

- 1) Solve any mathematical problem by properly applying mathematical principles.
- 2) Apply their knowledge in their current profession.
- 3) Make their careers in analysis of mathematical data in government and non-government organization.
- 4) Undertake research activity of new simplex methods in Mathematics.



Estd. 1962
"A++" Accredited by
NAAC (2021)
With CGPA 3.52

**SHIVAJI UNIVERSITY, KOLHAPUR - 416004,
MAHARASHTRA**

PHONE:EPABX-2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in

शिवाजी विद्यापीठ, कोल्हापूर - ४१६००४, महाराष्ट्र

दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दूरध्वनी ०२३१-२६०९०९४



Ref./SU/BOS/Com & Mgt./399

Date : 30/06/2025

To,

The Principal/Co-ordinator/Director
All Affiliated (Commerce & Management) Colleges/ Institutions,
Shivaji University, Kolhapur

**Subject :Regarding structure and syllabi of M. Com. Part-I (Sem. I & II) (Online Mode)
degree programme under the Faculty of Commerce & Management as per
National Education Policy, 2020 (NEP 2.0)**

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the University authorities have accepted and granted approval to the structure and syllabi of **M. Com. Part-I (Sem. I & II) (Online Mode)** under the Faculty of Commerce & Management as per National Education Policy, 2020 (NEP 2.0)

This syllabi shall be implemented from the academic **year 2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (Online Syllabus).

You are therefore, requested to bring this to the notice of all Students and Teachers concerned.

Thanking you,

Yours faithfully,

(Dr. S. M. Kubal)
Dy. Registrar

Encl : As above

Copy to,

1. Dean, Faculty of Commerce & Management
2. Chairman, BOS under Faculty of
Commerce & Management
3. Director, BOEE
4. Appointment Section
5. P. G. Admission Section
6. O.E. 1 Section
7. Affiliation Section (U.G./P.G.)
8. Computer Center/I.T.
9. Eligibility Section
10. Distance Education
11. P.G. Seminar Section
12. IQAC Section

for information

for information and necessary action.

SHIVAJI NIVERSITY, KOLHAPUR



ESTD. 1962
NAAC A++ Grade

Faculty of Commerce and Management

Master of Commerce (M. Com.)

Online Mode

(Structure and Syllabus in accordance with
National Education Policy to be implemented
from Academic Year 2025-26)

Shivaji University, Kolhapur
Master of Commerce (M. Com.) Online Mode
Syllabus, Structure, Rules and Regulations (in
accordance with National Education Policy
to be implemented from Academic Year 2025-26)

1. INTRODUCTION:

The stream of commerce education has gained lot of importance in the recent past. Due to globalization trade and aids to trade has not remained in the limited horizon. The facets of trade need to be studied beyond geographical barriers and culture. Therefore, the time has come to think commerce education from the perspective of global education. The domains falling in commerce like accountancy, costing, taxation as well as business administration have importance in every walk of life for an entrepreneur. The whole commerce education itself is an interdisciplinary in nature. Therefore, recent trends in those subjects and their applications in the business world need to be correlated. While restructuring this curriculum as per the National Education Policy 2020, more focus is on practical applications of various concepts being taught under the faculty of commerce and management.

2. PROGRAMME OUTCOMES: PROGRAMME OUTCOMES (POs)

Trained professionals for industry and commerce

PO 1: To acquaint the learners with skills and capabilities to handle managerial and administrative responsibilities

PO 3: To demonstrate the decision-making ability by application of theories in real life business situations

PO 4: To imbibe entrepreneurial temperaments, skills and capabilities among the learners

PO 5: To demonstrate the knowledge of commerce and industry in business applications

PO 6: To acquaint the knowledge of accounting, costing, taxation and administration.

PO 7: To acquaint with conventional and contemporary thoughts, ideas and practices

PROGRAMME SPECIFIC OUTCOMES (PSOs)

- **PSO1:** In depth understanding of core areas of accounting-financial accounting, cost accounting, management accounting, international accounting, investments, security and tax planning, business research methods
- **PSO2:** Application of knowledge in problem solving, decision making
- **PSO3:** Working in teams as well as taking initiative and leadership responsibilities
- **PSO4:** To apply modern tools techniques and methods
- **PSO5:** Applying inter personal communication skills
- **PSO6:** Ability to handle different functional areas of accounting, finance, taxation and administration.

3. DURATION:

The revised guidelines and rules shall be implemented gradually as mentioned below and the duration of the programme has been mentioned below:

Postgraduate Programme:			
Level 6.0	Postgraduate Diploma (One year or two semesters)	M. Com. Part-I	2025-26
Level 6.5	Master's Degree(Two years or four semesters)	M. Com. Part-II	2026-27
Level 6.5	Master's Degree (One year or two semesters after obtaining A four-year Bachelor's Degree (Honours /Research)	M. Com. Part-II	2027-28

(If the candidate wants to exit after a certain level, the Awards after completing specific level will be: Postgraduate Diploma in Commerce and M. Com. for Level- 6.0 and Level-6.5 respectively. Other provisions for multiple entry and exit as per the university's rules and regulations are applicable).

4. ELIGIBILITY FOR ADMISSION:

The candidate completed Three Years B. Com. Degree (or Level-5.5 of NEP framework) will be eligible for Online M. Com. Part-I (Level 6). The candidate completed Four Year B. Com. (Hon./Research) (Level-6) will be eligible for Online M. Com. Part-II (Level 6.5) directly. [The criteria for admission is as per the rules and regulations set from time to time by the university, government and other relevant statutory authorities.]

5. MEDIUM OF INSTRUCTION:

The medium of instruction shall be ENGLISH.

6. Pattern of M. Com. Programme:

Combination of internal assessment and semester-end examination for Online M. Com. will be 80:20 pattern shall be applicable for each theory paper in each semester wherein 80 marks shall be for University Semester-end examination and 20 marks for internal assessment except Project Work and Apprenticeship. In that case Project Work will have 60 marks and Viva-voce will have 40 marks and for Apprenticeship total 150 marks will be their which will be assessed by internal guide and external mentor from industry or community engagement.

7. Weightage:

There shall be Two Year M. Com. Programme with 160 Credits. The candidate wishes to attempt for Four Year B. Com. (Hon./Research) may opt for 4th year which will have 38 credits, hence, Four Year B. Com. Programme will require 198 credits. (Please refer the university regulations and structure of the programme for details).

8. Structure: The Structure of Online M. Com. Programme is given below:
(As per Government of Maharashtra Guidelines GR No. एन ई पी -२०२२/७. ०९/ विं व विं श-३
विं शकाना विं द. १६ मे २०२३)

Year	Level	Sem. (2 Yr)	Major		RM	OJT/ FP	RP	Cum. Credi t
			Mandatory	Electives				
I	6.0	Sem. I	DSC1 (4) DSC2 (4) DSC3 (4) DSC4 (2)	DSE1(4)	RM (4)	-	-	22
			14	04	04	-	-	22
		Sem. II	DSC5 (4) DSC6 (4) DSC7 (4) DSC8 (2)	DSE2 (4)		OJ T (4)		22
			14	04	-	04	-	22
			28	08	04	04	-	44
		Exit Option: Award of P. G. Diploma (44 Credits)						
II	6.5	Sem. III	DSC9 (4) DSC10 (4) DSC11 (4) DSC12 (2)	DSE3 (4)			RP (4)	22
			14	04	-	-	04	22
			DSC5 (4) DSC6 (4) DSC7 (4)	DSE4 (4)			RP (6)	
			12	04	-	-	06	22
			26	08	-	-	10	44
			54	16	04	04	10	88
Award of P. G. Degree (88 Credits) [for 2 year P. G. after 3 year UG programme or one year after 4 year UG programme]								

Online M. Com. Programme Structure for Semester I and II

Semester - I											
Teaching Scheme					Examination Scheme						
Sr. No.	Theory (TH)				Practical (PR)	Semester - end Examination (SEE)			Internal Assessment (IA)		
	Course Type	No. of Lectures per Week	Hours	Credits		Paper Hours	Max	Min	Internal	Max	Min
1	DSC1	4	4	4		3	80	32	--	20	08
2	DSC2	4	4	4		3	80	32	--	20	08
3	DSC3	4	4	4		3	80	32	--	20	08
4	DSC4	2	2	2		2	40	16	--	10	04

5	DSE1	4	4	4	3	80	32	--	20	08
6	RM	4	4	4	3	80	32	--	20	08
Total		22	22	22		440		--	110	
SEE + IA: 440 + 110 = 550										

Semester - II												
Teaching Scheme							Examination Scheme					
Sr. No.	Theory (TH)				Practical (PR)		Semester - end Examination (SEE)			Internal Assessment (IA)		
	Course Type	No. of Lectures	Hours	Credits	Hrs.	Credits	Paper Hours	Max	Min	Internal	Max	Min
1	DSC5	4	4	4	--	--	3	80	32	--	20	08
2	DSC6	4	4	4			3	80	32	--	20	08
3	DSC7	4	4	4			3	80	32	--	20	08
4	DSC8	2	2	2			2	40	16	--	10	04
5	DSE2	4	4	4			3	80	32	--	20	08
6	OJT/FP	-	-	-	4	4	RS*	80	32	VV#	20	08
Total		18	18	18	4	4		440			110	
										SEE + IA: 440 + 110 = 550		
Semester I and II		40	40	40	4	4		880	-	SEE + IA: 880 + 220 = 1100		
Total credits required for completing. M. Com. I: 44 credits												

RS = Report Submission: Certified Submission of Dissertation/OJT

Report/Project Report # VV= Viva-Voce/Presentation

9. List of Courses:

List of Courses for Online M. Com. Part - I (Semester - I & II) is given in the annexure.

10. Scheme of Examination:

The Question paper in each Semester for each theory course (paper) for Online M. Com. (all Semesters) shall be of 80 marks. Total marks for each course shall be based on continuous assessments and semester-end examination. Combination of internal assessment and semester-end examination for M. Com. will be as follows:

Total marks for each course = 100

Internal Assessment = 20

Semester-end Examination = 80

Internal Assessment Process shall be as follows:

(a) The Internal Assessment (for 20 % Marks) shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment process should be conducted

after completing 50% of syllabus of the course/s.

- (b) In case a student has failed to attend for internal assessment through online mode on scheduled date, it shall be deemed that the student has dropped the test. However, in case of student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Programme Coordinator. The Programme coordinator in consultation with the concerned course coordinator shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned Programme Coordinator but before commencement of the concerned semester-end examination.

List of the Courses for Online M. Com. Semester-I and II

Sr. No.	Course Code	Course Category	Title of the Course	Credits
1	MMA-I	Major	Adv. Accountancy Paper-I	4
2	MMA-II	Mandatory	Adv. Accountancy Paper-II (Management Accounting)	4
3	MMA-III		Adv. Accountancy Paper-III (Taxation)	4
4	MMA-IV		Adv. Accountancy Paper-IV (Introduction to Income Tax)	2
5	EBM-I	Elective	Business Management	4
6	EME-I		Managerial Economics	4
7	MRM	Minor	Research Methodology	4
8	MMA-V	Major	Adv. Accountancy Paper-V	4
9	MMA-VI	Mandatory	Adv. Accountancy Paper-VI (Cost Accounting)	4
10	MMA-VII		Adv. Accountancy Paper-VII (Auditing)	4
11	MMA-VIII		Adv. Accountancy Paper-VIII (Introduction to Auditing)	2
12	EBM-II	Elective	Organization Behavior	4
13	EME-II		International Business	4
14	OJT	OJT	On the job training	4

Shivaji University, Kolhapur
Syllabus of Online M. Com.
Faculty of Commerce and Management
Syllabus in accordance with NEP2020
Introduced from Academic Year 2025-26
Online M. Com. – I Semester - I

**Title of Paper-Advanced Accountancy -Paper I
(DSC-1) (MMAI)**

Course Outcomes

After Studying this course, students shall be able to:

1. Understand concept of Accounting Standards and practical implications of AS-1 and AS-2
2. Familiar with preparing final accounts of service industries.
3. Demonstrate preparation of consolidated financial statements of holding company and its subsidiaries.
4. Understand preparation of financial statements of Insurance Companies with Schedules.

Total 60 Hours

4 Credits

Unit	Contents	No. of Hours
I	Introduction to Accounting Standard- Theory- Meaning, Objectives and Need of Accounting Standard, Introduction to IFRSs, Distinction between GAAPs and IFRSs, Disclosure of Accounting Policies (AS-1) and Valuation of Inventories(AS-2) Practical- a)Visit Chartered Accountant's Office and discuss the ideas of accounting standards, IFRSs and GAAPs b) Arrange group discussion or seminar on AS-1and AS-2	15
II	Accounting for Holding Company Theory- Group Accounts with one subsidiary Co.-AS-21(Vertical Form only) Practical Collect consolidated financial statements from the website of any group of companies and arrange group discussion on it.	15
III	Accounting of Life Insurance Companies Theory- Introduction, Accounting forms, Financial Statements with schedules, IRDA Regulations related to financial statements of Life insurance companies. Practical- a) Download financial statements of Life Insurance Co. and discuss on them in the classroom. b) Arrange visit to Life insurance company branch office to know their accounting process	15

IV	Accounting of General Insurance Companies Theory -Introduction, Accounting forms, Financial Statements with schedules, IRDA Regulations related to financial statements of General insurance companies. Practical – a) Download financial statements of General insurance company and discuss on them in the classroom. b) Arrange visit to General insurance company branchoffice to know their accounting process	15
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Reference Books:

- 1) Gupta, S. C.; Gupta, M. P.; Shukla, M. C.; Agrawal, B. M. and Grewal, T. S.(2019). Advanced CorporateAccounting, S. Chand & Company, New Delhi.
- 2) Shukla, M. C.; Grewal, T. S. and Gupta, S. C.; (2016). Advanced Accounts, S.Chand & Company, New Delhi.
- 3) Arulnandan, M. A. and Raman, K. S. (2018). Advanced Accountancy (Corporate Accounting) Vol. II,Himalaya Publishing House, Mumbai.
- 4) Gupta, R. L. andRadhaswamy, M. (2018). Advanced Accountancy Vol. II,Sultan Chand and Sons; New Delhi.
- 5) Maheshwari, S. N.; Maheshwari, Suneel and Maheshwari, Sharad K. (2018).Corporate Accounting. Vikas Publication House, New Delhi.
- 6)Shukla M. C. ; Grewal T.S. and Gupta S.C. - Advanced Accounts; S.Chand and Co. New Delhi.
- 7) Jain, S. P.; Narang, K. L.; Agrawal, Simmi and Sehgal, Monik (2018). Advanced Accountancy (Corporate Accounting) Vol. II, Kalyani Publishers, New Delhi.
- 8) Hanif, M. and Mukharjee, A (2018). Modern Accountancy Vol. II, McGraw HillEducation India (Private) Ltd., Noida.

Suggested Additional Readings: (if web source then provide url)

- 1) Chakraborty, Hrishikesh, Advanced Accountancy, Oxford University Press
- 2) Original documents of Accounting Standards issued by ICAI
- 3) Companies Act 2013

Suggested Research Journal:

- 1) Indian Journal of Accounting
- 2) Indian Journal of Commerce
- 3) The Chartered Accountant
- 4) Management Accountant

	Shivaji University, Kolhapur Nature of Question Paper M.Com. I Semester I (NEP) Advanced Accountancy –Paper I	
Marks: 80	Duration: 3 hours.	
Instructions: 1. Question number 1 and 2 are compulsory. 2. Attempt any three questions from question number 3 to 6 3. Use of Calculator is allowed		
Q. 1 a. Choose the appropriate alternative		(10)
b. True or false		(6)
Q.2 Short Notes (any 4 out of 6)		(16)
Q.3 Practical Problem		(16)
Q.4 practical problem		(16)
Q.5 practical problem		(16)
Q. 6. a. Short problem		(8)
b. Short Problem		(8)

(Theory questions 40% and Practical questions 60%)

Shivaji University, Kolhapur

Syllabus of Online M.Com.

Faculty of Commerce and Management

Syllabus in accordance with NEP 2020

Introduced from Academic Year 2025-26

Online M.Com. – I Semester- I

Title of Paper- Advanced Accountancy Paper II

(Management Accounting)

(DSC-2) (MMA-II)

Course Outcomes:

After Studying this course, students shall be able to:

1. Understand the fundamentals of Management Accounting.
2. Explain the analysis and interpretation of financial statements.
3. Demonstrate the estimation of working capital requirements.
4. Practice to analyze the changes in financial position.

Total 60 Hours

4 Credits

Unit	Contents	No. of Hours
I	Introduction: Theory: Meaning of Management Accounting, Scope and Functions of Management Accounting, Role of Management Accountant in Decision Making, Management Accounting vs. Financial Accounting, Management Accounting vs. Cost Accounting, Tools and Techniques of Management Accounting Practical: Group discussion can be conducted in the classroom on the contents of Unit-I	10
II	Analysis of Financial Statements: Part I Theory: Meaning and Types of Financial Statements, Analysis of financial statements: Comparative Statement Analysis, Common- size Statement Analysis, Trend Analysis Practical: Download financial statements of any company and analyze with any one or more techniques of financial analysis and state your interpretation.	15
III	Analysis of Financial Statements: Part II Theory: Ratio Analysis- Classification of Ratios, Advantages and Limitations of Accounting ratios. Calculation of ratios and Interpretation. Practical: Download financial statements of any company and analyse with the help of ratios and state your interpretation	20

IV	Working Capital: Theory: Meaning, Significance and Determinants of Working Capital, Operating Cycle, Types of Working Capital, Estimation of Working Capital Requirements Practical: Exercise for Simulation of estimation of working capital can be arranged in the classroom	15
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Reference Books:

1. Khan M.Y. and Jain P.K. Management accounting, Tata McGraw Hill,
2. New Delhi
3. Charles T. Horngren, Introduction to management Accounting, Prentice
4. Hall of India, New Delhi.
5. Horngren, Charles T. George Foster and Shrikant M. Daliar : Cost
6. Accounting : A Managerial Emphasis, Prentice Hall, Delhi
7. Pandey I. M. Management Accounting, Vani Publication, Delhi. ‘
8. Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon : Budgeting,
9. Profit Planning and control, Prentice Hall, New Delhi.
10. Manmohan & Goyal : Principles of Management Accounting
11. Maheshwari: Principles of Management Accounting
12. Robet Anthony and Vijay Govindrajan - Management Control System

Shivaji University, Kolhapur Nature of Question Paper M.Com. I Semester I (NEP) Advanced Accountancy Paper II (Management Accounting)	
Marks: 80	Duration: 3 hours.
Instructions: 4. Question number 1 and 2 are compulsory 5. Attempt any three questions from question number 3 to 6 6. Use of Calculator is allowed	
Q. 1 a. Choose the appropriate alternative	(10)
b. True or false	(6)
Q.2 Short Notes (any 4 out of 6)	(16)
Q.3 Practical Problem	(16)
Q.4 practical problem	(16)
Q.5 practical problem	(16)
Q. 6. a. Short problem	(8)
b. Short Problem	(8)

(Theory Questions – 40% and Practical Problems – 60%)

Shivaji University, Kolhapur
Syllabus of Online M. Com.
Faculty of Commerce and Management
Syllabus in accordance with NEP 2020
Introduced from Academic Year 2025-26
Online M. Com. – I Semester- I
Title of Paper - Advanced Accountancy Paper III
(Taxation)
(DSC-3) (MMA-III)

60 hours

4 Credits

Course outcomes

Students will be able to-

- 1) Compute Income from Salary
- 2) Compute Income from Business or Profession and House Property
- 3) Compute Total Income and Tax Liability
- 4) File E- Return and make E – Payment of Tax

	Course Content	
Unit-I:	Income from Salary	(20 hours)
Theory	Exemptions under salary income, valuation of perquisites, Deductions from salaries u/s 16, Computation of Income from Salary considering the exemptions and deductions available under Regular (Old) Tax Regime and Alternative (New) Tax Regime.	
Practical	Collect data from individuals regarding salary income and compute income from salary	
Unit-II:	Income from Business or Profession, Income from House Property, Capital Gains and Income from other Sources (of Individuals only)	(15 hours)
Theory	Computation of income from business or profession and Income from House Property considering the exemptions and deductions available under Regular (Old) Tax Regime and Alternative (New) Tax Regime. Brief information about Capital Gains and Income from other Sources.	
Practical	Collect data from any individual regarding income from business or profession and income from House Property and compute the income.	
Unit-III:	Deductions under Chapter VIA, Computation of Total Income and Tax Liability (of Individuals only)	(15 hours)
Theory	Deductions available to individuals, Computation of Total (Taxable) Income and Tax Liability under Regular (old) Tax Regime and Alternative (New) Tax Regime, when information about two or more sources of income is given	

Practical	Collect data of income from all sources from any individual and compute Total Income and Tax Liability.	
Unit-IV:	Clubbing of Income Set-off and Carry Forward of Losses, E-Filing and E- Payment:	(10 hours)
Theory	Clubbing of Income, Set-off and Carry Forward of Losses, E- Filing of Returns, E- Payment of Tax.	
Practical	Discuss with Tax Consultant regarding e-filing of IT return of any individual.	

Reference Books:

- 1) Singhanian – Student’s Guide to Income Tax
- 2) Prasad Bhagwati – Income Tax Law & Practice
- 3) Mehrotra H.C. – Income Tax Law
- 4) Dinkar Pagare –Income Tax Law and Practice
- 5) Ahuja and Gupta – Systematic Approach to Income Tax

Nature of Question Paper

M.Com. Part-I (Semester-I)

Advanced Accountancy Paper III (Taxation)

Instructions

1. Question No.1, Q. No. 2 and Q. No. 3 are Compulsory.
2. Attempt any Two Questions from Q. No.4 to 6.
3. Use of calculator is allowed

Q.No.1	a) Choose Correct Alternative (10 Marks)	
	b) State True or False (6 Marks)	16 Marks
Q.No.2	Write Short Notes (Any 2 out of 4)	16 Marks
Q.No.3	Problem on Computation of Total Income and Tax Liability	16 Marks
Q.No.4	Practical Problem	16 Marks
Q.No.5	Practical Problem	16 Marks
Q.No.6	a. Short Problem	8 Marks
	b. Short Problem	8 Marks

(Theory questions – 40% and Practical Problems – 60%)

Shivaji University, Kolhapur
Syllabus of Online M. Com.
Faculty of Commerce and Management Syllabus in
accordance with NEP 2020 Introduced from
Academic Year 2025-26
Online M. Com –I Semester- I
Advanced Accountancy Paper IV Title
of Paper- Introduction to Income Tax
(DSC-4) (MMA-IV)

2 Credits

Course outcomes
Students will -

1. Know the basic information related to income tax.
2. Know important terms and how to determine Residential Status of an Assessee
3. Understand procedure of assessment and Income Tax Authorities

	Course Content	
Unit-I:	Introduction to Income Tax	10 hours
Theory	Introduction to Income Tax Act 1961 and Finance Act, Indian Tax System – Direct Tax and Indirect Tax, Introduction to Income tax – meaning, Characteristics, procedure of charging tax and Income Tax Return, meaning of PAN, TAN, TDS	
Practical	Organize discussion with Tax Consultant to know the current practice.	
Unit-II	Basic Information about Income Tax	20 hours
Theory	Important Definitions Under the Income Tax Act, 1961, Residential Status, Procedure of Assessment (Sec. 139 to 149), Income Tax Authorities	
Practical	Group discussion can be conducted in the classroom on the contents of Unit-II	

Reference Books:

- 6) Singhania – Student's Guide to Income Tax
- 7) Prasad Bhagwati – Income Tax Law & Practice
- 8) Mehrotra H.C. – Income Tax Law
- 9) Dinkar Pagare –Income Tax Law and Practice
- 10) Ahuja and Gupta – Systematic Approach to Income Tax

Nature of Question Paper
M.Com. Part-I (Semester-I)
Introduction to Income Tax

Instructions:

1. Question No.1, and Q. No. 2 are Compulsory.
2. Attempt any Three Questions from Q. No.3 to 6.

Q.No.1	a) Choose Correct Alternative	(5 Marks)	
	b) State True or False	(3 Marks)	8 Marks
Q.No.2	Write Short Notes (Any 2 out of 4)		8 Marks
Q.No.3	Long answer question (considering the marks and time)		8 Marks
Q.No.4	Long answer question (considering the marks and time)		8 Marks
Q.No.5	Long answer question (considering the marks and time)		8 Marks
Q.No.6	a. Short answer question		4 Marks
	b. Short answer question		4 Marks

Shivaji University, Kolhapur

Syllabus of Online M. Com.

Faculty of Commerce and Management

Syllabus in accordance with NEP 2020

Introduced from Academic Year 2025-26

Online M.Com. – I Semester- II

Title of Paper-Advanced Accountancy -Paper V
(DSC-5) (MMA-V)

Course Outcomes - students will be able to -

4 Credits

1. accounting of business combination of companies
2. accounting of consumer co-operatives societies.
3. Understand the accounting for lease.
4. Understand the accounts of Electricity Companies.

Marks:- 80	Total- 60 Hours
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Syllabus Contents

Unit 1: a) Theory	Accounting for Mergers and Acquisitions of companies. (Purchase Method only)	15 Hours
b) Practical	Arrange group discussions on reasons of mergers and acquisitions and Analysis any case study of mergers or acquisitions.	
Unit 2: a) Theory	Theory - Final Accounts of Cooperative Societies as per Maharashtra Cooperatives Societies Act	15 Hours

b) Practical	Practical - 1. Visit any co-operative societies to see their Accounting process and discuss with respective authority who look after accounting in the concern co-operative 2. Take interview of auditor of any co-operative society or CA in respect of Cooperative accounting.	
Unit 3: a) Theory	Accounting for Lease (AS-19) Introduction, Types of lease, Accounting for operating lease and finance lease.	15 Hours
b) Practical	1. Arrange students seminar, quiz or group discussions on the difference between operating lease and finance lease. 2. Arrange guest lectures or workshop by inviting CA, Cost Accountant, and Expert in lease business.	
Unit 4: a) Theory	Accounts of Electricity Companies – Final Accounts	15 Hours
b) Practical	Download annual report of any electricity company and observe the financial statements	

Reference Book:-

1. Gupta S.C., Gupta M.P., Shukla M.C., Agrawal B.M. and Grewal T.S.(2019)Advanced Corporate accounting, S. Chand and Company, New Dehli.
2. Shukla M.C., Grewal T.S., and Gupta S.C (2016)Advanced accounts, S. Chand and Company, New Dehli.
3. Dehli.
4. Gupta R.L. and Radhaswamy M. (2018) Advanced accountancy Vol II, Sultan Chand and Sons, New Dehli
5. Arulnandan M.A. and Raman K.S. (2018), Advanced Accountancy (Corporate accounting), Vol. II, Himalaya Publishing house Mumbai.
6. Maheshwari S.M., Maheshwari Sunil and Maheshwari Sharad k. (2018), Corporate Accounting, Vikas Publication House, New Dehli.
7. Shukla M.C., Grewal T.S. and Gupta S.C., Advanced accounts, S. Chand and Company, New Dehli.
8. Jain S.P.; Narang K.L. ; Agrawal Simmi and Sehgal, Monik (2018). Advanced Accountancy (Corporate Accounting) Vol II, Kalyani Publishers, New Delhi.
9. Hanif M. and Mukharjee A. (2018). Modern Accountancy Vol. II, Mc Graw Hill Education India (Private)Ltd. Noida.

Suggested Additional Readings: (if web source then provide url)

1. Chakraborty, Hrishikesh, Advanced Accountancy , Oxford University Press.
2. Original documents of Accounting Standards issued by ICAI.
3. Companies Act 2013.

Suggested Research Journal:

1. Indian Journal of Accounting.
2. Indian Journal of Commerce.
3. The Chartered Accountant.
4. Management Accountant.

Shivaji University, Kolhapur

Nature of Question Paper

Online M. Com. - I Semester - II

Title of Paper-Advanced Accountancy -Paper V

Instruction:

1. Question Number 1 and 2 are Compulsory.
2. Attempt any three questions from question number 3 to 6.
3. Use of calculator is allowed

Q.1	a) Choose the appropriate alternatives (10) b) True and False (6)	16
Q.2	Short Notes(any 4 out of 6)	16
Q.3	Practical Problem	16
Q.4	Practical Problem	16
Q.5	Practical Problem	16
Q.6	a) Short Practical Problem	8
	b) Short Practical Problem	8

Theory questions - 40% and Practical Problems – 60%

Shivaji University, Kolhapur
Syllabus of Online M.Com.
Faculty of Commerce and Management
Syllabus in accordance with NEP 2020
Introduced from Academic Year 2025-26
Online M.Com. – I Semester - II
Title of Paper-Advanced Accountancy Paper VI
(Cost Accounting)
(DSC-6) (MMA-VI)

4 Credits

Course Outcomes:

1. Students will acquire the knowledge of elements of cost and cost sheet.
2. Students will acquaint the knowledge and skill to prepare job cost sheet and contract account.
3. Students will be able to explain the costing process for processing units and service organizations.
4. Students will understand to reconcile the cost and financial accounts.

	Course Content	
Unit-I:	Introduction and Elements of Cost:	(10 hours)
Theory	a) Meaning, scope, objectives and advantages of cost accounting b) Elements of Cost – Material Cost, Labour Cost and Overheads; Classification of cost, preparation of cost sheet and quotation.	
Practical	Collect cost data from any organization and prepare costsheet and quotations	
Unit-II:	Job Costing and Unit Costing	(15 hours)
Theory	Meaning, Features, Practical Applications of Job Costing and Unit Costing, Preparation of Job Cost Sheet.	
Practical	a) Collect cost data from organization which are working on job basis and observe job cost sheet	
Unit-III	Process Costing	(20 hours)
Theory	A) Process Costing: Meaning and its Applications, Concept of Equivalent Production, Preparation of Process Accounts, Concepts of Joint Products and By Products.	
Practical	Visit any processing unit and observe Process Accounts	
Unit-IV	Contract Costing	(15 hours)
Theory	Contract Costing- Contract Costing: Meaning, Features, Accounting Procedure, Retention money, Escalation Clause, Work in Progress, Cost Plus Contract. Preparation of Contract Account	
Practical	Collect cost data from any contractor and prepare contract account for a single contract	

Reference Books

1. Cost accounting – B.K.Bhar
2. Cost accounting – Jain and Narang
3. Cost accounting – S N Maheshwari
4. Cost accounting (Problems & Solutions) – Khanna, Pandey, Arora & Ahuja
5. Cost accounting – Shukla, Grewal & Gupta

Nature of Question Paper

M.Com. Part-I (Semester-II)

Advanced Accountancy Paper

VI (Cost Accounting)

Instructions

:

6. Question No.1, and Q. No. 2 are Compulsory.
7. Attempt any Three Questions from Q. No.3 to 6.
8. Use of calculator is allowed

Q.No.1	a) Choose Correct Alternative (10 Marks)	
	b) State True or False (6 Marks)	16 Marks
Q.No.2	Write Short Notes (Any 2 out of 4)	16 Marks
Q.No.3	Problem	16 Marks
Q.No.4	Problem	16 Marks
Q.No.5	Problem	16 Marks
Q.No.6	a. Short Problem	8 Marks
	b. Short Problem	8 Marks

(Theory questions – 40% and Practical Problems – 60%)

Shivaji University, Kolhapur
Syllabus of Online M.Com.
Faculty of Commerce and Management Syllabus
in accordance with NEP 2020 Introduced from
Academic Year 2025-26
Online M. Com. – I Semester- II
Title of Paper-Advanced Accountancy Paper VII
(Auditing)
(DSC-7) (MMA-VII)

Course Outcomes

After Studying this course, students shall be able to:

1. Understand the basic concepts and objectives of audit
2. Gain working knowledge of generally accepted auditing procedures
3. Identify the skills and techniques of conducting audit of various entities
4. Know the recent trends in practice of audit

4 Credits

Unit	Contents:	No. of Hours
I	Auditing and Assurance Standards Theory - Evolution of Auditing and Assurance Standards, Updated List of Auditing and Assurance Standards. Specific study of - AAS 1: Basic Principles Governing an Audit AAS 2: Objectives and Scope of Audit of Financial Statements AAS 3: Documentation AAS 5: Audit Evidence AAS 8: Audit Planning AAS 28: Auditor's Report on Financial Statements Practical: Visit to any firm of Chartered Accountants and organize discussion with the auditor on Auditing and Assurance Standards	15
II	Internal Control System Theory – Nature, Scope, Objectives and Limitations of Internal Control. Need for evaluation Internal Control System and techniques of evaluation of Internal Control System Practical: Visit to any company and observe internal control system and find out strengths and weaknesses of the system.	15
III	Specific Types of Audit Cost Audit, Tax Audit, Management Audit and Social Audit Audit of Computerized Accounting Practical: Visit any manufacturing company and understand the process of conducting cost audit and tax audit. Visit to any institute which is applying Computerised Accounting and try to understand the process of Audit of Computerized Accounting	15

IV	Audit of Various Entities Audit of Public Sector Undertakings, Audit of Educational Institutions Practical: Visit to educational institute and understand the process of conducting an audit. Download Auditor's Report of Public Sector Undertaking and discuss it in group discussion.	15
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Shivaji University, Kolhapur Nature of Question Paper M. Com. I Semester II Advanced Accountancy Paper VII (Auditing) Marks: 80 Duration: 3 hours	
Instructions: 1. Question number 1 and 2 are compulsory 2. Attempt any three questions from question number 3 to 6	
Q. 1 a. Choose the appropriate alternative	(10)
b. True or false	(6)
Q.2 Long answer question	(16)
Q.3 Short Notes (any 4 out of 6)	(16)
Q.4 Long answer question	(16)
Q.5 Long answer question	(16)
Q. 6. a. Short answer question	(8)
b. Short answer question	(8)

References:

1. A Handbook of Practical Auditing: Dr. B.N. Tandon, Dr. Sudharsanam, Dr. Sundarbhai, S. Chand Publications
2. Auditing and Assurance: Sanjib Kumar Basu, Pearson Publishing House
3. Advanced Auditing and Professional Ethics: CA Vinodkumar Agarwal, CA Aarati Lahoti, a. A.S. Foundation
4. Auditing and Assurance Services: Karen Hooks, Wiley Publishers
5. Auditing and Assurance: CA Surabhi Bansal, Bestword Publications
6. Audit and Assurance Standards in India: M P Vijaykumar, Snow White Publication
7. Fundamentals of Auditing: Kumar and Sharma, Prentice Hall (India) Publishers
8. Study Material of CA (IPCC and Final): The Institute of Chartered Accountants of India

Journals

9. The Chartered Accountant, The Institute of Chartered Accountants of India
10. Journal of Accounting, Auditing and Finance, Sage Publications
11. International Journal of Auditing, Wiley Publishers

Shivaji University, Kolhapur
Syllabus of Online M.Com.
Faculty of Commerce and Management
Syllabus in accordance with NEP2020
Introduced from Academic Year 2025-26
Online M.Com. – I Semester- II
Advanced Accountancy -Paper VIII Title of
Paper- Introduction to Auditing
(DSC-8) (MMA-VIII)

After Studying this course, students shall be able to:

1. Understand the basic concepts and objectives of audit
2. Gain working knowledge of generally accepted auditing procedures
3. Identify the skills and techniques of conducting audit of various entities
4. Know the recent trends in practice of audit

2 Credits

Unit	Contents:	No. of Hours
I	Basic Concepts of Audit: Theory - Meaning and Definitions of Audit, Scope of Audit, Objectives of Audit, Basic Principles Governing an Audit, Types of Audit. Practical: Visit to a firm of Chartered Accountants and discuss with C. A. on his / her practical experiences regarding audit of various entities.	15
II	Audit Procedure and Audit Report Theory - Concept of Vouching, Verification and Valuation Auditor's Report – Contents of Audit Report, Types of Audit Report Adverse Opinion and Disclaimer of Opinion Practical – Visit to an organization where actual audit in process and observe the process and report.	15

Reference Books:

1. A Handbook of Practical Auditing: Dr. B.N. Tandon, Dr. Sudharsanam, Dr. Sundarbhai, S. Chand Publications
2. Auditing and Assurance: Sanjib Kumar Basu, Pearson Publishing House
3. Advanced Auditing and Professional Ethics: CA Vinodkumar Agarwal, CA Aarati

Lahoti, A.S. Foundation

4. Auditing and Assurance Services: Karen Hooks, Wiley Publishers
5. Auditing and Assurance: CA Surabhi Bansal, Bestword Publications
6. Audit and Assurance Standards in India: M P Vijaykumar, Snow White Publication
7. Fundamentals of Auditing: Kumar and Sharma, Prentice Hall (India) Publihsers
8. Study Material of CA (IPCC and Final): The Institute of Chartered Accountants of India

Journals

1. The Chartered Accountant, The Institute of Chartered Accountants of India
2. Journal of Accounting, Auditing and Finance, Sage Publications
3. International Journal of Auditing, Wiley Publishers

Shivaji University, Kolhapur Nature of Question Paper Online M. Com. I Semester II Advanced Accountancy -Paper VIII (Introduction to Auditing)	
Marks: 40	Duration: 2 hours.
Instructions: 3. Question number 1 and 2 are compulsory 4. Attempt any three questions from question number 3 to 6	
Q. 1 a. Choose the appropriate alternative b. True or false	(5) (3)
Q.2 Case Study (preparation of Audit Report with the help of given information)	(8)
Q.3 Short Notes (any 4 out of 6)	(8)
Q.4 Long answer question (considering the marks and time)	(8)
Q.5 Long answer question (considering the marks and time)	(8)
Q. 6. a. Short answer question	(4)
b. Short answer question	(4)

Shivaji University, Kolhapur Syllabus of Online M.Com. Faculty of Commerce and Management Syllabus in accordance with NEP 2020 Introduced from Academic Year 2023-24 Online M.Com. – I Semester-I Elective I (BM): Paper I Business Management (DSE – 1) (EBM – 1)			
Course Outcomes	Understand the theoretical aspects of management and strategic management Describe the theoretical aspects of management and strategic management Understand the contemporary issues in management.		
	4 Credits		
Marks : 80	Total Hours of Teaching: 60	Theory: 60	Practical: Student Workload
Syllabus Contents:			
Unit 1: a) Theory	Introduction to Management: Definition, Nature, Significance, Managerial Skills, Mitzberg's Role, Management as a Profession, Code of Conduct for Managers. Functional areas of Management - Human Resource, Finance, Production and Marketing.		15 Hours
b) Practical	Visit any organisation and study the role of managers. Visit and study the functional activities of the companies. Submit the hand written report to the College/ Institution/ Department		
Unit 2: a) Theory	Contribution towards Management Thought: A) Contribution of Frank Gilbreth, Mary Parker Follett. Tom Peters and Robert Waterman. B) Organizational Learning Approach- Need and Evaluation. Virtual Organization - Features and Implications.		15 Hours
b) Practical	Visit any organization and study the management thought of concern organization and submit the hand written report to the College/ Institution/ Department.		
Unit 3: a) Theory	Strategic Management: (A) Concept, Importance, Levels of Strategy, Strategic Intent, Different type of Strategies, Strategic Analysis and Choice - Corporate Level Analysis (GAP analysis, BCG Matrix, GE9 Cell Matrix), Industry Level Analysis (Porter's 5 Forces Model). (B) Strategy implementation and control- Techniques of Strategy Evaluation - Functional Issues, Behavioural Issues and McKinsey's 7-S Model. Strategic Control Technique.		15 Hours
b) Practical	Visit to company, bank, NGOs etc. and study the adopted strategies by the same. Develop strategies for the companies. Submit the best suggested strategies for the visited company to the College/ Institution/ Department.		

Unit 4: a) Theory	. Contemporary Issues in Management: (A) Ethical Issues- Social, Cultural, Financial, Marketing and Environment related Issues. (B) Management of 21 st Century Organization - Challenges and Opportunities in E-Commerce, E-Business and M-Commerce.	15 Hours
b) Practical	Visit to company, social organizations etc. for collecting 21 st Century issues in management and submit the hand written report about ethical issues and challenges before the organization to the College/ Institution/ Department.	

Note:	Practical should be considered for Internal Examination for 5 (Five) Marks (Out of 10 Internal Marks)	
Reference Books: In Search of Excellence - Tom Peters and Robert H. Waterman, Strategic management – Azhar Kazmi Principles of management – P.C.Tripathi and P.N.Reddy Principles of Management – Koontz, O'Donnell and Weihrich		

	Shivaji University, Kolhapur Syllabus of Online M.Com. Faculty of Commerce and Management Syllabus in accordance with NEP 2020 Introduced from Academic Year 2023-24 Online M. Com. –I Semester-II Elective I (BM): Paper II Organizational Behaviour (DSE – 2) (EBM – II)		
Marks : 80	Total Hours of Teaching: 60	Theory: 60	4 Credits
Course Outcomes:	Describe theoretical concepts of organizational Behaviour. Classify types of personalities Summarize types of conflicts. Summarize adoption of organizational culture.		Number of hours lecture
Unit 1	Introduction to Organizational Behaviour: Concept, significance, Nature and scope of OB, contributing disciplines to OB, relationship between management and organizational Behaviour, Ethical issues in OB, Historical Development of OB, Models of OB.		15
Practical	Visit any nearby organization and observe management functions perform therein and report. Submit handwritten report.		

Unit 2	Individual and Group Behaviour: A. Foundations of Individual Behaviour – Personality (Concepts, Determinants and types), Perception (meaning, process, factors affecting perception), Attitude (Concept, formation and types), Values (Concept, types and formation) and Job Satisfaction (Concept, Determinants and Measurements), Learning (Meaning, determinants, principles) B. Foundations of Group Behaviour: Definition and importance of group, Types of group, Process of group development, Group Behaviour (Norms, Cohesion, Role intergroup Conflicts), Group performance factors, Quality Circle and Work Teams.	15
Practical 2	Classify the types of personality of sample employees in nearby organization.	
Unit 3	Organisational Conflict and Negotiation A. Organizational Conflict: Concept, types, sources and levels of organizational conflict, Traditional and modern approach to conflict, Functional and dysfunctional organizational conflict, conflict process, resolution of conflict. B. Negotiation: bargaining strategies, the negotiation process, individual differences in negotiation effectiveness, third party negotiations.	15
Practical 3	Prepare a poster on organizational conflicts and their resolution.	
Unit 4	Organizational Culture and Work Life Balance: A. Organizational culture: Definition, types, functions, creating, sustaining and changing culture a culture. B. Quality of Work life: concept, constituents of QWL, QWL in Indian context. Managing work life conflicts in organizations.	15
Practical 4	Prepare a report on organizational culture adopted in hereby organization.	
References: 1. Management and Organizational Behaviour – P. Subbarao 2. Organizational Behaviour – Keith Davis 3. Organizational Behaviour – Stephen Robbins 4. Organizational Behaviour – Dr. Anjali Ghanekar 5. Organizational Behaviour – Dr. C.B.Gupta 6. Organizational Behaviour – Dr. S.S.Khanka Organizational Behaviour – Stephen Robbins & Timothy Judge, 15th Edition, Pearson, Prentice Hall.		

Shivaji University, Kolhapur Syllabus of Online M. Com. Faculty of Commerce and Management Syllabus in accordance with NEP 2020 Introduced from Academic Year 2023-24 Online M.Com. – I Semester-I Elective II (ME): Paper I Managerial Economics (DSE – 1) (EME – I)			4 Credits
COURSE OUTCOMES: 1 Student should able to understand the variables and components of Managerial Economics 2 Students should study the applications of demand analysis and concepts related consumer's behaviors. 3 Student should aware regarding production, price determination and pricing practices and they should able to apply these in business decision making policies. 4 Student should understand the business cycle phenomenon and inflation for business decision making.			
UNIT -1	Introduction to Managerial Economics Meaning, Nature, Scope and Importance Economic Theory and Managerial Theory Role and Responsibilities of manager- managerial Economics and Decisions making Objectives of Business Firm		15
UNIT -2	Demand Analysis and Consumer Behavior Demand Function Concept and Types of Elasticity of Demand Measurement of Price Elasticity of Demand- Applications of Elasticity of Demand in Managerial decision Revealed Preference Theory – Theory of Consumer's Choice under Risks Demand Forecasting : Meaning and Methods		15
UNIT -3	Theory of Production, Price Determination and Pricing Practices Production Function : Short run, Long run and Cob-Douglas – Break Even Analysis Price and Output Determination under Monopolistic Competition and Oligopoly (Collusive and Non-Collusive) Pricing Practices: Cost Plus, Multiple, Dumping and Transfer Capital Budgeting- Criteria for Project Appraisal		15
UNIT -4	Theory of Business Cycles and Inflation Meaning, Phases of Business Cycles Theories of Business Cycles: Cob-Web, Hicks Monetary theories of Inflation : Friedman theory, Income theory Structurlist theories :Mark up theory by Ackley- Bottleneck theory by Eckstim		15
References – 1. Branson, William H. Macroeconomic Theory and Policy. HarperCollins India Pvt. Ltd. 2 Oliver J. Blanchard, Macroeconomics, Pearson Education 3 G. S. Gupta, Macroeconomics: Theory and Applications, McGraw-Hill			

Education 4 Shapiro, Macroeconomic Analysis 5 Paul A Samuelson, William D Nordhaus, and Sudip Chaudhuri, Macroeconomic, McGraw-Hill Education 6 Mithani D.M. Money, Banking, International Trade and Public Finance, 7 Vaish M.C. Monetary Theory 8 Agarwal H.S. Principles of Economics 9 Haberler, Theory of International trade 10 K.K.Dewett, Monetary Theory 11 H.L.Ahuja, Macro Economics: Theory and Policy Jhingan M.L. Macro Economic Theory 12 Gupta S.B. Monetary Economics	
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Shivaji University, Kolhapur
Nature of Question Paper
Online M. Com. I Semester II
Elective II (ME): Paper I Managerial Economics

Marks: 80

Duration: 3 hours.

Instructions: 1) Que.1 and 2 are compulsory
2) Attempt any three questions from Que. no 3 to 6

Case Study	16
Short answer type question (Any two out of three)	16
Long question	16
Long question	16
Long question	16
Q. 6 Write Short Notes (Any two out of three)	16

Shivaji University, Kolhapur Syllabus of M.Com Faculty of Commerce and Management Syllabus in accordance with NEP 2020 Introduced from Academic Year 2023-24 M.Com –I Semester-II Elective II (ME): Paper II International Business (DSE – 2) (EME – II)			4 Credits
COURSE OUTCOMES: 1. Students will understand the global economic and business world. 2. Students will equip with proper knowledge, abilities and skills of international business environment. 3. Students will get acquainted with the functions and mechanism of international financial institutions. 4. Students will enable with the knowledge of the plans and strategies to succeed at international business platform.			
UNIT -1	International Business Environment 1.1. Nature and Scope Issues in foreign investment-technology transfer, pricing and regulations, Human resource issues and Environmental issues Emerging economies and trade blocks		15
UNIT -2	International Marketing International Marketing – meaning, features, need and problems Entry strategies, market selection International production and supply chains Methods of Payments in international trade		15
UNIT -3	International Business Regulations 3.1 Bilateral and multilateral trade laws WTO- Settlement and Dhoha round of talks Dispute settlement mechanism under WTO Problems of Patent laws		15
UNIT 4	International Economy and India India's foreign trade in post globalization era India and IMF, IBRD Role of India in SAARC BRICS and India		15

References –

1. Mead R. (2004) International Management: Cross Cultural Dimensions, 3rd ed. New York Wiley
2. Vyuptakesh Sharan, (2004) International Business: Concept, Environment and Strategy, Pearson education, Singapore
3. Yarbrough B V (2005) The World Economy: Trade and Finance, 7th Ed Thomas south western USA
4. Manab Adhikari, Global (2006) Business Management(An International economic environment), Macmillan India Ltd
5. Hill C.W. L. and Jain A. K. (2007) International Business Competing in Global market Place, McGraw Hill New Delhi
6. Graham John L, Salwan Prashant, Cateora Philip R, (2008) International Marketing 13th Ed. Tata McGraw- Hill,
7. Varshney R.L. and Bhattacharya B, (2012) International Marketing Management -An Indian Perspective, 24th Ed S.Chand New Delhi
8. Jeevnandam C. International Business S.Chand New Delhi 2008
9. Paul Justein International Business, 5th Ed (2011) Prentice Hall of India, Pvt Ltd new Delhi
10. Keegan Warren J. and Green Mark C. Global Marketing, 4th Ed. (2009) Prentice Hall India, Pvt Ltd
11. Bhalla V. K. and Ramu S.S. (2009) International Business Environment, Anmol Prakashan New Delhi

Shivaji University, Kolhapur
Nature of Question Paper
Online M. Com. I Semester II
Elective II (ME): **Paper II**
International Business

Marks: 80

Duration: 3 hours.

Instructions: 1) Que.1 and 2 are compulsory

2) Attempt any three questions from Que. no 3 to 6

Case Study	16
Short answer type question (Any two out of three)	16
Long question	16
Long question	16
Long question	16
Q. 6 Write Short Notes (Any two out of three)	16

Shivaji University, Kolhapur Syllabus of M.Com Faculty of Commerce and Management Syllabus in accordance with NEP 2020 Introduced from Academic Year 2023-24 Online M. Com. – I Semester-I (Minor) Research Methodology (RM) (MRM) 4 Credits		
Course Outcomes	1. Familiarity with basics of research. 2. Designing research protocol for research problem. 3. Preparation of the instrument for data collection. 4. Ability of analysis and interpretation of data.	
Expected Skills Impartation(Through theory and Practical's)	1. Identifying and selecting research problem, 2. Preparing research design. 3. Preparing questionnaire/schedule and collecting data. 4. Analyzing and interpreting data and writing research report.	
Marks : 80		Total 60 Hours
Syllabus Contents:		
Unit 1: a) Theory	Basics of Research: Meaning and objectives of research, research in commerce and Management, Types of research, review of literature, research process, methods of research: Case study and survey method.	15 Hours
b) Practical	(a) Identification of research problem. (b) Classification of research problem according to types. (c) Formulation of research questions and objectives.	
Unit 2: a) Theory	Meaning and components of research design, exploratory research design, descriptive research design, diagnostic research design and experimental research design, Hypothesis: Meaning and Types of Hypothesis, process of formulating hypothesis. Sample Design- sampling techniques: random and non-random sampling methods.	15 Hours
b) Practical	(a) Preparation of Research Design. (b) Formulation of Hypothesis. (c) Selection of appropriate sampling design.	
Unit 3: a) Theory	Meaning of Data, Types of data-quantitative and qualitative, sources- Primary and secondary, methods of primary data collection-questionnaire method, interview method, observation method, focus group interview method, types of questions in questionnaire, sources of secondary data, classification, tabulation and graphical presentation.	15 Hours
b) Practical	(a) Preparation of questionnaire	

	(b) Preparation of interview schedule/observation schedule (c) Extraction of data from secondary sources (RBI, Government websites, national and international apex bodies etc.) (d) Classification of data and tabulation.	
Unit 4: a) Theory	Analysis and Interpretation of Data using various descriptive statistical tools (measure of central tendency, measures of dispersion, correlation and regression) Hypothesis testing by suitable methods. (Parametric and non-parametric tests), Chi-square test, One Sample 't' test and independent sample 't' test, layout of research project, steps involved in report writing, requisites of good research report.	15 Hours
b) Practical	(a) Analysis and interpretation of classified data by using statistical tools. (b) Testing of hypothesis by using appropriate test. (c) Report writing according to objectives and hypothesis. [Use any suitable software for the purpose of (a) and (b)]	
Note:	Questions on theory as well as problems/case on each unit should be asked in university examinations.	
Reference Books: 1. Michael V. P. 'Research Methodology in Management, Himalaya Publishing House, New Delhi 2. Krishnasawami O. R. and Ranganathan M., 'Methodology of Research in Social Sciences', Himalaya Publishing House, New Delhi 3. Kothari C. R., 'Research Methodology-Methods and Techniques', New Age International Publisher 4. Pauline V. Young, 'Scientific Social Surveys and Research', Prentice-Hall of India Pvt. Ltd., New Delhi. 5. Sachdeva J. K., Business Research Methodology, Himalaya Publishing House, New Delhi 6. Gupta S. C., "Fundamentals of Statistics", Himalaya Publishing House. 7. Gupta S. P. "Statistical Methods", Sultan Chand and Sons, New Delhi		
Suggested Additional Readings: 1) Chawla, Deepak and Sondhi, Neena (2018). Research Methodology Concept and Cases, Noida: Vikas Publishing House Pvt. Ltd. 2) Kishore, Ravi M. (2018). Business Statistics,		
Suggested Research Journal : 1) Indian Journal of Commerce 2) Indian Journal of Accounting 3) Indian Journal of Marketing 4) Management Accountant 5) Vikalp 6) Decision 7) IIMB Review		

Shivaji University, Kolhapur
Nature of Question paper
Online M. Com. I Semester - I
Research Methodology

Total Marks: 80:

Duration 3 hours

Instructions: 1) Q. No. 1, 2 and 3 are Compulsory

2) Attempt any two questions from Q. No. 4 to 6

Que. No.	Nature of Question	Marks
1	A) Choose the correct alternative	10
	B)'True' OR 'False'	6
2	Short notes (Any 4 out of 6)	16
3	Case study or Long answer question	16
4	Long Answer Question	16
5	Long Answer Question	16

Shivaji University Kolhapur
Syllabus in accordance with NEP- 2020
Introduced from Academic Year 2025-26
Online M.Com. Part –I, Semester II
Guidelines for the On the Job Training (OJT) / Internship

1. On the Job Training (OJT) is to be completed by the student at any commercial organisation/NGO. For this purpose, the organisations may include office of Chartered Accountant, Cost and Management Accountant, Company Secretary, Management Consultant Government or Semi-Government organisation, cooperative society, bank, local authority etc. (The list is for reference only; not exhaustive; other similar organisations can be considered for OJT)
2. OJT is to be completed by the candidate/student under the guidance of guide/mentor from the college, affiliated to any recognized university or autonomous institute as well as industry/organisation guide/mentor where he/she is doing internship/apprenticeship.
3. OJT Report is to be prepared which shall be based on the field work and a soft copy of it has to be submitted to the Centre for Distance and Online Education before commencement of semester end examination.
4. The OJT Report shall consist of the following: Title page should cover the following:
 - a. Name of the intern (student)
 - b. Name of the internal guide and external guide/mentor
 - c. Name of the Centre
 - d. Organisation where internship is conducted
 - e. Duration in which internship was completed

The main text of the report should consist of:

- a. Profile of the organisation
 - b. Details of work done during the internship
 - c. Key learning/takeaways/ skills acquired during the internship
 - d. Responsibilities handled during the internship
 - e. Problems faced during the internship
 - f. Any significant contribution/solution provided to the organisation during the internship
 - g. Conclusion
 - h. Attendance sheet (day-wise) signed by industry/organisation guide.
5. Internship/Apprenticeship report shall consist of around 40 to 50 typed pages.
6. All recognized P.G. Teachers and also teachers teaching to M. Com Course under the Faculty of Commerce and Management are eligible to work as mentor or guide of the trainee, affiliated to any recognized university or autonomous institute. The Programme Coordinator of Online M. Com. Programme, may appoint such teachers as guide or mentor.
7. Total duration of OJT shall be of 120 hours. The centre has flexibility to allow the students to complete the Internship/Apprenticeship at any time during the semester, but the soft of project report of OJT has to be submitted before commencement of semester end examination.

8. In case of students registered on online mode and who are already working/employed, they have to submit the OJT report. However, they can complete OJT in the same organisation where they are working/employed. Those students who are registered on online mode, but not working/employed anywhere, have to complete OJT as per the guidelines.

9. Evaluation of On the Job Training

There shall be evaluation of a maximum of 100 marks for OJT on the following criterion and shall be done by Programme Coordinator and Course Co-ordinators of Online M. Com. Programme.

Sr.	Criterion for Evaluation	Maximum Marks
1	Attendance and Engagement	10
2	Relevance of Internship/Apprenticeship with curriculum	10
3	Responsibilities handled during Internship/Apprenticeship	20
4	Skills acquired during Internship/Apprenticeship	20
5	Contribution of Intern/Apprentice to the organisation	20
6	Internship/Apprenticeship Report	20
	Total	100
