INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

Internal Assignment for IIIE Students

February- 2027 Examination

The Internal Assignment for Preliminary, Section-A &; Section-B will be required to be submitted by those students appearing for February 2027 exam. All eligible students are hereby directed to submit the completed Internal Assignment for the subjects they are appearing for February 2027 exam **on or before 10th December 2026**. Assignments are an important aspect of examinations. It is obvious that if you get good marks in assignment your overall percentage shall improve. The weightage for the Internal Assignment will be 20% of the total marks in the respective subject. Internal Assignments are attached below

INSTRUCTIONS FOR INTERNAL ASSIGNMENT

Submission of Assignment is Compulsory. If Assignment not submitted, such a students shall be given ZERO (0) marks.

1. **Students have to pass individually total 40 marks in each subject, written exam 80% and in Assignment 20% weightage.**
2. **Assignment is compulsory only for the subject's students appearing for Exam.**
3. **It will be the responsibility of student to appear or not to appear for the written paper if he / She has NOT SUBMITTED ASSIGNMENT in time as per instructions. IIIE shall not be responsible for the consequences.**
4. **Please write carefully your Name, Student membership number, Subject name on each Subject Assignment. Please take printout from first page and fill all details before tape binding the assignment pages.**
5. **It is advised that assignment should be written on the format page given below with this. All assignments to be separately submitted for each subject in a format pages. Write down on both sides of the papers.**
6. **The fees for Internal Assignment will be Rs.200/- per subject. This is to be paid through Demand Draft or Online only (Cheque payment will not be accepted) DD drawn in favour of Indian Institution of Industrial Engineering, payable at Mumbai and sent along with Assignment. Write your name and membership number on the back side of the Demand Draft, Online payment / transaction details should be attached with assignment. Bank details is given below for Online payment.**

   Name of Account: Indian Institution of Industrial Engineering
   Current Bank A/c No.: 00 5320 100000 720
   Bank Name : Bank of India
   Branch: Belapur, Navi Mumbai 400 614
   IFSC : BKID0000053

7. **Solve the questions as per instructions (do not leave any questions or sub questions). Detailed answers are expected. Keep sufficient gap between answers of different questions.**

8. **The paper should be written neat and clean. Leave left margin, top margin and bottom margin. Write up should be legible. Solve all questions sequence wise (from 1 to 7 in ascending order).**
9. **The expected length of the answer shall depend upon the nature of the question.**
10. **Answers shall include the definition, Diagrams, Tables, examples, etc. depending on the nature of the question. Do not waste your time in decorating assignments.**
11. **IE005: Engineering Drawing & Computer Graphics assignment, student may use drawing sheets.**
12. **Content that has been directly copied from each other or the Internet will NOT be accepted.**
13. **Assignments that have been copied and shared among student(s) will be automatically rejected and such students are liable for disqualification.**
14. **Ensure that your answers are according to the marks allocated. Students are advised to check their Assignments thoroughly before submitting the same.**
15. **Late submissions up to 15th December 2026 will be accepted with Rs. 200/- per subject as late fees.**
16. **Beyond 15th December 2026 Internal Assignment will not be accepted.**
17. **It is necessary to keep Xerox Copy of all documents (Assignments and DD) with you for your reference and safety.**
18. **The following Front Cover & second page is Compulsory should be Attached with Each Internal Assignment.**
19. Write page number from first page of Assignment like Page No 1/20, 2/20 etc & assignment to be written on printed format A4 size page only and bind properly.
20. All students are hereby informed that Internal **Assignments must be submitted in tape binding** only. Ensure that the binding is **neat and secure**. Submissions in spiral, stapler, or loose format will not be accepted. Assignments not submitted in tape binding will be considered incomplete.



Sample of Tape Binding

If students still have any doubt, they may call or email their queries to Controller of Examinations, IIIE.

Sd/-

Controller of Examinations

NOTE: DOWNLOAD THE BELOW PAGE FOR WRITING ASSINGMENTS.

STUDENT ASSIGNMENT FOR FEBRUARY-2027 EXAMINATION

Student Name : _____

Membership No. : _____

Section : _____

Subject Code & Name : _____

Assignment Payment Details UTR No. / DD No. _____

Bank Name : _____

Payment Date : _____

Signature of the student with date _____

Student Membership Number-					
QUESTION NO	(a)	(b)	(c)	(d)	TOTAL MARKS (To be filled by Examiner)
CANDIDATE NEED TO TICK IF ATTEMPTED					
1					
2					
3					
4					
5					
6					
7					
TOTAL MARKS: -					

SIGNATURE OF THE EXAMAINER WITH DATE

Student Membership NO: **Subject Code & Name :**

SECTION: Preliminary/ Sec- A / Sec- B. (February-2027 Exam)

TAPE BINDING

TAPE BINDING

Student Membership NO: **Subject Code & Name :**

SECTION: Preliminary/ Sec- A / Sec- B. (February-2027 Exam)

Mandatory Format for who have done online payment for Internal Assignments February- 2027 Examination.

- Student Name: _____
- Student Membership No. : S-_____
- Section: _____
- Online Transaction Date: _____
- Amount Transferred (Rs.)_____
- Transaction ID/UTR/UPI/IMPS or Neft No._____
- Total Nos. of Assignments: _____

Important Notice: Transaction details hard copy should be submitted along with Assignment (Don't paste hard copy on Assignment) and soft copy of the same (transaction details) to be sent through e-mail to iiiereceiptdept@gmail.com is compulsory.

Date: -_____ Signature of Student

N.B.: This requirement of account section so please submit properly.

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February-2027

Section-A

IEA 01: PROBABILITY AND STATISTICAL METHODS

Max. Marks: 140

Instruction: All questions are compulsory.

Q1. **a**) Two production lines produce identical components.

Line	Sample Size	Mean Weight (g)	SD (g)
I	120	205	12
II	100	210	10

i) Test for difference between means.
ii) Obtain a 95% confidence interval.
iii) Interpret the practical significance. (10)

b) The annual incomes (₹ thousands) of two groups are:

Group A: 350, 400, 420, 450, 500

Group B: 180, 210, 220, 240, 260

Calculate: i) Range ii) Mean iii) Standard deviation iv) Coefficient of variation

Compare the consistency of the groups. (10)

Q2. **a)** A company expects product demand proportions of 40%, 30%, 20% and 10% for four product categories. A sample of 600 customers gives frequencies 250, 160, 120 and 70 respectively. Test whether demand follows the expected proportions**.** (10)

(b) A random sample of 700 oranges was taken from a large consignment and 100 found to be defective. Construct the 95% confidence limits for the % number of oranges in the consignment. (10)

Q3. a**)** A pharmaceutical company claims that the average concentration of an active ingredient is 250 ppm. Formulate suitable null and alternative hypotheses and discuss decision errors. (10)

b) The weights of cereal packets are normally distributed with mean 1000 g and standard deviation 25 g.

i) Probability that a packet weighs more than 1030 g.
ii) Probability that a packet weighs between 980 g and 1020 g.
iii) Expected number of packets below 950 g in a production of 8000 packets. (10)

Q4. **Analyze the following data using one-way ANOVA:**

Sample 1	Sample 2	Sample 3
15	18	22
16	20	24
17	19	25
18	21	23
16	20	24

a) Compute Correction Factor and Total sum of squares.
b) Compute Treatment SS and Mean square treatment.
c) Compute Error SS and Mean square error.
d) Prepare the ANOVA table and interpret. (20)

Q5. **a)** Ten participants in a contest are ranked by two judges as follows:

x	1	6	5	10	3	2	4	9	7	8
y	6	4	9	8	1	2	3	10	5	7

Calculate the rank correlation coefficient ρ (10)

b) In a certain factory turning out blades, there is a small chance 1/500 for any blade to be defective. The blades are supplied in packets of 10. Use the Poisson distribution to calculate the approximate number of packets containing no defective, one defective, two defective blades in a consignment of 10000 packets. (Given $e^{-0.02} = 0.9802$). (10)

Q6. **a)** Explain various forecasting methods used in time series analysis and compare their merits and demerits. (10)

b) Explain the decomposition of a time series into trend, seasonal, cyclical and irregular components. (10)

Q7. **a)** Write detailed notes on SPSS, data handling, statistical analysis tools, advantages and limitations**.** (10)

b) Explain the steps involved in testing the goodness of fit of a probability distribution. (10)

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 02: Operations Research

Max. Marks: 140

Instruction: All questions are compulsory.

Q1. A. **Explain the principles of modeling** in OR. (10)

Q1. B. Draw a **decision tree** for a company choosing between two projects with given probabilities of success. (10)

Q2. A. Explain the methods of Testing of Random numbers. (10)

Q2. B. A security dealer recommends two types of investments A and B to his client Investment A returns 6% and B 8%. The client has almost Rs 100000 to invest. The client wants the total annual returns to be at least Rs 7000 and at least 275th of the amount to be invested in investment B. The security dealer gets 5% of the income from investment A and 4% of the income from investment B. Construct the mathematical for the problem to maximize the total fee of the security dealer. (10)

Q3. A. Explain the role of **simulation in OR** (10)

Q3. B. A factory produces **bicycles** daily (95–105 units). A truck carries 100 bicycles. Using random numbers (12, 34, 56, 78, 90, 11, 22, 33, 44, 55), simulate to find:

i) Average bicycles waiting

ii) Average empty truck spaces (10)

Q4 A. Explain the concept of **convex sets** with an example. (10)

Q4. B. Q3. B Solve the following system using **matrix inversion**:

$3x + 2y = 11, 4x + y = 13$ (10)

Q5. A. A furniture company manufactures **tables, chairs, and cupboards**. Each requires labour, wood, and nails. Monthly availability is limited. Formulate the problem as an **LPP**. (10)

Q5. B. Solve for the **optimal production mix** using simplex method.

(Hint: Use simplex method for optimum solution) (10)

Input	Table	Chair	Cupboard	Availability
Labour (hrs)	10	6	12	1200 hrs.
Wood (sq ft)	20	15	25	2400 sq. ft
Nails (kg)	3	2	4	400 kg
Selling Price (Rs.)	5000	3000	7000	

Q6. Write short notes on : (20)

A) Queuing models

B) OR packages for simulation

Q7. Explain with the help of flow chart, the simplex Algorithm? (20)

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 03: Financial Accounting & Costing

Max. Marks: 140

Instruction: All questions are compulsory.

Q1 From the following information prepare trading and profit and loss account and Balance sheet of M/s DMTA & Co for the year ending March 31, 2026: (20)

Account Title	₹	Account Title	₹
Drawings	20,000	Capital	2,00,000
Sundry debtors	80,000	Return outwards	2,000
Bad debts	1,000	Bank overdraft	12,000
Trade expenses	2,400	Provision for bad debts	4,000
Printing & Stationery	2,000	Sundry creditors	60,000
Rent Rates & Taxes	5,000	Bills payable	15,400
Freight	4,000	Sales	2,76,000
Returns inwards	7,000		
Opening stock	25,000		
Purchases	1,80,000		
Furniture & Fixture	20,000		
Plant & machinery	1,00,000		
Bills receivable	14,000		
Wages	10,000		
Cash in hand	6,000		
Discount allowed	2,000		
Investments	40,000		
Motor car	51,000		
	5,69,400		**5,69,400**

Q2.a) Find the future values of the following ordinary annuities: (5)

i) FV of Rs 400,000/- each 6 months for 5 years at a simple rate of 9 %, compounded semiannually. Draw cash Flow diagram

ii) FV of Rs 200,000/- each 3 months for 5 years at a simple rate of 9 %, compounded quarterly. Draw cash Flow diagram (5)

Q2. b) Write about the following as source of long term financing

i) Equity shares (10)

ii) Debentures and bonds

Q3 a) Write short note (20)

1. International Financial Reporting Standards (IFRS)
2. Generally Accepted Accounting Principles (GAAP)
3. Budgetary Control System
4. Standard costing budget

Q4 Show the Store Ledger entries as they would appear when using (20)

1. FIFO
2. LIFO
3. Weighted average method
4. Simple average method

April	1.	Balance	500 units	Rs. 900/-
	2.	Purchase	200 units	Rs. 330/-
	4.	Issued	350 units	
	6.	Purchase	400 units	Rs. 1020/-
	11.	Issued	250 units	
	19.	Issued	100 units	
	22.	Purchase	350 units	Rs. 875/-
	27.	Issued	250 units	

Q5a) The fixed costs for the year 2012-2013 are Rs.10, 00,000/-. The estimated sales for the period are valued at Rs.25,00,000/- The variable cost per unit for the single product made is Rs.50/-, If each unit sells at Rs.210/- and the number of units involved coincides with the expected volume output, construct Breakeven Chart. (15)

Determine (a) Breakeven point (b) Above how many units, the company should produce in order to seek profit (c) Determine the profit earned at a turnover of Rs.20,00,000/- (d) Margin of safety

b) Write short note on Break even analysis with graphical representation (5)

Q6 AD & CO just purchased a new office for Rs. 5800000/-. It was able to make a down payment equal to 25% of the value of the house; the balance was mortgaged. The rate by the bank is 10% compounded annually. The mortgage has a 15year amortization period (this means that payments are calculated assuming it will take 15 years to pay off the loan). (20)

(a) What will be the size of the payments by factor formula?

(b) What will be the balance remaining on the mortgage after 10 years?

Q7 Describe the following costing systems (20)

a) Batch costing

b) Activity based costing

d) Contract costing

e) Standard Costing

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INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 04: Principles & Practices of Management

Max. Marks: 140

Instruction: All questions are compulsory.

Q1 a) Explain the planning process. Discuss objectives, policies, procedures and strategies. (10)

b) Define Project Management? What are the functions of Project Manager? (10)

Q2 a) Explain authority, responsibility and accountability. How are these concepts interrelated? (10).

b) Explain empowerment of employees. And how does empowerment improve organizational performance? (10)

Q3 a) Explain principles of Scientific Management and their applications in industry. (10)

b) Explain Change Management. What are the major causes of resistance to change? (10)

Q4 a) Explain objectives and functions of Human Resource Management. (10)

b) Describe Recruitment, Selection, Training and Development process. (10)

Q5 a) Explain Production Planning and Control (PPC) with a neat block diagram. (10)

b) Explain Mass Production and Continuous Production systems. (10)

Q6 a) Explain objectives and functions of Marketing Management. (10)

b) Discuss Product Life Cycle and its stages. (10)

Q7 a) Define PERT and CPM. Differentiate between them. (10)

b) Explain project cost reduction techniques and least-cost project duration concept. (10)

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 05: Work System Design

Max. Marks: 140

Instruction: All questions are compulsory.

Q1 a) Explain step by step, how to determine required sample size for Activity / Work sampling for getting proportion of a machine working and non-working. Make suitable assumptions, required if any, and write them explicitly in the answer. (10)

b) Differentiate clearly between Total productivity and Partial/Factorial productivity.

Illustrate with an example. Write Formulae. (10)

Q2 a) 'Productivity Measurement is the first step in the Productivity Improvement'.

Do you agree with the above statement?

Justify your viewpoint with three supporting examples. (10)

b) What is a Stop watch Time study? Explain it in detail with an industrial example from your company/ factory where you are working. (10)

Q3 a) Design suitable incentive scheme for the manual assembly work of a product which has 20 different components and standard time of 15 minutes per unit. (10)

b) Explain various aspects of 'Hot Work' in factories. (10)

Q4 a) Explain various Process chart symbols with two examples for each. (10)

b) Draw two handed process chart for the following activity. (10)

Take out mobile phone from your pocket, type 'work completed' message and send it to your manager, put mobile phone off and then keep it back into the trouser pocket.

Q5 a) Explain five applications of Standard Time values for managerial decisions. (10)

b) What is MOST? Explain in detail, various activity sequences in it. (10)

Q6 a) What is meant by the term 'Bottleneck Operation'? What are its various positive and negative aspects? Draw a diagram to show its location in the production line. (10)

b) What do you understand by the term 'Work Posture'? What are the various aspects of a positive work posture and a negative work posture. (10)

Q7 Explain following concepts. (20)

a) Contingency Allowance
b) Ineffective Time due to shortcomings on the part of the Management
c) Range of neck movements in HFE
d) Theory of Learning Curve

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 06: Manufacturing Technology

Max. Marks: 140

Instruction: All questions are compulsory.

Q1. a) Explain Sand Casting process with neat diagram. (10)

b) Explain major casting defects and methods to avoid them. (10)

Q2. a) Explain Gas Welding and compare it with Arc Welding. (10)

b) Explain different types of Resistance Welding. (10)

Q3. a) Explain any four Sheet Metal Working processes with diagrams. (10)

b) Explain stress-strain curve for ductile material. (10)

Q4. a) Draw and explain conventional Lathe Machine components. (10)

b) Explain Centre Drill and Steady Rest with diagrams. (10)

Q5. a) Explain Geometry of Cutting Tools and Tool Wear. (10)

b) Explain Quick Return Mechanism in Shaper Machine. (10)

Q6 a) Explain the concept of Group Technology. (10)

b) How CAPP helpful for Industry. (10)

Q7 a) Explain CNC machine and Programming. (10)

b) Explain the Concept of CIM. (10)

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 07: System Approach

Max. Marks: 140

Instruction: All questions are compulsory.

Q1. a) Explain the origin and historical development of System Science. Discuss its importance in modern management. (10)

b) Describe the major contributors to the evolution of General Systems Theory and their contributions. (10)

Q2 a) Differentiate between open systems and closed systems with suitable examples. (10)

b) Explain the characteristics, advantages, and limitations of open and closed systems in organizations. (10)

Q3 a) Distinguish between Hard Systems and Soft Systems approaches. Give suitable industrial examples. (10)

b) Explain the concept of system complexity and discuss the factors contributing to complexity in organizations. (10)

Q4 a) Explain the systems view of management. How does it differ from the traditional management approach? (10)

b) Discuss an organization as a system, highlighting its components, inputs, processes, outputs, and feedback mechanisms (10)

Q5 a) What is Cybernetics? Explain its role in management and organizational control. (10)

b) Discuss the concepts of feedback, control, and communication in cybernetic systems with examples. (10)

Q6 a) Explain the Socio-Technical Systems (STS) approach and its significance in organizational design. (10)

b) Discuss the interaction between social and technical subsystems in an industrial organization. (10)

Q7 a) Explain the systems approach to organizational problem solving with a suitable framework. (10)

b) Describe the steps involved in applying systems methodology for solving organizational problems. (10)

INDIAN INSTITUTION OF INDUSTRIAL ENGINEERING

GRADUATESHIP EXAMINATION

Internal Assignment for February 2027 (Old Syllabus)

Section-A

IEA 08: Economics & Indian Economic Environment

Max. Marks: 140

Instruction: All questions are compulsory.

Q1 a) Explain wants, production, and consumption in Economics. (10)

b) Explain the concept of utility and its importance in economics. (10)

Q2 a) What is demand? Explain the types of demand with examples. (10)

b) Explain the factors affecting demand in detail. (10)

Q3 a) What is elasticity of demand? Explain its types. (10)

b) Explain price elasticity of demand and its importance (10)

Q4 a) What are the characteristics of Perfect Competition market? (10)

b) Explain Monopoly market and its features. (10)

Q5 a) What is Oligopoly? Explain its characteristics (10)

b) Explain Monopolistic Competition and its features (10)

Q6 a) Explain full employment, underemployment, and unemployment. (10)

b) Explain the concept of saving and its role in economy. (10)

Q7 a) What is economic development? Explain its indicators. (10)

b) Explain infrastructure in India (transport, communication, power) and its importance. (10)