Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: English Code: M101

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1.A Do as directed (Any ten) **10**

a. You should not be rude. (Add a question tag).
b. I have made that taxi driver's day.(change the voice).
c. I have more experience than you. (Change the degree)
d. No system of government is perfect.(Make it Affirmative).
e. He confessed his crime.(Make it complex sentence)
f. He said that he was innocent. (Make it simple)
g. He said," I am very busy now". (Change into indirect speech).
h. It was a great movie.(make it Exlamotory).
i. They have booked our seats. They have sent us a telegram (use not only-but also)
j. There is nothing better than a busy life.(make it interrogative)
k. This fact is too evident to require proof. (Remove too).
l. If you do not eat good food, you will not be healthy.(Rewrite Using 'Unless')

Q1.B Fill in the blank, with suitable articles (Any four) **04**

a. This is _____ best book I have ever read.
b. Twelve inches make _____ foot.
c. Take _____ umbrella for protection from rain .
d. She can play _____ flute.
e. Man is _____ intelligent being.

Q2 A Separate the clauses and name them (Any 4) **04**

a. See how much I have done for the game.
b. I am aware that the system isn't fool proof.
c. When he was young, he was just like you.
d. Come back when you become a butterfly.
e. Before I hailed them ,they had stopped .
f. Come quickly before it falls.

Q2. B Add suffix and Prefix in the following words (Any Six) **06**

a. _____ claim	b._____ Precious.	c._____ fast.
d._____ meter.	e. _____nutrition.	f._____tension.
g. Inter_____.	h. Way_____.	i. Side_____
j. Hope_____	k. Other_____	l. Whole_____

Q2.C Fill in the blanks with the appropriate form of verbs given in the bracket. (Any Four) **04**

a. He (read) when she came in.
b. We (work) all day yesterday.
c. When I (go) out in the sun.
d. He speaks as a one who (Know)
e. He already (design) some public buildings.

p.t.o.

Q3.A Use the following phrases in your own sentences (Any six). **06**

a.Come away	b. Run over	c. Show off	
d.Think over	e. Go through	f. Look after	
g.Watch out	h. Work out	i. Wind up	j.Take back

B. Insert the given adverbs (Any four) **04**

a. My friend accepted my invitation (gladly).
b. We go to sleep at 10 p.m (generally).
c. Miss Jesudasem is very cheerful (Usually).
d. These flowers start blooming (early).
e. The workers repaired these holes (recently).

C. Write a short paragraph on - "Social media" **04**

Q4A Correct the following sentence. (Any four) **04**

a. It is much too hot today.
b. She is more educated than me.
c. I cannot help but think that you are correct.
d. This was her who they know.
e. I am confident to win the prize.

Q4B i) Write a letter to place on order of medicines at the nearby Apollo pharmacy. **08**

Or

ii) Write a letter to your friend congratulating him / her on his / her big success in business.

Q5A.Read the passage carefully and answer the question given below **10**

The most important aspect of life is to be humble. 'Pride goes before a fall' Education and culture . should be magnetically felt, through your personality. A laughing face, polite, courteous talk, clean pure heart,sympathetic and understanding attitudes are better passport through life's journey. Lazy, selfish, egocentric, rude, behaviour speak low about the individua. Respect for elders.concern for family and love for mankind are rare gifts given by God. All are talents but not equally, bear this axiom in mind, as you sail through the ocean of life, let not false pride trap you. Have self respect but not false empty pride.

Questions;-

a. Explain the proverb ' pride goes before a fall'
b. Which is the axiom to be remembered by us?
c. Which are the passports for life 's journey?
d. How would you judge a person's character?
e. What is the passage about?

Q5B Attempt a summary of the above passage and suggest a suitable title. **04**

Q6A Write a short conversation between two friends about study. **06**

Q6B combine sentence using noun, Adverb and Adjective clauses (Any six) **06**

a. The day was a wonderful day. Terri was married on that day.
b. The restaurant had closed permanently. The customers were shot there.
c. The mechanic repaired my sister's car. The car had warped block.
d. The doctor examined the patient. The patient had fallen from a cliff.
e. Someone telephoned me. It is still a mystery.
f. He prefers something. It is not known to me.
g. He will come at any time. This is uncertain.
h. She was so tired . she could barely keep her eyes open.
i. Henry will go to the party, his friends will be there.
j. He was jogging his friend biked beside him.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Communication Skills Code: M102

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.

Q1 Answer the following questions. (Any 5) **20**

a. State the importance of communication in corporate life.
b. Explain the concept of "knowing the audience".
c. What are the principles of effective communication?
d. Explain the importance of visual and auditory method of communication in day to day life.
e. "Eye contact plays an important role in communication". Explain.
f. What are the qualities required for organizing a message?
g. Describe the features of technical writing.

Q2 Write an essay in about 250 words. (Any 1) **12**

a. Impact of social media on youth. b. My first trip to abroad.
c. A week without internet and technology.

Q3 Answer the following questions. (Any 2) **12**

a. Draft a report on a seminar / workshop you attended related to your diploma subject.
b. You are incharge of project regarding "Traffic control in your area". Draft a project report to the road transport officer.
c. Draft a notice about a workshop on 'New Technology' arranged for diploma students.

Q4A Answer the following questions. **06**

i. Draft an application to the HR manager of a company requesting for training opportunity.
ii. Draft a letter to the water supply department complaining about dirty water supply in your area.

B . State the different forms of verbal communication? Explain them in brief **06**

Q5A Read the following extract carefully and answer the question **08**

In today's world of rapid industrialization, the importance of sustainable development cannot be ignored. Economic growth is necessary for any nation, but uncontrolled growth after often leads to depletion of natural resources, pollution and climate change. Engineers and technologists play a major role in balancing progress with sustainability. For example the use of renewable energy sources such as solar and wind can reduce dependence on fossil fuels. Similarly recycling of materials and adoption of energy efficient technologies can minimize waste. However the challenge lies in changing human behavior without awareness and responsibility among citizens even the most advanced technologies cannot bring. Long term benefits, thus development must always go hand in hand with environmental protection.

Question-

1. What is the main concern mentioned in the passage?
2. How can renewable energy sources help in sustainable devlopment?
3. What role do engineers and technologists play in sustainability?
4. Why is humans behaviour considered a challenge in achieving sustainability?

B. Write Summary of the above extract and suggest a suitable title. **04**

Q6a Answer the following questions **08**

i) Prepare a speech on "Role of Technology in Modern Education" for a seminar in your institute.

Or

ii) Write a speech for a farewell function on the topic " Memories of college life and future goals"

b.Write a short note on **04**

i) Self image ii) Graphic communication.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Basic Science Code: M103

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. State and explain Snell's law of refraction with suitable diagram.
b. State any four properties of LASER.
c. Define and explain 'angle of contact' in water and mercury liquid with suitable diagram.
d. Differentiate between strong acid and base.
e. State and explain Faraday's second law of electrolysis.
f. Differentiate between Ion and atom (any four points)

Q2 Answer the following questions. (Any 2) **12**

a. Define 'unit'. state any four requirements of standard unit.
b. Define 'energy'. state laws of conversation of energy.
c. State any six application of LASER.

Q3 Answer the following questions. (Any 2) **12**

a. Differentiate between fundamental quantities and derived quantities.
b. State and derive Newton's second law of motion (F=ma).
c. Define the terms I) electrolysis, II) electrodes , III) ionization.

Q4 Answer the following questions. (Any 2) **12**

a. Define 'error'. state the formulas for estimation of error in the measurement.
b. Differentiate between centripetal force and centrifugal force.
c. Define I) cohesive force II) adhesive force III) surface tension.

Q5 Answer the following questions. (Any 2) **12**

a. Define the terms I) speed II) linear motion III) Velocity.
b. Define pH and pOH. And explain these concepts with suitable labelled diagram.
c. A current of 4 amperes is passed through copper sulphate (ag) solution for one hour. Calculate the weight of copper deposited at cathode. (Given ECE of copper = 0.000326 gm)

Q6 Answer the following questions. (Any 3) **12**

a. Define and explain polarization of light with suitable labelled diagram.
b. Define 'viscosity'. explain Newton's law of viscosity.
c. Explain Arrhenius concept of acid and base.
d. Distinguish between weak acid and weak base.
e. Describe the silver plating process on iron spoon with suitable labelled diagram and schematic representation.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Basic Enginearing | Code: M104

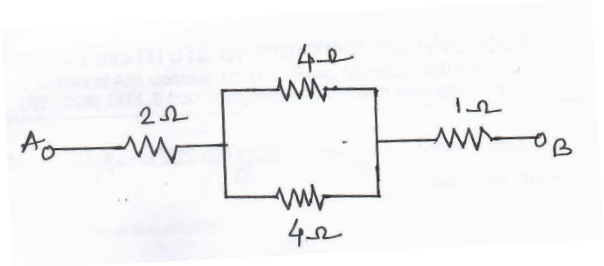
Duration: 03.00 Hours | Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. State and explain the need of mechanical drive.
b. State Ohm's law and explain it.
c. Explain the concept of leakage current.
d. State Kichoff's current and voltage laws.
e. Find the total resistance between terminal A and B in fig.



f. State the advantages and disadvantages of hydraulic system.
g. State the Laws of static and kinetic friction.

Q2 Answer the following questions. (Any 2) **12**

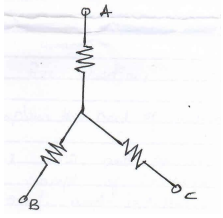
a. Comapre group drive and individual drives.
b. Compare between good conductor, bad conductor and insulator.
c. Define Pneumatic. Describe in brief Charles law.

Q3 Answer the following questions. (Any 2) **12**

a. Explain the operation of the following I) Coupling II) Belt III) Ropes.
b. Define the following terms & state their units I) Current II) Resistance III) Voltage IV) Resistivity V) Power VI) Energy.
c. Define compressor. State the types and explain any one.

Q4 Answer the following questions. (Any 2) **12**

a. Explain the working principle of I) chains II) clutches III) gears.
b. Convert the given star network to delta FIG 2 .



Also write the formula for delta to star conversion.

c. Compare centralized and decentralized compressed air system.

Q5 Answer the following questions. (Any 2) **12**

a. Draw schematic diagram of spur gear teeth and show addendum and dedendum.
b. Explain any one application of Hydraulics in printing technology.
c. List different types of lubricants and explain any two.

Q6 Answer the following questions. (Any 2) **12**

a. State the need for cam and follower mechanism. Explain any two types of cams.
b. Define frictions. State and explain types of frictions.
c. Explain I) coefficient of Friction II) Normal reaction of load.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Printer Mathematics — Code: M106

Duration: 03.00 Hours — Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1.Answer the following questions. (Any10) **20**

a. Cost of six mineral water is Rs 90.how many mineral bottles can be bought for Rs.225.
b. If 52 men can do a piece of work in 35 days. In hold many days will 28 men complete the same work?
c. A train 400 m long is running at speed of 72 km / hr. How much time does it take to cross adestination past?
d. A car is running at a speed of 108 km/h. what distance will it take in 15 seconds.
e. Find out the interest on Rs 8000 at the rate of 7.5 p.c.p.a. for 4 years.
f. Find the compound interest on Rs 7500 at 4% per annum for 2 years compound annually.
g. What percent of 7 is 84.
h. A mobile phone is sold for Rs 3120 at a loss of 4% what will be the gain or loss percent if it sold Rs 3640?
i. Find the length of the longest pole that can be placed in a room of 12m long, 8 m broad and 9 m high.
j. The surface area of a cube is 1734 sq.cm find its value
k. If capacity of a cylindrical took in 1848 m^3 and the radius of its base is 7 m. find the depth of the look?.
l. Find the volume of sphere whose radius is 3cm?
m. Find the mean of the following data :2,4,6,8,10,12
n. Find the mode of the following data : 1,2,3,4,5,5,6,7,8,8,9,10

Q2 Answer the following questions. (Any 3) **12**

a. If x:y =3:4, find (4x+5y) : (5x-2y)
b. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$ then find the value of $\frac{a+b+c}{c}$.
c. If principal = Rs 15,000, Rate =9 p.c.p.a, simple interest = Rs 10,800. Find the period.
d. A certain sum amounts to Rs 12167 in three years at 15% per annum compound axially. Find the sum.
e. Find the mean of the following data:

X	5	15	25	35	45
F	14	23	27	21	15

Q3 Answer the following questions. (Any 3) **12**

a. A metal strip having sides 11x7x5 cm is melted down and minted into coins each of radius 0.7 cm and thickness 0.08cm, assuming no wastage, how many coins can be minted?
b. Find the volume of right circular cone whose radius is 3 cm and height is 4 cm.
c. The price of a refrigerator was slashed from Rs 35,000 to Rs29,400 in the winter season. Find the rate of discount.
d. Anju buys a pair of Nike shoes for Rs 6000 and GST is charged on it at 18%. Find the amount that anju pays for the shoes.
e. Find the modal marks from the following data:

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No of students	7	10	16	32	24	18	10	5

p.t.o

Q4 Answer the following questions. (Any 3) **12**

a. A river is 100 wide. The depth 'd' in is at a distance of 'x' from the back is given by

x:	0	10	20	30	40	50	60	70	80	90	100
d:	0	2	4	7	8	10	9	9	7	5	2

find the area of the cross section by using simians 1/3rd rule.

b. Find the volume of a pyramid whose base is a square of side 120 cm and whose height is 160 cm.

c. Find the median of the following

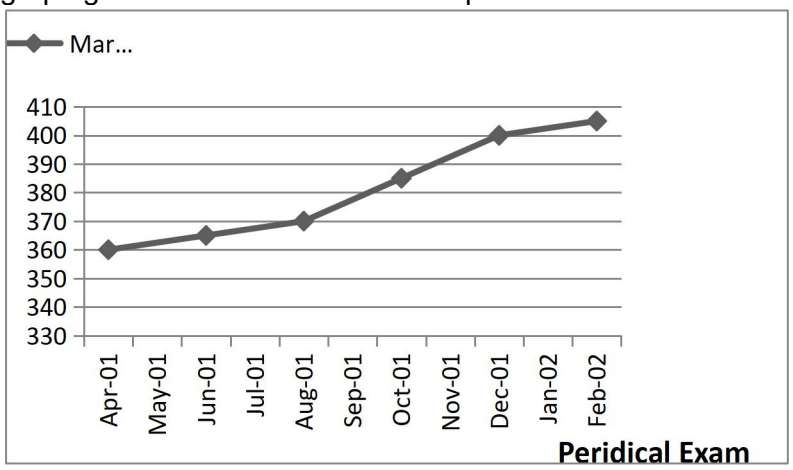
Class involved	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

d. 270 candidates appeared for an examination, of which 252 passed, what is the pass percentage of the candidate.

e. Find the mean and mode of the following data.
4.8, 4.2, 5.1, 4.1, 4.2, 4.3, 4.7, 4.5

Q5 Answer the following questions. (Any 2) **12**

a. In a school the periodical examination are held every second month. In a session during April 2001-March 2002, a student of class IX , appeared for each of the periodical examinations. The aggregate marks obtained by bio in each periodical examination are represented in the line graph given below study the graph given below and answer the question based on it



i. The total number of marks obtained in Feb02 is what percentage of total marks obtained in April 2001.

ii. What are the average marks obtained by the student in all the periodical examination during the session?

iii. What is the percentage of marks obtained by the student in the periodical examinations of August 2001 and Oct 2001 taken together?

b. Find the amount and compound interest on Rs 33280 for three years if the rate of interest is 12.5 % p.a compounded annually.

c. Rajeev bought a car at Rs 1,75,000. if its value depreciates at the rate of 20% per annum, what will its value after three years? Also find total depreciation?

Q6 Answer the following questions. (Any 2) **12**

a. Find the mode and median of the following data

Daily wages (in Rs)	10-14	14-18	18-22	22-26	26-30	30-34	34-38	38-42
No of workers	6	7	8	10	9	6	3	1

b. The radius of a right circular cone is 7m and its height is 12m. find its I) curved surface area II) total surface. III) volume IV) the cost of colouring total surface rated 25 paisa per sq.m

c. The following data gives the monthly expenditure of family.

Item of expenditure	Expenditure (In Rs)
Rent	500
Food	700
Education	250
Clothing	400
Miscellanery	150
	Total = 2000

Represent the data by a pie chart for drawing a pie chart use the following formula = $\frac{value\ of\ expenditure}{total\ value}$ x360 ^{0}

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./ Dec. 2025

Course: Basic Prepress Code: M202

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 5) **20**

a. List 3 primaries of additive color theory & list its one application.
b. List 3 primaries of substractive color theory with its one application.
c. State classification of graphic original.
d. Explain any one digital storage device.
e. Define i) Focal length ii) depth of focus.
f. Write full form of PPI,LPI,DPI and CCD.
g. State advantages of densitometry.

Q2 Answer the following questions. (Any 3) **12**

a. List range of visible spectrum , UV light & Infrared light.
b. State any 4 factors affecting selection of graphic original.
c. Compare between print media and electronic media upto 4 points.
d. List 2 causes & 2 remedies for lens flare.
e. Write 4 characteristics of Hybrid screening.

Q3 Answer the following questions. (Any 3) **12**

a. Describe substractive color theory.
b. Calculate magnification if object placed at 60cm away from lens & focal length 15cm & image is formed at 120cm.
c. Write 3 advantages of digital storage media. And write one example.
d. Compare between digital photography & conventional photography up to 4 points.

Q4 Answer the following questions. (Any 3) **12**

a. Describe additive color theory.
b. Define magnification. Write its formula & explain need of magnification.
c. Write function of prepress departments with suitable example.
d. Explain construction & working of CCD with diagram.
e. Define I) Opacity II) Optical density.

Q5 Answer the following questions. (Any 3) **12**

a. Define I) frequency II) wavelength with diagram.
b. Image size is 10cm X 20cm after printing size is 20cm X40cm. Find magnification factor.
c. With neat diagram, explain Digital camera construction.
d. Compare between AM & FM screening upto 4 points. Explain need of densitometry & list applications of densitometer.

Q6 Answer the following questions. (Any 3) **12**

a. Explain why continuous tone is converted to halftone for printing.
b. List 2 limitation each of I) digital storage II) printed material storage.
c. Write function of screen angles. Write any one example for 4 color process ink.
d. Explain construction of densitometer, with diagram.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Binding & Finishing Code: M203

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Write two applications of die cutting.
b. Write four applications of ISO paper size.
c. Describe principle and working of buckle folding.
d. State four advantages of perfect binding.
e. Write name and purpose of any four Binder's marks.
f. Write four advantages of three knife trimmer.
g. Write name and function of any four parts of single knife guillotine machine.

Q2 Answer the following questions. (Any 2) **12**

a. Explain chemical principle of adhesion.
b. Explain working and construction of three knife trimmer.
c. Describe working of foil stamping machine and write its two applications

Q3 Answer the following questions. (Any 2) **12**

a. Write 4 properties & 2 applications of board.
b. Explain construction and working of gathering machine.
c. Describe working of book sewing machine.

Q4 Answer the following questions. (Any 2) **12**

a. Explain types and purpose of any two adhesives.
b. Describe combination folding machine with diagram.
c. Explain any two inline finishing operations also write their applications (one each)

Q5 Answer the following questions. (Any 2) **12**

a. Write name of 2 securing materials. Also state 4 factors which determine their selection.
b. Write the safety device used in single knife cutting machine and their function (any three).
c. Write the stages involved in automatic perfect binding machine.

Q6 Answer the following questions. (Any 2) **12**

a. Compare knife folding with buckle folding machine (3 points).
b. Describe construction and working of case making machine.
c. Define lamination and compare hot lamination with cold lamination.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Printing Processes I Code: M204

Duration: 02.00 Hours Marks:40

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 4) **16**

a. Define printing and write three applications of printing.
b. Why do we need lay outing? Mention any two types of layouting method.
c. Mention two light sources used for making lithographic image carriers and state two functions of light sources.
d. Elaborate on sheetfed lithographic machine unit.
e. Your group is asked to make a plan to print and make calendars for all students and faculty members. Which binding process will you choose? Why?
f. Mention names of digital cameras & digital printers manufacturers (2 each)

Q2 Answer the following questions. (Any 3) **12**

a. With a flowchart explain the workflow of printing process.
b. What is Nip? Elaborate its application.
c. Explain negative PS plate working.
d. Differentiate between webfed & sheetfed machines.(4 points each)

Q3 Answer the following questions. (Any 3) **12**

a. Mention four conventional printing process.
b. What is non absorbent substrate? Give 2 examples.
c. Mention four lithographic plate making materials.
d. Write printing method for following substrate i) Paper ii) Plastic iii) Cloth iv) Aluminium sheet.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Printing Material Science Code: M207

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Define cellulose fiber. Write four sources of cellulose fiber.
b. State four structural properties of paper.
c. State any two general properties of (I) blotting paper (II) food grade paper.
d. Explain the factors affecting the cost of paper.
e. Explain the key ingredients of ink with their functions.
f. Explain the function of three roll mill used for ink manufacturing with suitable diagram.
g. State the general properties of offset ink. (any four)

Q2 Answer the following questions. (Any 2) **12**

a. Explain in detail the paper manufacturing process with suitable labelled diagram.
b. Explain three surface properties of paper.
c. Define the terms (I) thixotropy (II) viscosity (III) P^H

Q3 Answer the following questions. (Any 2). **12**

a. Define recycled paper. Write two advantages and two disadvantages of recycled paper.
b. Define (I) grammage (II) grain direction (III) dimension stability
c. Define additives. Write the purpose of adding additives in the ink manufacturing.

Q4 Answer the following questions. (Any 2) **12**

a. Define ‘Pulp’. Explain any one type of pulping process in detail and application.
b. Explain three mechanical properties of paper.
c. Define ‘Vehicle’. Write any four properties of ‘vehicle’. (Ink ingredient)

Q5 Answer the following questions. (Any 2) **12**

a. Explain the working of paper board manufacturing machine.
b. State any three properties each of gravure ink and screen ink.
c. Define the terms (I) Adhesion flexibility (II) gloss (III) light fastness

Q6 Answer the following questions. (Any 2) **12**

a. Define seucrity paper. Write any four properties of security paper with example.
b. Explain the liquid ink manufacturing with machine construction diagram (labelling is necessary).
c. Explain any three speciality inks with examples.

Government Institute of Printing Technology, Mumbai

Odd term and theory examination Nov./ Dec. 2025

Course: Image Carrier Plano | Code: M209

Duration: 02.00 Hours | Marks:40

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 4) **16**

a. State and explain working of rotary offset printing.
b. List any four objectives of chemical treatment of aluminum base of plate.
c. List any two reasons behind using imposition schemes.
d. State four requirements of photographic film.
e. Describe importance of pH measurement in offset printing.
f. Differentiate up-to 4 points - positive and negative working offset plates.

Q2 Answer the following questions. (Any 3) **12**

a. State steps involved in PS plate making.
b. Describe importance of plate desensitizing.
c. Explain CTP workflow.
d. List requirements of LASER used in CTP system.

Q3 Answer the following questions. (Any 3) **12**

a. State types of plate surface grainning and describe working of any one.
b. List required properties of aluminum as plate base . (Two points)
c. Describe importance of temperature and relative humidity of plate making and press room.
d. Describe classification of offset plates.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Print Material Handling & Maintenance — Code: M210
Duration: 03.00 Hours — Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 05) **20**

a. List 2 types & 2 materials used for pallet.
b. Write function of pallet association & list 2 pallet associations.
c. Write 4 advantages of lubrication.
d. Write function of warehouse. Write 3 features of good warehouse.
e. What do you mean by initial cost of equipment.
f. Explain breakdown maintenance. List its 2 disadvantages.
g. Explain contract maintaince.

Q2 Answer the following questions. (Any 2) **12**

a. With neat diagram, explain roll handling with AGV. List its 4 advantages.
b. Describe 6 functions of lubricants.
c. What is preventive maintenance. List its 4 advantages.

Q3 Answer the following questions. (Any 2) **12**

a. With neat diagram; explain any one type of bearing. List its 2 advantages & 2 applications.
b. Describe operational procedure for warehouse of sheetfed paper storage.
c. Describe hazardous waste & non hazardous waste, write 3 examples each.

Q4 Answer the following questions. (Any 2) **12**

a. With neat diagram; explain features of counter balanced walkie stacker, write its 2 advantages & 2 applications.
b. Describe following characteristics of lubricants I) wetting ability II) surface tension III) Viscosity.
c. Describe following functions while purchasing new equipment I) cost of installation II) Printing equipment & design consideration.

Q5 Answer the following questions. (Any 2) **12**

a. I) Describe wire container.II) explain misalignment & deflection related to bearing.
b. Draw & explain suitable warehouse layout for roll storage.
c. Write 3 objectives & 3 benefits of TPM.

Q6 Answer the following questions. (Any 2) **12**

a. With neat diagram; describe selective pallet storage racks. Write its 2 advantages.
b. I) Explain how fire protection of warehouse is carried out II) what is overall equipment efficiency, explain.
c. Write need & advantages of personnel training & retraining.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Color Essentials Code: M211

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Compare between color and light upto 4 points.
b. Draw labelled diagram of rod & cone related to human eye.
c. Elaborate device dependent color.
d. Draw diagram of RGB color gamut & list 2 features of color gamut.
e. State 2 advantages & 2 limitations of CIELab space.
f. What is filter ? Write its function.
g. State 2 causes & 2 remedies for moire.

Q2 Answer the following questions. (Any 2) **12**

a. With diagram ; explain Pantone color system. List its 2 advantages & 2 limitations.
b. With neat diagram; explain working principle & construction of colorimeter.
c. List & elaborate 3 attributes of color.

Q3 Answer the following questions. (Any 2) **12**

a. List 3 at Additive color theory. Explain the additive theory with diagram.
b. Describe adaption & its type related to human eye.
c. With diagram ; explain spectral reflection of yellow & magenta ink.

Q4 Answer the following questions. (Any 2) **12**

a. Which color theory is used for printing, describe it.
b. Elaborate Ideal viewer & viewing angler & standard illuminant.
c. With neat diagram; explain construction & working of spectrophotometer.

Q5 Answer the following questions. (Any 2) **12**

a. With diagram, explain spectral transmission & absorption.
b. Explain hue error 7 trapping. Write its formula also.
c. List screen angles for four color printing by offset printing. Also list & explain any 2 type of dot shapes

Q6 Answer the following questions. (Any 2) **12**

a. Calculate ΔE for the following (CIELab model).
i. Sample 1 : L= 65, a= 5, b= 20
Sample 2 : L= 67, a= 5, b= 20
ii. Sample 1 : L= 10, a= -3, b= 20
Sample 2 : L= 12, a= 5, b= 21
b. List 4 requirements of original. List 4 types of originals.
c. Write significance of graphic aid elements. Explain any two of them.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Press Management | Code: M401

Duration: 03.00 Hours | Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Write 4 functions of sales department.
b. Explain 'planning' function of management.
c. Explain organizing, its importance in press related to management function.
d. State & explain law of demand.
e. Explain examples of copy right.
f. Write ISO standards for printing paper.
g. Define control chart, list its 2 advantages.

Q2 Answer the following questions. (Any 2) **12**

a. Write function of controlling & monitoring related to press management.
b. Explain concept of six sigma. Also write its 4 advantages.
c. Describe objectives of statistical print process control.

Q3 Answer the following questions. (Any 2) **12**

a. With neat block diagram, explain structure of large scale printing press.
b. Elaborate the concept of 5S. List its 3 advantages.
c. Explain process capability.

Q4 Answer the following questions. (Any 2) **12**

a. Write 6 functions of production department.
b. Elaborate law of diminishing utility also explain the concept of elasticity.
c. Elaborate concept of Quality. Quality cost & quality assurance.

Q5 Answer the following questions. (Any 2) **12**

a. Write any 6 provisions of factory act.
b. Describe trade unionism & leadership.
c. Elaborate any one type of chart for attributes.

Q6 Answer the following questions. (Any 2) **12**

a. Write 3 advantages & 3 limitations of single owner business organization.
b. Describe classification of production system.
c. With neat diagram explain any one type of control chart for variable.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Costing & Estimating Code: M402

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Write four factors to be considered for costing of a notebook.
b. To calculate per hour cost of four colour offset printing machine, which four factors should be checked?
c. Which four factors should be mentioned in delivery report? Mention any four.
d. Write four technical specifications of 'Envelope' job.
e. Write two British & two ISO Paper sizes.
f. State two advantages & two limitations of ISO properties.
g. Calculate weight (kg) of 2 reams of 60 gsm A4 size paper.

Q2 Answer the following questions. (Any 2) **12.**

a. For job work of book printing, what six machines should a printing press posses?
b. Explain purpose and four contents of job docket.
c. Mention any six things which an estimator should know about printing business.

Q3 Answer the following questions. (Any 2). **12**

a. State six factors to be considered to calculate life of newspaper web offset machine.
b. Describe the purpose of GST & its two provisions.
c. Calculate ink in kg to print 20,000 posters from one side in cyan ink having print area 15"x20" and text matter only; using offset process.

Q4 Answer the following questions. (Any 2) **12**

a. With reference to printing industry; state three examples each of fixed cost and variable cost.
b. Calculate weight (Kg) of paper for 210 gsm, 20"x30', 25 reams. Also calculate cost of paper if rate is Rs.110/ kg .
c. Write six technical specifications for prepress, press and post press operations of a 'carton for cake' job.

Q5 Answer the following questions. (Any 2) **12**

a. Binding cloth is available in 600mm width and 2m length. Book size is 180mm X305 mm (open size including spine) consider 1 cm turn in allowance from all sides. How many books can be full bound in one roll of cloth.
b. Calculate number of A2 size plates required to print 48 pages 4 color booklet of A4 size.
c. Write six technical specifiaction for'calender' job.

Q6 Answer the following questions. (Any 2) **12**

a. Explain with one example each (related to printing industry), time rate & work rate system.
b. Prepare a sample of material requisition form with at least four entries in it.
c. How many 20"X28" size reams are required to print 5000 books of 128 leaves of 9.75"X 13.75" size of 75 gsm. Also calculate weight in kg and total cost of paper if rate is Rs.105 per kg.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course:Environmental Science & Disaster Management Code: M404

Duration: 02.00 Hours Marks:40

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 4) **16**

a. Describe classification of natural resources.
b. What is environmental pollution? State its any two sources.
c. Define VOC. What caused increase in VOC in gravure and flexographic press?
d. Write four reasons of water pollution in industrial areas.
e. State two hazards found in food because of pollution.
f. Define noise pollution. List any two sources of noise pollution.

Q2 Answer the following questions. (Any 2) **12**

i. Describe any two remedial steps taken to prepare water, air and noise pollution in industrial areas.
ii. State three problems each related to natural & alternate resources.
iii. Write any six safety measures in printing industry as recommended by factory act 1948.

Q3 Answer the following questions. (Any 2) **12**

a. Explain scope of environmental study in printing industry.
b. Differentiate- physical and chemical hazards.
c. List 2 measures recommended to take precautions in case of any four disasters.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Gravure Printing Process Code: M501

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Describe any four application area of gravure printing.
b. State factors affecting doctor blade angle. Also write effect of variation in doctor blade angle on inking.
c. List 2 materials used in impression roller surface making. Also write applications of different hardness values of impression roller.
d. State 4 examples each of resin and solvents used in gravure ink.
e. Differentiate solvent based gravure ink from water based up to 4 points.
f. Write 2 causes and two remedies of streaks of inks during printing

Q2 Answer the following questions. (Any2) **12**

a. Draw a complete flow chart of gravure cylinder making process. (Any) one process.
b. Differentiate upto 6 point, chemical etching and electronic engraving.
c. Describe with diagram, working of ESA unit.

Q3 Answer the following questions. (Any 2) **12**

a. Compare an any 6 basis gravure with offset and Flexographic printing process.
b. Describe construction of integral & demountable shaft gravure cylinders.
c. Describe the working of electronic engraving and state 3 advantages over chemical etching.

Q4 Answer the following questions. (Any 2) **12**

a. State any 6 properties of nickel & copper metals.
b. Describe any one chemical etching process.
c. Write composition of gravure inks and function of its constituents.

Q5 Answer the following questions. (Any 2) **12**

a. Write effect of any six factors of electroplating on metal deposition.
b. Draw schematic diagrams of different cell geometries and one application of each.
c. With suitable diagram describe construction of doctor blade holder assembly

Q6 Answer the following questions. (Any 2) **12**

a. With suitable diagram describe construction and working of electroplating unit.
b. Describe stage involved in indirect laser engraving.
c. Draw diagram showing doctor blade tip shape. Also list any four materials used in doctor blade manufacturing.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Flexographic Printing Process Code: M502

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Write 4 features of flexography.
b. Describe 2 application area of flexography in details.
c. Write the effect of plate thickness on its elongation and state formula to find plate's elongation.
d. Write 4 features of an inline flexo press.
e. Differentiate reverse angle doctor blade system from the forward angle.
f. State any 4 required properties of plastics film for printing.
g. Write 4 limitations of using solvent based ink.

Q2 Answer the following questions. (Any 2) **12**

a. State stages involved in thermal ablation CTP system.
b. Describe construction and advantages of an integral shaft plate cylinder.
c. Explain formulation of solvent based flexographic ink.

Q3 Answer the following questions. (Any 2) **12**

a. Tabulate the comparison among flexography, gravure and offset printing using 6 parameters.
b. State stages involved in liquid photo polymer plate making.
c. Draw schematic labelled diagram of stack and CIC flexographic processes.

Q4 Answer the following questions. (Any 2) **12**

a. Draw schematic diagram of processed flexographic plate and state function of each port.
b. Describe construction and working of one hybrid flexo press.
c. Draw schematic diagram engraved anilox roller surface and show -cell wall, cell land, opening engraving angle depth to opening ratio, cell count.

Q5 Answer the following questions. (Any 2) **12**

a. Draw schematic diagram of unprocessed flexographic plate and state function of each layer.
b. Describe construction and working of an inline die cutting unit.
c. Draw schematic diagram showing any 3 cell geometries along with one function.

Q6 Answer the following questions. (Any 2) **12**

a. Write CMYK screen angles for flexography and state any 4 required physical properties of plate material.
b. Describe construction and limitations of demountable shaft plate cylinder.
c. Draw schematic diagram of closed chamber inking system and describe its working.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Plano Sheetfed Printing Code: M504

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Describe the principle of lithographic offset printing process.
b. List 4 applications of lithographic offset and dry offset (two each).
c. Write function of pil height governor used in feeding unit.
d. Draw a digram of conventional dampning system.
e. List four parts & their purpose, related to feeding unit.
f. Describe causes and solution of set- off and scum.
g. Explain any four components of test form.

Q2 Answer the following questions. (Any 2) **12**

a. Describe working of single color offset machine with diagram.
b. Describe components of dampning solution with their purpose.
c. Describe any two types of grippers used in feeding system of offset machine.

Q3 Answer the following questions. (Any 2) **12**

a. Describe any one type of dampning system with diagram.
b. Define and explain purpose of undercut and cylinder gap on plate cylinder.
c. State purpose of star target and color control bar.

Q4 Answer the following questions. (Any 2) **12**

a. Write need and function of two sheet detector and no sheet detector.
b. Explain with diagram construction of inking system.
c. Explain any two types of drying system.

Q5 Answer the following questions. (Any 2) **12**

a. Explain function of site lay and front lay.
b. Describe causes and remedies of heat generation in inking system.
c. Explain function of transfer cylinder.

Q6 Answer the following questions. (Any 2) **12**

a. Describe concept of sheet transport and control.
b. Explain ink water balance and heat generation in inking system.
c. Describe construction and working of metal decoding presses

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Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Press Work Web | Code: M506

Duration: 03.00 Hours | Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Write four applications of web offset printing.
b. Differentiate up to 4 points - high velocity hot air and IR dryer.
c. Write working principle of former folder.
d. With schematic describe working of compensator of web path.
e. List any four ancillary operation along with one purpose each .
f. State working principle of stroboscope and electronic - color registration.
g. Draw neat schematic of out of round and telescopic rolls.

Q2 Answer the following questions. (Any 2) **12**

a. Compare webfed and sheetfed process up to six points.
b. Draw schematic of single multiple and revolving reel stands.
c. Describe working and advantages of jaw folder.

Q3 Answer the following questions. (Any 2) **12**

a. Describe working of revolving reel stand.
b. With schematic describe working of any one chill roller.
c. Describe working of electronic color registration system.

Q4 Answer the following questions. (Any 2) **12**

a. With schematic describe working of Y-type Web press.
b. Define web tension and state any four factors affecting it.
c. Write one characteristic, two causes and two remedies each for web wrinkles and web break.

Q5 Answer the following questions. (Any 2) **12**

a. Describe following web breaks systems - expanding shaft, tilt lock and chuck system.
b. State working principle and two purpose of bottle, plates and silicone application.
c. Define fan-out. State two causes behind fan-out and describe technique used to compensate it.

Q6 Answer the following questions. (Any 2) **12**

a. With schematic describe working of flying speed splicer.
b. Describe working of combination folder with diagram.
c. Compare up-to 3 points, working of hard on hard sitters, sprocket punching, rotary scissor.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Digital Printing Code: M507

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. Differentiate analog printing from digital printing up to 4 points.
b. State any 4 limitations of digital printing.
c. State any 4 requirements of OPC.
d. Describe any 4 application areas of large format printing.
e. What is SWOP? State its any 3 features.
f. Differentiate AM from FM screening up to 4 points.
g. Write 2 features each of software and hardware RIP.

Q2 Answer the following questions. (Any 2) **12**

a. Describe formulation of toner used in laser printer. Also define digital printing.
b. State working principle and describe application area of magnetographic printing.
c. State working principle of inkjet printing and describe classification of inkjet printing technologies.

Q3 Answer the following questions. (Any 2) **12**

a. Write working principle of ion deposition printing, also state stages in ion deposition printing.
b. State any 4 features of large format printing and list printing technologies used in large format printing.
c. Describe elements used in a SWOP specified color control bar.

Q4 Answer the following questions. (Any 2) **12**

a. State printing, general and ink related technical.specifications of large format digital printer.
b. Compare sublimation with heat transfer printing up to 6 points.
c. Describe functions of RIP.

Q5 Answer the following questions. (Any 2) **12**

a. Compare Print On Demand digital printing with Web- to-Print up to 6 points.
b. State any six features of piezoelectric printer.
c. Write any six features of GRACOL specification system.

Q6 Answer the following questions. (Any 2) **12**

a. State any six features of thermal inkjet printing.
b. List any six substrates, along with 2 technical specifications, used in large format digital printing..
c. Describe SWOP specifications regarding screen ruling, screen angle and film properties.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./ Dec. 2025

Course: Electronic Color Correction. Code: M508

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1. Answer the following questions. (Any 5) **20**

a. State four characteristics of light based colour theory.
b. Describe the 2 functions of I) Rod II) Cone.
c. List four graphic file format along with full form.
d. What is DPI? How it is related to file size? State one example.
e. State four technical specifications of scanner.
f. Explain how drum scanner works.
g. State name of two color filters. Also state which color they separate respectively.

Q2 Answer the following questions. (Any 2) **12**

a. Explain how value and chroma are related to the color reproduction.
b. Define color management. Describe two characteristics of it.
c. Write name and purpose of any three parts of densitometer

Q3 Answer the following questions. (Any 2) **12**

a. Describe ideal and actual color / light reflection by process cyan and process magenta inks. Draw a digaram.
b. State two points each about L,a,b related to CIELab model.
c. Describe three technical specifications of spectrophotometer.

Q4 Answer the following questions. (Any 2) **12**

a. List six points in preflight check.
b. Explain the meaning of device dependent and device independent color models.
c. Explain the meaning of hue error and dot gain.

Q5 Answer the following questions. (Any 2) **12**

a. Describe any three tool in the adobe photoshop software.
b. Explain any three features of test chart.
c. Calculate delta E for the following reading and state where it is acceptable or not

L1=23	a1=+15	b1 =+75
L1=25	a1=+16	b1 =+73

Q6 Answer the following questions. (Any 2) **12**

a. Differentiate between additive and substractive color theory (upto 4 point).
b. Explain any two rendering intents of color management.
c. State names and one characteristics each of any three graphics software.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Flexible packaging Code: M509

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary

Q1 Answer the following questions. (Any 5) **20**

a. List 4 properties of polypropylene also list its 2 applications & draw its structure.
b. Define polymerization. Explain additive polymerization.
c. What is Bag in box. Describe.
d. Elaborate shrink wrapping with diagram.
e. List 4 properties of package required for food packaging.
f. Write packaging material for the following I) cheese II) cold drink III) Butter IV) milk.
g. Explain any one type of smart label.

Q2 Answer the following questions. (Any 2) **12**

a. Compare between thermostat and thermoplastic up to 6 points.
b. With neat diagram; explain dry lamination process.
c. Draw & explain layers of Aluminum Barrier lamitubes. Also write its 2 applications.

Q3 Answer the following questions. (Any 2) **12**

a. With neat diagram, explain bottle manufacturing process.
b. With neat diagram; explain function layers of tetrapak. Write its 2 applications.
c. Explain vaccum packaging method used for meat packaging.

Q4 Answer the following questions. (Any 2) **12**

a. List any 4 additives used in plastic manufacturing. Write function of any two of them.
b. With neat diagram, elaborate blister packaging method. List its 2 applications.
c. Write 2 applications each of following method. I) stretch wrapping II) vaccum packaging III) aseptic packaging.

Q5 Answer the following questions. (Any 2) **12**

a. With neat diagram. Explain wet lamination process.
b. With diagram ; explain vertical form fill seal machine. Lst its 2 applications.
c. What is MAP ? Write its 2 applications. List its 2 advantages.

Q6 Answer the following questions. (Any 2) **12**

a. Elaborate structure of closure liner. Also explain any one type of closure.
b. Explain any one method of sterilization of package.
c. Elaboarate edible packaging. List its 2 applications & 2 advantages.

Government Institute of Printing Technology, Mumbai

Odd term end theory examination Nov./Dec. 2025

Course: Basic Science - I Code: R103

Duration: 03.00 Hours Marks:80

Instructions to Candidates:

1. Attempt all questions and illustrate your answer with neat sketches wherever necessary.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary.

Q1. Answer the following questions. (Any 8) **16**

a. What is Error?
b. Define term Voltmeter and Ammeter.
c. Define CGS and MKS system of units.
d. Define viscosity?
e. Define capillary action.
f. Write the names of three modes of transfer of heat.
g. State Gay-Lussac law.
h. Write the long form of LASER.
i. Define diffraction of light.
j. Define polarization of light.
k. An accelerated electron emits a radioman with a frequency 5×10^{18} Hz. Calculate energy of electron ($b = 6.62 \times 10^{-34}$ Js)

Q2 Answer the following questions. (Any 4) **12**

a. Distinguish between Accuracy and Precision.
b. Differentiate between fundamental and derived quantities (any 3 point).
c. Calculation of least count for vernier, micrometer.
d. What is the difference between stress and strain?
e. Explain : Effect of temperature and impurities on surface tension.
f. State and explain Hook's law

Q3 Answer the following questions. (Any 4) **12**

a. Explain Newton's law of viscosity.
b. Distinguish between cohesive and adhesive force.
c. Pure water rises to a height of 1.5cm in a capillary tube of diameter 1 mm, find the surface tension.if density of water is 1000 kg / m^3. Explain.
d. Explain law of thermal conductivity.
e. Explain study of absolute temperature.
f. State and explain first law of thermodynamics.

Q4 Answer the following questions. (Any 4). **12**

a. Distinguish between isobaric and isochroric process.
b. Explain the universal gas equation.
c. Give the list of good and poor conductors of heat.
d. Define : Different physical quantities associated with wave form.
e. Distinguish between constructive and destructive interfence of light.
f. State any three applications of LASER

Q5 Answer the following questions. (Any 4) **16**

a. Explain the concept of population inversion.
b. Explain principle of superposition of waves.
c. State and explain Snell's law of refraction.
d. State any four properties of photon.
e. Explain photoelectric effect?
f. State any 3 characteristics of X-ray.

p.t.o.

Q6 Answer the following questions. (Any 2) **12**

a. State and explain Huygen's wave theory of light.

b. State Young’s experiment and conditions for stationary interference pattern.

c. Write any six applications of X-rays.
