



28274

2E3201

Roll No. _____

Total No. of Pages: 2

2E3201

B. Tech. II - Sem. (Main / Back) Exam. - 2026
2FY2-01 Engineering Mathematics - II

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL**PART – A**

[10×2=20]

(Answer should be given up to 25 words only)**All questions are compulsory**

- Q.1 What is an orthogonal matrix? Give one property.
Q.2 Define the Rank-Nullity Theorem.
Q.3 Find the general solution of $y = xp - p^2$.
Q.4 Define an exact differential equation.
Q.5 What is the Cauchy-Euler theorem?
Q.6 Solve: $y''' - y = 0$.
Q.7 Find the order and degree of $p^2z - q^2py = 0$.

Q.8 Give examples of linear and non-linear PDE.

Q.9 Classify the PDE: $y u_{xx} + 2x u_{xy} + y u_{yy} = 0$.

Q.10 Define the wave equation.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1 Verify the Cayley-Hamilton theorem for the matrix $\begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$.

Q.2 Find the eigenvalues and the eigenvectors of the matrix $\begin{bmatrix} 2 & 4 \\ 3 & 1 \end{bmatrix}$.

Q.3 Solve: $\frac{dy}{dx} = \frac{x+y \cos x}{\sin x}$.

Q.4 Solve: $y'' + y = \sin x$.

Q.5 Solve the Lagrange equation: $x(y-z)p + y(z-x)q = z(x-y)$.

Q.6 Formulate the PDE by eliminating arbitrary functions: $z = f(x+ct) + g(x-ct)$.

Q.7 Solve the PDE using separation of variables $u_x + u_y = 0$ with $u(0, y) = 5e^{2y}$.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 For what values of λ and μ do the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ have

(i) no solution, (ii) unique solution, (iii) infinite solutions.

Q.2 Solve the Bernoulli differential equation $y^2 + x^2 \frac{dy}{dx} = xy \frac{dy}{dx}$.

Q.3 Solve using variation of parameters: $y'' + y = \tan x$.

Q.4 Solve the PDE $(p+q)(px+qy) = 1$.

Q.5 A rod of length 1 with insulated sides is initially at uniform temperature $K^\circ\text{C}$. Its ends are kept at 0°C . Find the temperature distribution.



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2E3202

Roll No. _____

Total No. of Pages: **2****2E3202****B. Tech. II - Sem. (Main / Back) Exam. - 2026****2FY2-03 Engineering Chemistry****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Why ammonia buffer is added in EDTA based complexometric titration?
- Q.2 Write the name and chemical formula of any two coagulants.
- Q.3 Define Octane number.
- Q.4 Write qualities of good fuel.
- Q.5 Write any four functions of lubricating oils.
- Q.6 Define viscosity index.
- Q.7 What are the basic constituents of cement?
- Q.8 What is Pilling-Bedworth rule?
- Q.9 Write down chemical reaction for the preparation of Aspirin.
- Q.10 What is annealing of glass?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Calculate the quantity of Lime and Soda required for softening 50,000 litres of water containing $\text{Ca}(\text{HCO}_3)_2 = 8.1 \text{ mg/L}$; $\text{Mg}(\text{HCO}_3)_2 = 7.5 \text{ mg/L}$; $\text{CaSO}_4 = 13.6 \text{ mg/L}$; $\text{MgSO}_4 = 12.0 \text{ mg/L}$; $\text{MgCl}_2 = 2.0 \text{ mg/L}$ and $\text{NaCl} = 4.7 \text{ mg/L}$.
- Q.2 The ultimate analysis of coal gives: C = 84% ; S = 1.5% ; N = 0.6% ; H = 5.5% ; O = 8.4%. Calculate the gross and net calorific values of the sample.
- Q.3 Explain the preparation, properties and uses of a coal gas with diagram.
- Q.4 Explain thick layer mechanism of lubrication.
- Q.5 Discuss the property of setting and hardening of cement.
- Q.6 Differentiate between SN^1 and SN^2 reactions.
- Q.7 Explain the sacrificial anodic method to minimize corrosion.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 What is softening of water? Describe softening of water by Zeolite process with diagram. [2+8=10]
- Q.2 What is carbonization of coal? Describe the Otto-Hoffman's by product oven method of coke manufacturing with diagram. [2+8=10]
- Q.3 What do you mean by viscosity of lubricating oil? Describe the determination of viscosity of lubricating oil using Redwood Viscometer No 1 also draw the labelled diagram of viscometer. [2+8=10]
- Q.4 What is Paracetamol drug? Describe the synthesis, properties and uses of Paracetamol. [2+8=10]
- Q.5 What is corrosion? Describe the mechanism of dry corrosion by taking suitable example. [2+8=10]



25112

2E3203

Roll No. 26Total No. of Pages: 4**2E3203****B. Tech. II - Sem. (Main / Back) Exam. - 2026**
2FY2-02 Engineering Physics**Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 In Newton's Ring experiment, explain why the central fringe is dark in reflected light? [2]
- Q.2 What do you understand by Bragg's condition for x-ray diffraction? [2]
- Q.3 Define group velocity. [2]
- Q.4 Give two differences between Temporal coherence and Spatial coherence. [2]
- Q.5 What do you mean by 'visibility as a measure of coherence'? [2]

- Q.6 Mention unit(s) of Einstein's coefficients. [2]
- Q.7 Give two properties of Laser. [2]
- Q.8 Write expression for Fermi-Dirac Distribution function. Given its value at $E = E_f$. [2]
- Q.9 Write Laplace equation and mention its one application. [2]
- Q.10 Mention physical significance of 'Poynting vector' in brief. [2]

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 In Newton's ring experiment by reflected light, the diameter of the 4th and 12th dark rings are 0.4 cm and 0.7 cm respectively. Find the diameter of 20th dark ring. What will be the order of dark ring which is formed where thickness of air film is equal to wavelength of light used? [2+2=4]
- Q.2 Derive an expression for resolving power of a Grating. [4]
- Q.3 Derive the Schrödinger's time independent wave equation. [4]
- Q.4 What is spectral purity? Deduce an expression for coherence length and coherence time in terms of spectral purity. [1+1½+1½=4]
- Q.5 Explain the essential requirement for production of laser. How could probability of stimulated emission be increased? [2+2=4]
- Q.6 An electric field of 100 V/m is applied to a sample of n-type semiconductor whose Hall coefficient is $-0.0125 \text{ m}^3\text{C}^{-1}$. Determine the current density in the sample assuming $\mu_s = 0.36 \text{ m}^2\text{V}^{-1}\text{s}^{-1}$. [4]
- Q.7 Explain Solenoidal vector field and Irrotational field. Give one example of each. [1+1+1+1=4]

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain the working of Michelson's Interferometer. How circular fringes be produced with it? Also obtain the expression for radii of these circular fringes. [3+3+4=10]
- Q.2 Solve Schrödinger's equation for a particle trapped in 3D cubical box of dimension 'L'. Also explain the following - [6+2+2=10]
- (i) Degeneracy
 - (ii) Order of degeneracy
- Q.3 With schematic diagram, explain the structure and operation of optical fiber. Explain the following terms - [6+4=10]
- (i) Critical Angle
 - (ii) Numerical Aperture
 - (iii) Acceptance angle and Acceptance cone
- Q.4 What are the basic requirements of semi-conductor laser? Draw its label diagram and explain its working with necessary theory. [4+6=10]
- Q.5 Deduce the Maxwell's equation in integral and differential form for free space and discuss their physical significance. [10]

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23721

2E3204

Roll No. _____

Total No. of Pages: 2

2E3204

B. Tech. II - Sem. (Main / Back) Exam. - 2026
2FY1-05 Human Values

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 State the meaning of human values and ethics.
Q.2 What do you mean by right understanding?
Q.3 What does Natural acceptance means?
Q.4 Define respect and trust.
Q.5 What do you mean by Sanyam (self-regulation) and Svasthya (health)?
Q.6 What is the meaning of Justice?
Q.7 What do you mean by the term harmony?

- Q.8 Define Prosperity.
- Q.9 What does holistic technology means?
- Q.10 What is the comprehensive human goal?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Discuss the programme for continuity of happiness.
- Q.2 Briefly discuss the process and content of self-exploration.
- Q.3 Explain the activities of the four orders of nature.
- Q.4 Discuss the five dimensions of human endeavour in the society.
- Q.5 Differentiate between human consciousness and consciousness.
- Q.6 Discuss the need for value education in technical institutions.
- Q.7 Distinguish between belief and understanding.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Activities of imaging, analysing and selecting are constantly taking place in “T”. Discuss.
- Q.2 Discuss the broad holistic criteria for evaluation of technologies, production system and management models.
- Q.3 How does co-existence in existence express itself at different levels of living of human being? Explain.
- Q.4 What do you understand by definitiveness of Ethical Human Conduct?
- Q.5 Critically examine the issues in professional ethics in the current scenario.
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23182

2E3205

Roll No. _____

Total No. of Pages: **2****2E3205****B. Tech. II - Sem. (Main / Back) Exam. - 2026**
2FY1-04 Communication Skills**Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 What is 'encoding'?
- Q.2 What is verbal communication?
- Q.3 What is downward communication?
- Q.4 What is passive voice?
- Q.5 What is a conditional sentence?
- Q.6 What is a paragraph?
- Q.7 Who wrote 'Where the Mind is without Fear'?
- Q.8 Give any two qualities that the father wants his son to follow.
- Q.9 What happens to Pahom at the end of the story?
- Q.10 Why does the author think that divine justice has been delivered to him?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Discuss various types of communication with examples.
- Q.2 Write a report on a National Hackathon organized in your college, on the theme “*Innovative Solutions for Smart Cities*”. Highlighting its objectives, participation, key events and outcomes.
- Q.3 Write the summary of the poem ‘Where the Mind is without Fear’ by Rabindranath Tagore.
- Q.4 Change the following sentences from active to passive voice -
 - (a) The teacher explains the lesson clearly.
 - (b) The students completed the project on time.
 - (c) The company will launch a new product next month.
 - (d) She is writing a letter to her friend.
 - (e) The committee has approved the proposal.
- Q.5 Write the plot of the story Luncheon by Somerset Maugham.
- Q.6 Write the components of building a paragraph.
- Q.7 Write importance of Communication Skills in present scenario.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain the communication process in detail with diagram.
- Q.2 As a B.Tech graduate, prepare a professional Curriculum Vitae (CV) for the post of Software Engineer at Infosys Ltd., including your personal details, educational qualifications, relevant experience, technical and soft skills, projects, and achievements.
- Q.3 Write a character sketch of Pahom in the story ‘How Much Land Does a Man Need?’ by count Leo Tolstoy.
- Q.4 Explain the theme of universal brotherhood in ‘No Men are Foreign’ by James Kirkup.
- Q.5 Write a formal business letter to the Sales Manager of ABC Electronics Pvt. Ltd. placing an order for computer equipment for your college. Include all necessary details such as product specifications, quantity, delivery schedule, and payment terms, following the standard business letter format.



24253

2E3206

Roll No. _____

Total No. of Pages: 2**2E3206****B. Tech. II - Sem. (Main / Back) Exam. - 2026
2FY3-07 Basic Mechanical Engineering****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define dryness fraction of steam.
- Q.2 Differentiate between fire-tube and water-tube boilers based on heat transfer mechanism.
- Q.3 What is priming in centrifugal pumps?
- Q.4 What is the function of carburetor in IC engine?
- Q.5 Define Ton of Refrigeration.
- Q.6 What is the function of mould in manufacturing?
- Q.7 What are different ways for mechanical power transmission?
- Q.8 Why open belt drive is used?

- Q.9 Differentiate between brazing and soldering based on temperature range and strength.
- Q.10 What are the objectives of heat treatment process of steel?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Differentiate between impulse and reaction turbines.
- Q.2 Describe the working principle of a double acting reciprocating pump.
- Q.3 What are the functions of major components of IC engines? Explain in brief.
- Q.4 Describe the types of belt drives with neat sketches.
- Q.5 Explain the metal casting process and its steps.
- Q.6 Differentiate between petrol and diesel engines.
- Q.7 What is refrigerant? Explain about the important properties of a good refrigerant.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain the formation of steam with a graph. Describe the working of any high-pressure boiler with neat and labelled diagram.
- Q.2 Classify the different types of IC engine. Explain the working of 2-stroke petrol engine with neat sketch.
- Q.3 Explain vapour absorption refrigeration system with neat sketch.
- Q.4 What are the common stages of heat treatment process? Explain the hardening heat treatment process with its advantages.
- Q.5 Write short note on following (any three) :
- (a) Coefficient of Performance (COP) of refrigeration system
 - (b) Arc welding process
 - (c) Compound Gear Train
 - (d) Gas turbine power plant



23732

2E3207

Roll No. _____

Total No. of Pages: 4

2E3207

B. Tech. II - Sem. (Main / Back) Exam. - 2026
2FY3-06 Programming for Problem Solving

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

- Q.1 What is the stored program architecture?
- Q.2 Define primary memory and secondary storage with examples.
- Q.3 What is the difference between sequential and direct access methods?
- Q.4 What are high-level programming languages? Give examples.
- Q.5 What is the role of pseudo code in algorithm representation?

- Q.6 What are the four common radix values in computer systems?
- Q.7 What is the difference between global and local variables in C?
- Q.8 How does the size of operator work in C?
- Q.9 Explain the purpose of a function prototype in C programming.
- Q.10 What is the significance of the #include pre-processor directive?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 What is Von Neumann architecture? Discuss the role of primary memory in computer systems and its relationship with secondary storage.
- Q.2 What is an Array in C? Write a C program to find the largest and smallest numbers in an array.
- Q.3 What is the significance of the & (address-of) and * (dereference) operators in relation to pointers?
- Q.4 Define a Structure named "Student" with roll_no, name and percentage as members, read the data of 3 students from user and display them in proper format.
- Q.5 What are storage classes in C, and why are they important? How do they affect the behavior of variables?
- Q.6 Write detailed notes on how algorithms can be represented using flowcharts and pseudo code with an example.
- Q.7 Discuss the differences between procedural, object-oriented, and assembly-level programming. Provide examples where each is used.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Answer the following - [3+3+4=10]
- (a) How do computers store and process text, numbers, and special characters?
 - (b) Compare and contrast high-level, assembly, and low-level languages.
 - (c) Explain ASCII, Unicode, and EBCDIC encoding systems.
- Q.2 Answer the following - [5+5=10]
- (a) If a computer's primary memory size is increased, will it reduce the need for secondary storage? Why or why not?
 - (b) A company is experiencing slow data retrieval. Should they switch from sequential to direct access storage? Explain with technical justifications.
- Q.3 Convert following numbers as required an [3+3+4=10]
- (i) $(45.32)_{10} = ()_2 = ()_8 = ()_{16}$
 - (ii) $(29.36)_8 = ()_2 = ()_{10} = ()_{16}$
 - (iii) Subtract $(101011)_2$ from $(110011)_2$ using 1's and 2's complement.
- Q.4 What is Function in C? Write detailed notes on parameter passing in functions, highlighting differences between call-by-value and call-by-reference using suitable example. [10]
- Q.5 Write a C program that reads a list of student names and their scores from a file, calculates the average score and stores the names of students scoring above the average in another file. [10]

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23749

2E3208

Roll No. _____

Total No. of Pages: **4****2E3208**

B. Tech. II - Sem. (Main / Back) Exam. - 2026
2FY3-09 Basic Civil Engineering

Time: 3 Hours**Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____ 2. NIL _____

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

- Q.1 What are the two basic principles of surveying?
- Q.2 Draw the traffic symbols for “Side road left” and “Narrow road”.
- Q.3 What is header bond in brick masonry? Also, state the nominal size and actual size of a modular brick.
- Q.4 Write one unique advantage of road transport compared to the other modes of transportation.
- Q.5 What is floor area ratio formula?

- Q.6 What is diagonal scale?
- Q.7 What is DPC in a building?
- Q.8 Write any five roles of Civil Engineering in Society.
- Q.9 What do you understand with Global Warming & Climate Change?
- Q.10 What is the basic concept of R.C.C.?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 What are the impacts of infrastructural development on the economy of a country?
- Q.2 Tabulate the differences between “Surveyor Compass” and “Prismatic Compass”. Convert the following reduced bearings (RB): (a) N 32° 30' E; (b) S 42° 40' E; (c) S 60° 30' W; (d) N 72° 50' W; (e) S 45° 45' W to Whole Circle Bearings (WCB).
- Q.3 What are the basic components of a building? What are the factors to be considered during the selection of a building site?
- Q.4 Discuss in detail different modes of transportation with their merits and demerits.
- Q.5 What are the various instruments used in chain surveying? Explain the principle of levelling. What is differential levelling?
- Q.6 What do you understand by built-up area and super built-up area? Write detail note on building byelaws.
- Q.7 Discuss the importance of biodiversity and the basics of species classification. Explain how environmental acts and regulations help in biodiversity conservation with suitable examples.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain methods of solid waste management, including classification, collection, recycling and disposal techniques such as sanitary landfills and energy recovery. Also discuss rainwater harvesting and strategies for water conservation and reuse.
- Q.2 What is the difference between self-reading staff and target staff? Write detail note on EDM distance measurement methods.
- Q.3 What is the difference between Magnetic Bearing and True Bearing? The bearing of line AB is 195° and that of line CB is $255^\circ 45'$. Find the included angle ABC.
- Q.4 What are the general causes of road accidents? What are the important traffic rules to follow to ensure safety while driving?
- Q.5 The following consecutive readings were taken with a dumpy level -

Points	P	I ₁	I ₂	Q
B.S (m)	2.365	0.685	1.745	
F.S.(m)		1.235	3.570	2.340

RL of “P” is 100m find RL of “I₁”, “I₂” and “Q” using Rise and Fall method.

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24293

2E3209

Roll No. _____

Total No. of Pages: **2****2E3209****B. Tech. II - Sem. (Main / Back) Exam. - 2026**
2FY3-08 Basic Electrical Engineering**Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define Superposition Theorem.
- Q.2 What are peak and r.m.s. values?
- Q.3 Define Ideal Transformer.
- Q.4 What are rotating magnetic fields?
- Q.5 What do you know about semiconductor PN junction Diode?
- Q.6 Give Layout of LT Switchgear.
- Q.7 Define Thevenin's Theorem.
- Q.8 What do you mean by power factor?

- Q.9 What are synchronous generators?
Q.10 Draw equivalent circuit of practical transformer.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Define and explain Maximum Power Transfer Theorem.
Q.2 Define real, reactive and apparent power.
Q.3 Derive and explain EMF equation of transformer.
Q.4 Explain working of a three phase induction motor.
Q.5 Draw and explain characteristics of SCR.
Q.6 Write full form of MCCB. Explain its working.
Q.7 Explain speed control of induction motor.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 What are the three phase balanced circuits? Derive voltage and current relations in star and delta connections.
Q.2 What type of losses are there in transformer? Explain. Write about regulation and efficiency of transformer.
Q.3 Explain construction, working, torque speed characteristics and speed control of separately excited DC motor.
Q.4 Draw and explain basic circuits of single phase rectifier with R load. Explain DC-DC converter.
Q.5 Explain types of earthing. What do you mean by power measurement? Explain elementary calculations for energy consumption.