Narasaraopeta Engineering College (Autonomous)

NEC Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1201

I B.Tech II Semester Supple. Examinations, September-2023
INTERACTIVE ENGLISH
(Common to CE, EEE, ME, ECE & CSE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) List the barriers to communication.
   (b) How does Satya Nadella motivate young people?
   (c) What are the features of a good paragraph?
   (d) Write two sentences about Sachin's Test Debut.
   (e) What motivated Sam Pitroda to go to the United States?
   (f) Write two leadership qualities you find in Indra Nooyi.

                                                [2+2+2+2+2+2]

PART-B

                                                4 X 12 = 48

2. (a) Give an account of the early influences on Abdul Kalam.
   (b) Detail the process of communication with examples.   **[7+5=12]**

3. (a) What qualities do you learn from Satya Nadella? Explain.
   (b) Brief the importance of interpersonal communication.   **[7+5=12]**

4. (a) What business ideologies did transform Azim Premji a successful man in industry? Illustrate
   (b) Write an essay on the advantages and disadvantages of technology.   **[7+5=12]**

5. (a) Trace out the success formula from the life of Sachin Tendulkar and justify how he can be an icon of youth in sports.
   (b) Convert the following into Indirect speech.
      i. He said to me, "You alone can save her".
      ii. Sasank said, "Where can I get an application form?"
      iii. "Would you like to attend the summer course?" said the Principal.
   (c) Convert the following into passive voice.
      i. Insert the CD into CD Drive.
      ii. The people elected him Mayor.   **[7+3+2=12]**

6. (a) Discuss Sam Pitroda's contribution as a Chairman of the National Knowledge Commission (NKC).
   (b) Correct the following sentences where ever necessary.
      i. Keerthana has been watching television since one hour.
      ii. The two friends must help one another.
      iii. Let us discuss about the dispute.
      iv. He was called as 'the big brother' by his friends.
   v. She helps the people who are in need. Does she?   **[7+5=12]**

7. (a) Indra Nooyi, a powerful woman entrepreneur from India – Justify.

   (b) Write one word substitutes for the following words.

     i. One who studies the formation of the earth.

     ii. A person who has a lot of experience in a particular area or activity.

     iii. Notice of death as in a newspaper.

     iv. Photographic print for an engineering plan

     v. The art of cultivating and managing gardens.   **[7+5=12]**

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Subject Code: R16CC1202

I B.Tech II Semester Supple Examinations, September-2023
INTEGRAL TRANSFORMS AND VECTOR CALCULUS
(Common to CE, EEE, ME, ECE & CSE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) State first shifting theorem on Laplace transforms.

(b) Find $Z(a^n)$.

(c) Why the function $f(x) = \tan x$ has no Fourier series expansion in $(0, 2\pi)$.

(d) Define Fourier Cosine transform.

(e) Find normal vector to the surface $x^2 + y^2 + 2z^2 = 26$ at $(2, 1, 3)$.

(f) State Gauss's divergence theorem.

$[2+2+2+2+2+2]$

PART-B   4 X 12 = 48

2. (a) Using Laplace transforms, solve $\dfrac{d^2y}{dt^2} + 4\dfrac{dy}{dt} + 3y = 0$, given that $y(0) = 0$, $y'(0) = 1$.

(b) Find $L^{-1}\left[\dfrac{s-2}{(s-2)^2 + 8}\right]$.

3. (a) Using convolution theorem to evaluate $Z^{-1}\left\{\dfrac{z^2}{(z-a)(z-b)}\right\}$.

(b) Find $Z\left[e^t \sin 2t\right]$.

4. (a) Using Fourier integral show that $e^{-ax} - e^{-bx} = \dfrac{2(b^2 - a^2)}{\pi}\int_0^\infty \dfrac{\lambda \sin \lambda x}{(\lambda^2 + a^2)(\lambda^2 + b^2)}d\lambda$.

(b) Find the Fourier transform of $f(x) = \begin{cases} x, & |x| \le a \\ 0, & |x| > a \end{cases}$.

5. (a) Express $f(x) = x$ as a half range sine series in $0 < x < \pi$.

(b) Expand $f(x) = x^2$ as a Fourier series in the interval $0 < x < 2\pi$.

6. (a) Find directional derivative of $f = xy^2 + yz^3$ at $(2, -1, 1)$ in the direction of $\hat{i} + 2\hat{j} + 2\hat{k}$.
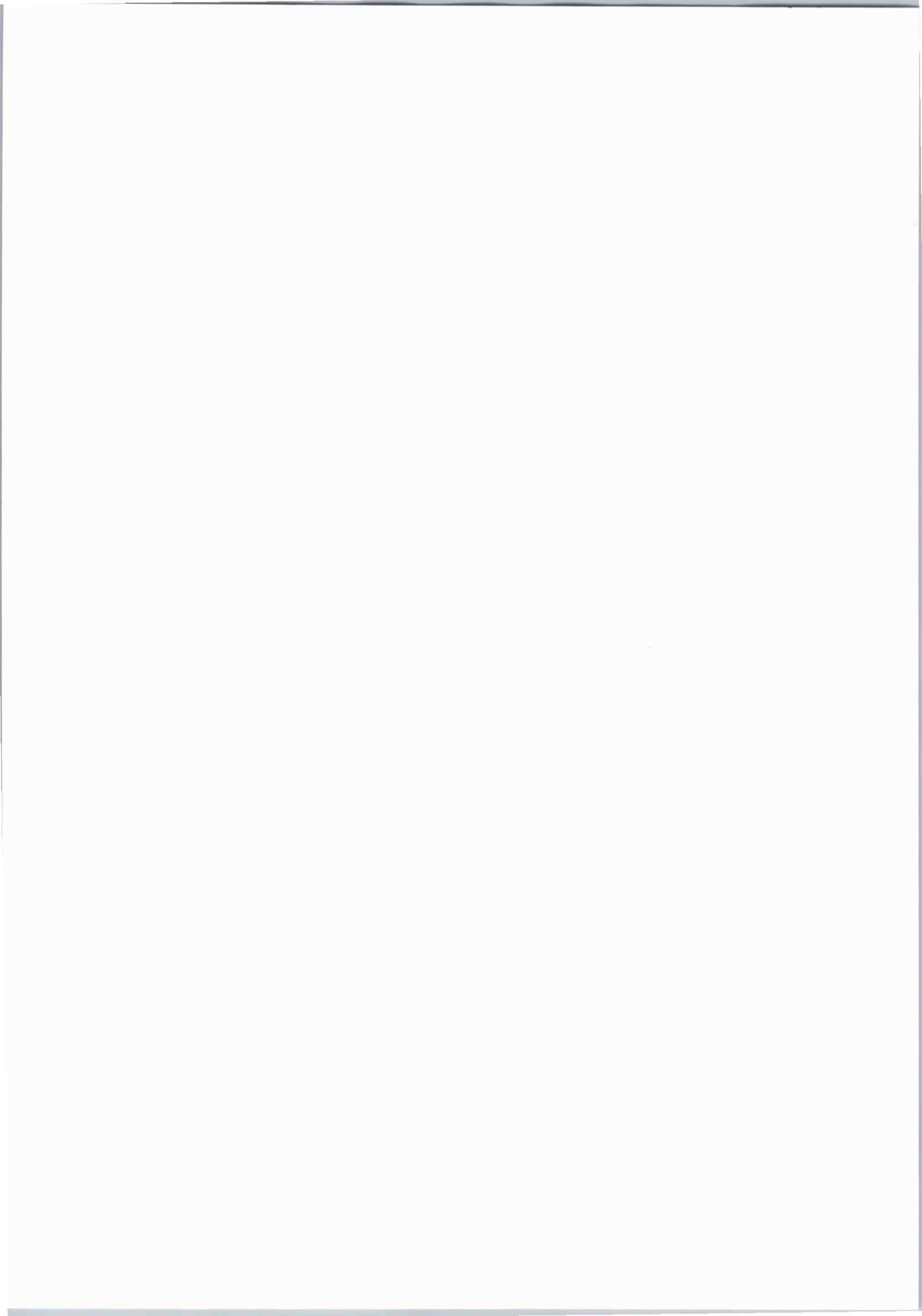
(b) Show that $\nabla^2 r^n = n(n+1)r^{n-2}$.

7. (a) Evaluate $\oint_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the boundary of the region defined by

$y = \sqrt{x}$ and $y = x^2$ by using Green's theorem in a plane.

(b) If $\bar{F} = 2xz\bar{i} - x\bar{j} + y^2\bar{k}$ Evaluate $\iiint_V \bar{F}\,dv$ where V is the region bounded by

$x = 0, x = 2 ; y = 0, y = x ; z = x^2 , z = 4$.

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Subject Code: R16CC1203

I B.Tech II Semester Supple Examinations, September-2023
ENGINEERING PHYSICS
(Common to CE, EEE & ME)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
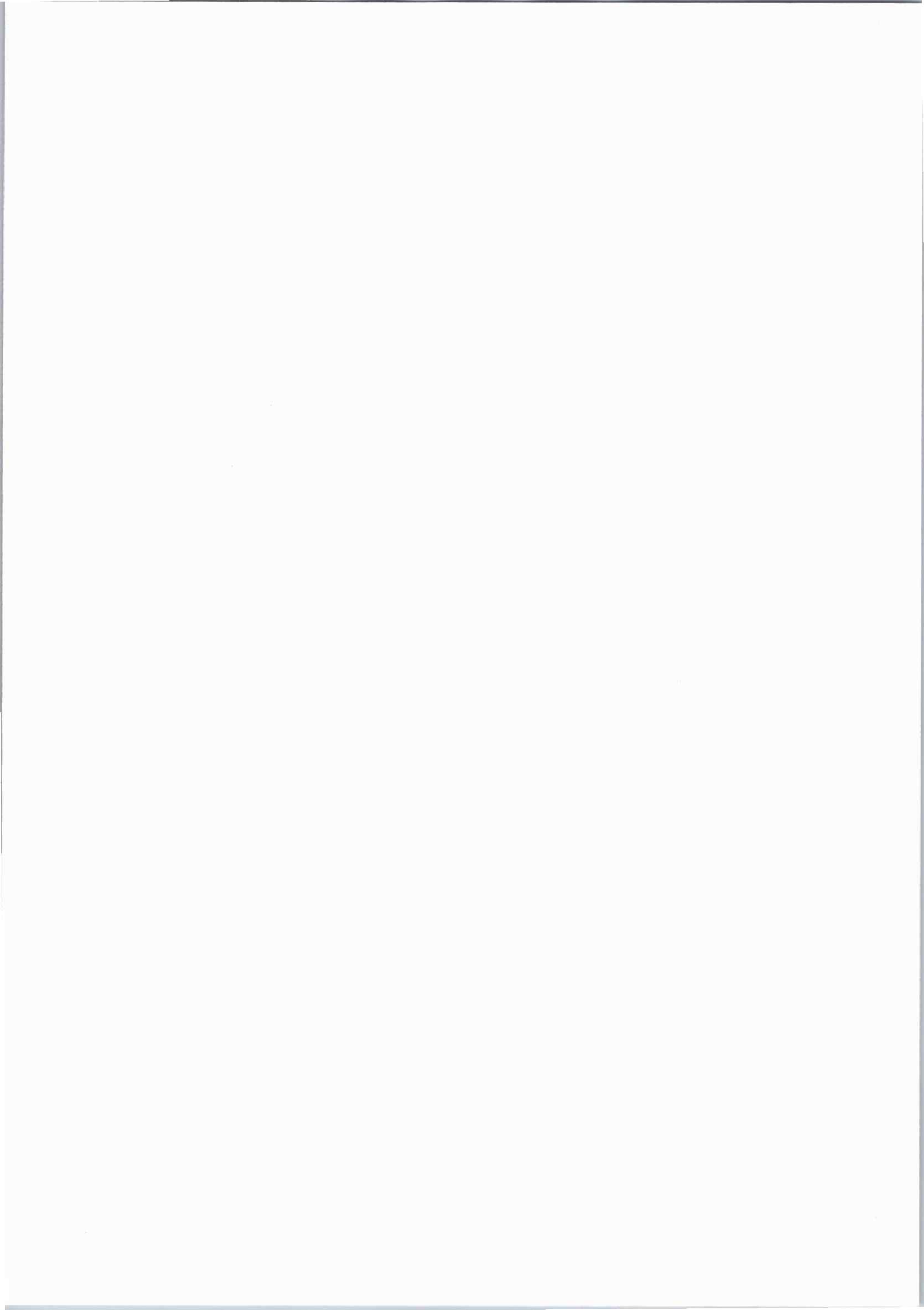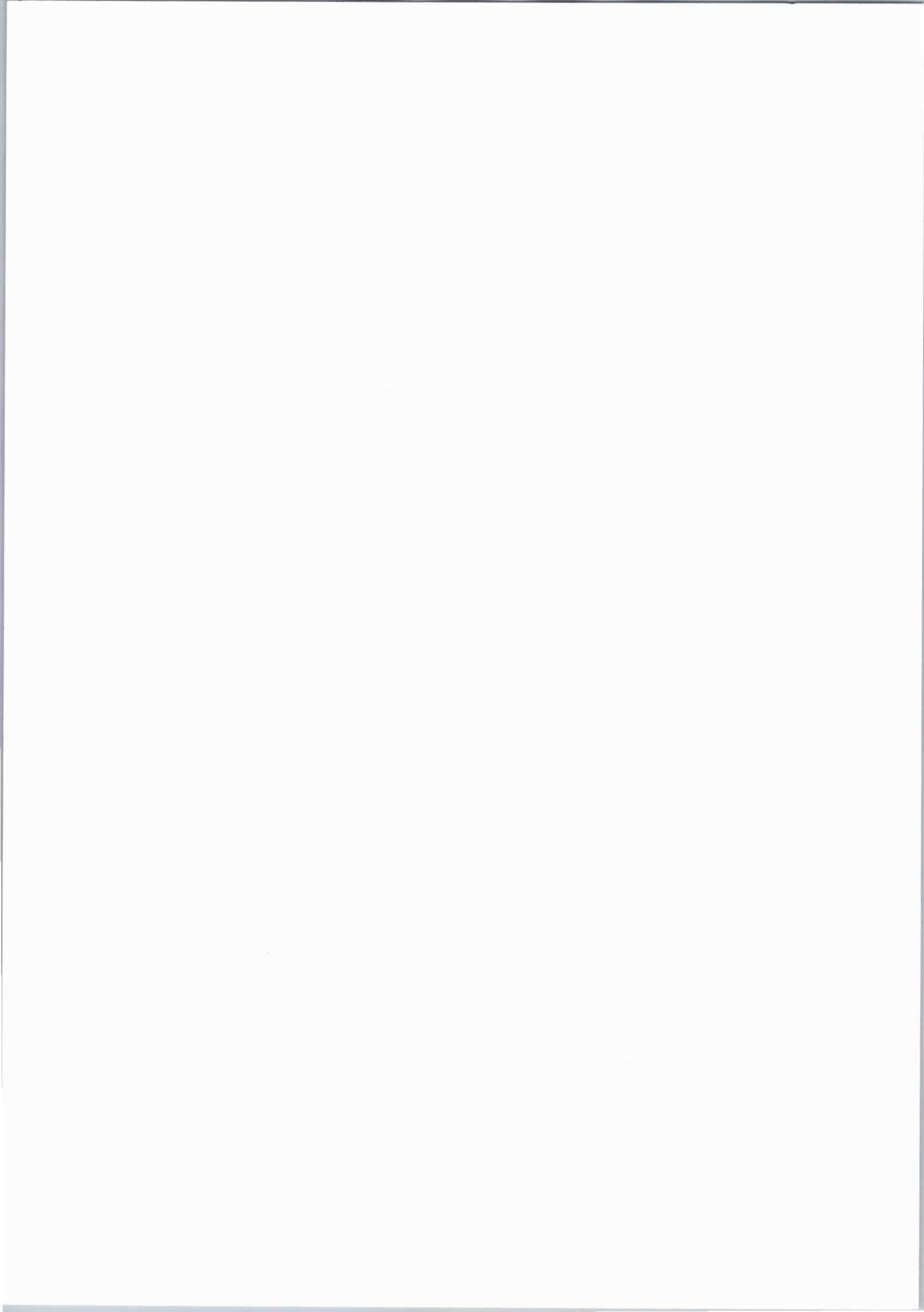All questions carry equal marks of 12.

PART-A

1. (a) Describe the conditions for sustained interference pattern.

   (b) Using the ray optics, explain the principle of working of light propagation in an optical fibre.

   (c) Define primitive and non-primitive unit cell. Mention the examples.

   (d) Discuss inverse piezoelectric effect.

   (e) Discuss any four properties of matter waves.

   (f) With the help of band energy diagram, draw the positions of Fermi energy, donor and acceptor energy levels and conduction and valence band energy levels for intrinsic, n-type and p-type semiconductors.

                                         [2+2+2+2+2+2]

PART-B

                                4 X 12 = 48

2. (a) Determine the radius of curvature of the given plano-convex lens using Newton's ring experiment.   **[8M]**

   (b) Differentiate Fraunhofer and Fresnel diffraction and discuss its limitations.   **[4M]**

3. (a) What are different processes occurred when light interacts with matter? Derive the Einstein coefficients of the laser systems. Discuss the significance of these coefficients towards production of monochromatic laser beam.   **[8M]**

   (b) Discuss any four important characteristics of laser radiation.   **[4M]**

4. (a) What is atomic packing factor? Prove that the FCC crystal systems are well densely packed than BCC and SC crystal systems.   **[8M]**

   (b) Discuss the Bragg's condition of diffraction and mention its limitations.   **[4M]**

5. (a) What is piezoelectric effect? Explain the geometry of quartz crystal. Discuss the construction and working of piezoelectric oscillator for the production of ultrasonic waves. Mention its advantages and limitations.   **[8M]**

   (b) Explain the Sabine's formula of reverberation time.   **[4M]**

6. (a) Assuming Schrodinger wave equation, derive the probability density function and energy values of different excitation levels of the particle enclosed in a potential well of infinite height. Prove that the energy levels of the particle are quantized.   **[8M]**

   (b) Discuss the success and failures of quantum free electron theory.   **[4M]**

7. (a) state and explain Hall effect. Derive the relation between Hall coefficient and Hall voltage. Discuss the advantages and limitations of this method.   **[8M]**

   (b) Classify the solids based on band theory of solids.   **[4M]**

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Narasaraopeta Engineering College (Autonomous)

NEC Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1204

I B.Tech II Semester Supple Examinations, September-2023
ENGINEERING CHEMISTRY
(Common to ECE & CSE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Explain caustic embrittlement in Boiler.
   (b) What are thermosetting plastics? Give examples.
   (c) Write two applications of Ibuprofen.
   (d) Mention the factors affecting corrosion.
   (e) What are synthetic petrols?
   (f) Define Molar extinction coefficient and write its unit.

                     [2+2+2+2+2+2]

PART-B

                     4 X 12 = 48

2. (a) Explain the principle involved in Ion exchange method   [6M]
   (b) Explain Zeolite process for softening of hard water with a suitable diagram.   [6M]

3. (a) Write short notes on styrene rubber (GRS).   [6M]
   (b) What are biodegradable polymers? Give suitable examples.   [6M]

4. (a) State the differences between thermotropic and lyotropic liquid crystals.   [6M]
   (b) Write a short note on photo voltaic cells.   [6M]

5. (a) Explain the construction and working principle of Lead-acid storage cell with chemical reactions (for charging and discharging) involved in it.   [6M]
   (b) Explain sacrificial anode protection?   [6M]

6. (a) Differentiate octane number and cetane number of a fuel.   [6M]
   (b) Write a short note on CNG.   [6M]

7. (a) State Lambert-Beer's Law.   [2M]
   (b) Calculate the energy produced per mole of photons having wavelength of 2500 Å.   [3M]
   (c) Write two examples of photochemical reaction.   [2M]
   (d) Write a short note on applications of photochemistry.   [5M]

Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1206

I B.Tech II Semester Supple Examinations, September-2023
ENGINEERING MECHANICS
(Common to CE & ME)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Distinguish between moment and couple
   (b) Angle of Repose
   (c) Differentiate between centroid and centre of gravity
   (d) Define and state the significance of Moment of Inertia
   (e) perpendicular axis theorem
   (f) Differentiate Kinematics and Kinetics

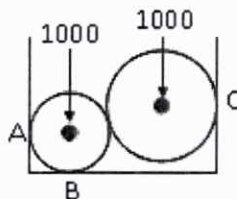   [2+2+2+2+2+2]

PART-B

                                                    4 X 12 = 48

2. a) If five forces act on a particle and the algebraic sum of horizontal components of all these forces is −324.904 kN. Calculate 'P' and the resultant of all the forces.
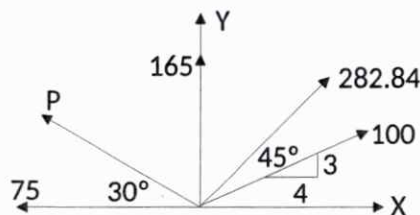

b) Two spheres each of wt. 1000 N and of radius 25 cm rest in on a horizontal channel of width 90 cm. Find the reactions at A, B and C.


3. A 15° wedge (A) has to be driven for tightening a body (B) loaded with 1000 N weight. Angle of friction for all surfaces is 14°. Find force 'P' applied.
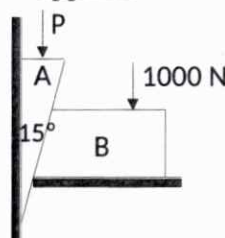
4. (a) Determine the coordinates of the centroid C of a right-angle triangle. [8M]
   (b) State Pappu's theorem – I and theorem – II. [4M]

5. Find the moment of inertia of the plane area about its centroidal axis.
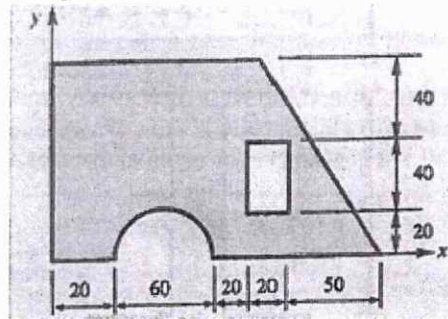
6. Determine the mass moment of inertia of a solid cone of height H about its vertical axis.

7. a) The acceleration of a particle is defined by the relation $a = \alpha t-4$. Knowing that $v = 4m/s$ when $t = 2s$ and $v = -1$ m/s when $t = 1s$, determine the constant α. Write the equations of motion when $x = 0$ at $t = 3s$.
b) A small block starts from rest at point A and slides down the inclined plane AB as shown in fig. What distance 's' along the horizontal plane BC will it travel before coming to rest? The coefficient of kinetic friction between the block and either plane is 0.3.

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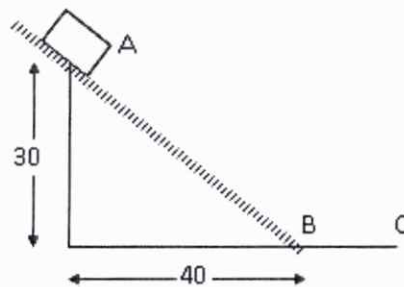
Subject Code: R16CC1207

I B.Tech II Semester Supple Examinations, September-2023
ENGINEERING DRAWING
(Common to CE & ME)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What are the different methods of dimensioning?
    (b) What is the difference in the shape of trace of a line & trace of a plane?
    (c) What do you mean by generator of cone?
    (d) Define plane.
    (e) What are right solids?
   (f) What are isometric and non-isometric lines?

                                                    [2+2+2+2+2+2]

PART-B

                                                    4 X 12 = 48

2. (a) Construct a diagonal scale of RF 1/24, capable of reading 4 yards and showing yards, feet and inches. Show on it the length 3 yards, 2 feet and 10 inches.
    (b) construct a vernier scale to read metres, decimetres and centimetres and long enough to measure upto 4m. The RF of the scale is 1/20. Mark on it a distance of 2.28 m.

3. (a) The plan of the point P lies 40 mm above the reference line xy and its elevation 50 mm above the reference line xy. Mention the quadrant in which the point is situated. Draw its projections and find the shortest distance of the point from the intersection of the HP and VP.
    (b) A line PQ of 70 mm length is parallel to and 15 mm in front of the VP. Its ends P and Q are, respectively, 20 mm and 70 mm above HP. Draw its projections and find its inclination with the HP.

4. End projectors of a straight line AB are 60 mm apart. Ends A and B are, respectively, 25 mm and 50 mm above the HP; and 35 mm and 50 mm in front of the VP. A point C, 55 mm from A and 65 mm from B, lies in the HP. Draw the projections of straight lines AB, BC, and CA and determine the distance of point C from VP.

5. A hexagonal plate of 25 mm sides is having one of its corners on the ground with its surface inclined at 45 degrees to the HP and diagonal through the corner on ground is parallel to the VP. Draw its projections.

6. A square prism, having a base with a 30mm side and 60mm height is resting on the base in HP such that one of the rectangular faces is parallel to the VP. It is cut by a plane perpendicular to VP and 60 degrees inclined to HP and bisecting the axis of the solid. Draw development of lateral surface of the bottom part of the solid.

7. Draw the three orthographic views for the following fig.

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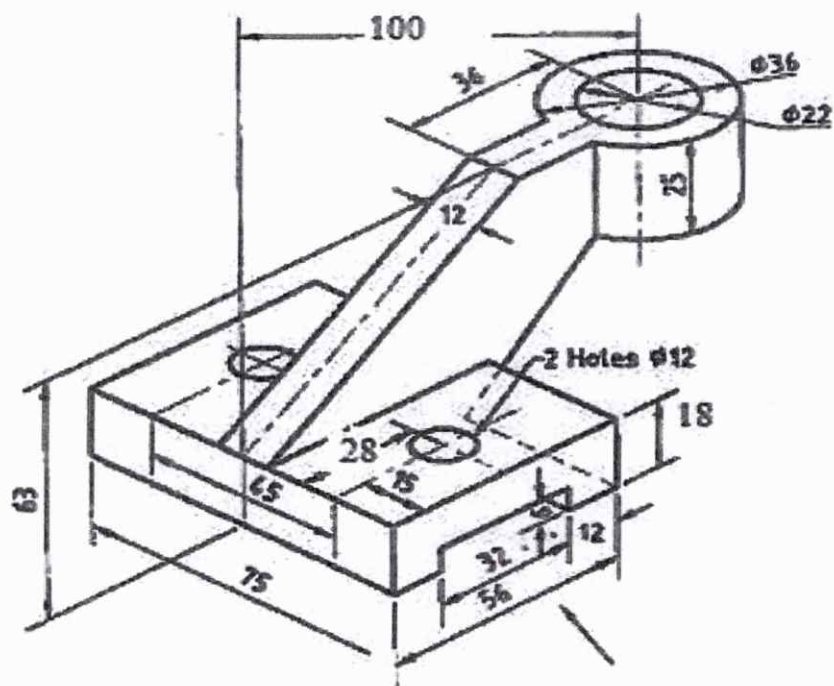
Subject Code: R16EE1208
I B.Tech II Semester Supple Examinations, September-2023
ENGINEERING GRAPHICS
(EEE)
Time: 3 hours   Max Marks: 60
Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is least count in case of vernier?
   (b) What is a Projection?
   (c) Describe about first-Angle projection method?
   (d) Define top view and front view.
   (e) Define Cylinder and sphere.
   (f) State the ratio of isometric length of surfaces.

                                                                 [2+2+2+2+2+2]

PART-B

                                                                 4 X 12 = 48

2. Construct a hyperbola when the distance between the focus and directrix is 40mm.
   The Eccentricity is 4/3. Draw a tangent and normal at any point on the hyperbola.

3. a) i) point A is 30mm above HP and 45mm in front of VP. Draw its front view and top view.
        ii) point B is 45mm above HP and 60mm behind VP. Draw its projections.
        iii) point C is 35mm below HP and 25mm behind VP. Draw its projections.
   b) A line PQ 40mm long is parallel to VP and inclined at an angle of 30 degrees to HP. The
      lower end P is 15mm above HP and 20mm in front of VP. Draw the projections of the line.

4. The distance between the projectors of two points A and B is 70mm. A is 10mm above HP and
   15mm in front of VP. B is 50mm above HP and 40mm in front of VP. Find the shortest distance
   between A and B.

5. Semi-Circular lamina of 64 mm diameter has its straight edge in VP and inclined at angle of 45
   degrees to HP. The surface of the laminar makes an angle of 30 degree with VP. Draw the
   projections.

6. a) A square pyramid side of base 30mm and axis 50mm long rests with its base on HP such that
      one of its edges of the base is parallel to and 10mm in front of VP. Draw its projections.
   b) Draw the Projections of a right circular cone of base 40mm diameter and height 60mm when
      resting with its base on HP.

7. Draw (i) Front View (ii) Top View (iii) Side View of the bellow mentioned Diagram.

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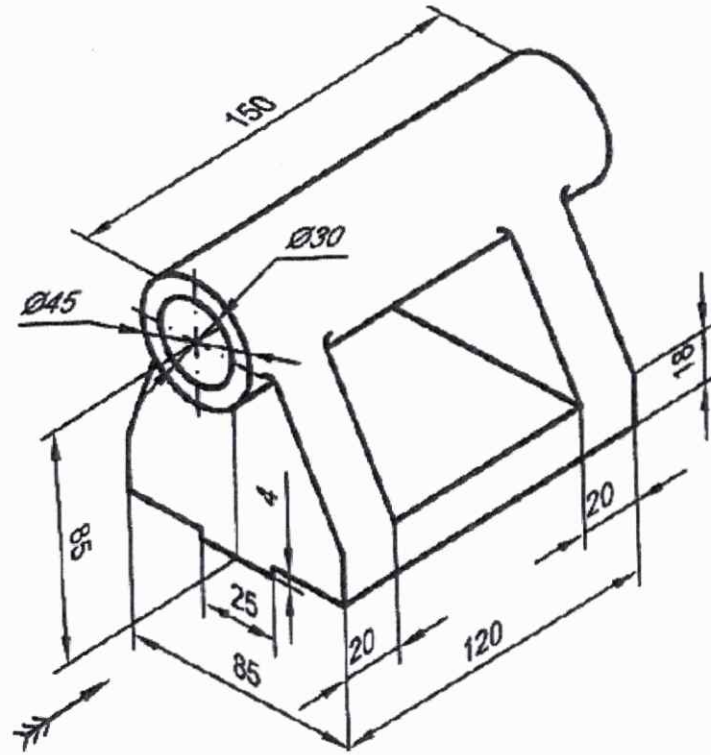
Subject Code: R16EC1210
I B.Tech II Semester Supple Examinations, September-2023
PROGRAMMING WITH C
(ECE)
Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a)What are the rules for naming variables in C programming?

    (b)Define an array. Give syntax for array creation.

    (c)Distinguish between user defined function and built in function.

    (d) What is the use of command line arguments?

    (e)Define union. Give syntax for union creation.

    (f)Define random file in file handling.

                                                    [2+2+2+2+2+2]

PART-B

                                                    4 X 12 = 48

2. (a) Explain about logical and bitwise operators.   [4]

   (b) Discuss various primitive data types in C programming.   [4]

3. (a) Explain the usage of continue in for loops with an example program. [4]

   (b) Discuss any three string functions with syntax and example.   [4]

4. (a) Explain the process of passing arrays as function arguments with an example
       program.   [4]
   (b) Write a C program to generate Fibonacci series using recursion. [4]

5.(a) Write a program for illustrating the dynamic memory allocation. [4]

   (b) Discuss how a pointer to pointer can be created with example.   [4]

6. (a) What is enumeration? Discuss with example.   [4]

   (b) Discuss the process of passing pointer to structure with a C program. [4]

7. (a) What is a binary file? How it can be created and state its uses? [4]

   (b) Discuss various file operations with their syntax.   [4]

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Subject Code: R16EC1211

I B.Tech II Semester Supple Examinations, September-2023
NETWORK ANALYSIS
(ECE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define electric potential, electric current and electric energy

   (b) Define average value, RMS value and form factor for an alternating quantity.

   (c) Explain why current leads the voltage by 90^0 in case of ideal capacitor and current lags the voltage by 90^0 in case of ideal inductor.

   (d) State maximum power transfer theorem

   (e) Write condition of symmetry and reciprocity for transmission, inverse transmission and inverse h-parameters.

   (f) What is time constant? Give the formula of time constant for R-L and R-C circuits.

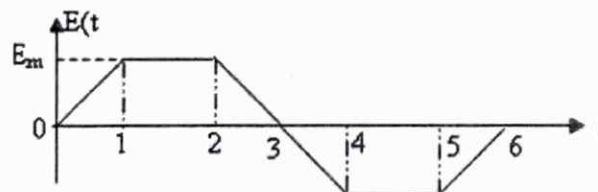   **[2+2+2+2+2+2]**

PART-B

                                                                                    4 X 12 = 48

2. (a) Explain about source transformation.

   (b) For the circuit shown in figure, find all the branch currents using nodal analysis. Also show that total power delivered is equal to total power dissipated.
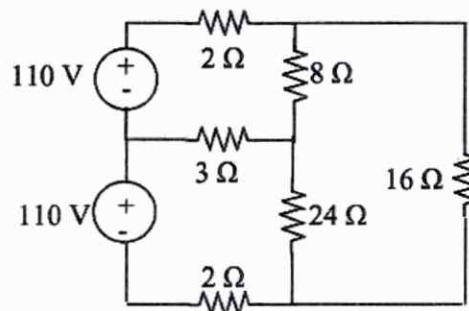
3. (a) Define average value, RMS value, form factor and peak factor and calculate the same for the following periodic waveform shown in figure.


   (b) Define: (i) Loop (ii) Planar graph (iii) Oriented graph (iv) Loop (v) Path (vi) Connected graph

4. (a) A current of 5 A flows through a non-inductive resistance in series with a chocking coil when supplied at 250 V, 50 Hz. If the voltage across the non-inductive resistance is 125V and that across the coil 200V, calculate Impedance, Reactance and Resistance of the coil, and power absorbed by the coil. Also draw the phasor diagram.

   (b) For a series resonant circuit with constant voltage and variable frequency, obtain the frequency at which voltage across the inductor is maximum. Calculate this maximum voltage when R=50 ohms, L=0.05H, C=20 micro farad and V=100 volts

5. (a) Verify the Tellegen's theorem for the circuit shown in Figure
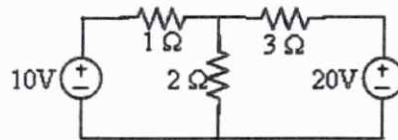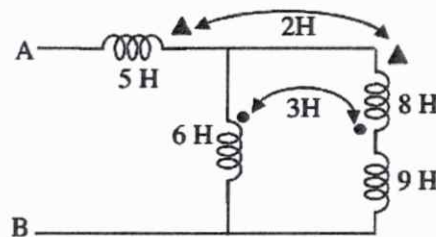

   (b) Find current in 9 Ω resistor in the circuit shown in Figure 5 when 5 Ω resistor is changed to 6 Ω using compensation theorem.
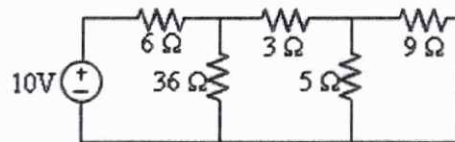
6. (a) Derive Z – parameters as a function of h-parameters
   (b) Calculate the effective inductance across terminals A-B for the circuit shown in Figure.

7. (a) A sinusoidal voltage V = 50 sin 400t is applied suddenly to a series RC circuit with R = 25Ω and C = 50µF. Assuming zero initial charge on capacitor, find the expression for current in the circuit.
   (b) A 200 Ω resistor is in series with an inductor L. The initial value of the inductor current is 5 mA and its value after 5 ms is 3mA. Find the time constant and the inductance.

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Subject Code: R16CS1213

I B.Tech II Semester Supple Examinations, September-2023
MATHEMATICAL METHODS
(CSE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Find the value of x such that $\begin{bmatrix} 1 & 1 & x \end{bmatrix} \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = O$

(b) Determine the eigen values of the matrix $\begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$

(c) Change the integral $\int_{0}^{\infty} \int_{0}^{\infty} e^{-(x^2+y^2)} \, dx \, dy$ into polar coordinates.

(d) Find approximate value of $\sqrt{5}$ by Newton's iteration method.

(e) Prove that $\nabla\Delta = \Delta - \nabla$

(f) Write formulae to find definite integral value of a function using (i) Trapezoidal rule; and (ii) Simpson's 3/8th rule.

$$[2+2+2+2+2+2]$$

PART-B

$$4 \times 12 = 48$$

2. (a) Reduce the matrix $\begin{bmatrix} 0 & 1 & 2 & 1 \\ 1 & 2 & 3 & 1 \\ 3 & 1 & 1 & 3 \end{bmatrix}$ to normal form and find the rank.

(b) Find LU decomposition of $\begin{bmatrix} -3 & 2 & -1 \\ 6 & -6 & 7 \\ 3 & -4 & 4 \end{bmatrix}$.

3. (a) Verify Cayley-Hamilton theorem for $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$, and hence find A^8.

(b) Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$ to the canonical form and specify the matrix of transformation.

4. (a) Find the volume bounded by the cylinder $x^2 + y^2 = 4$ and the plane $y + z = 4$ and $z = 0$.

(b) Change the order of integration and hence evaluate $\int_{0}^{1} \int_{0}^{\sqrt{1-x^2}} y^2 \, dy \, dx$.

5. (a) Find a root of the equation $x^3 - 2x - 5 = 0$ using bisection method.

   (b) Solve $\sin x = 1 - x$, by Newton-Raphson method.

6. (a) Find the missing value from the table:

x:	1	2	4	5	6
y:	14	15	5	...	9

   (b) Using Lagrange's interpolation formula fit a polynomial to the following data

x:	0	1	3	4
y:	-12	0	6	12

7. (a) Given $\dfrac{dy}{dx} = -xy^2$, $y(0) = 2$, using Euler's modified method find $y(0.2)$ in two steps of 0.1 each.

   (b) Find $y(0.8)$ correct to four decimal places by using Runge-Kutta method of 4th order if $\dfrac{dy}{dx} = y - x^2$, $y(0.6) = 1.7379$.

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Subject Code: R16CS1214

I B.Tech II Semester Supple Examinations, September-2023
C PROGRAMMING
(CSE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define type casting
   (b) What is the need of goto statement
   (c) Define function?
   (d) What is command line argument
   (e) What is the use of bit fields in C?
   (f) List various modes of opening a file.

                                                                  [2+2+2+2+2+2]

PART-B

                                                                  4 X 12 = 48

2. (a) Explain the program development steps in detail
   (b) Write a C program in C to find the area and perimeter of a rectangle

3. (a) Explain if, if else, and cascaded if-else with examples
   (b) Write a C program to find sum of Natural numbers from 1 to N using for loop

4. Give the scope and life time of the following (i)External variable (ii) Static variable (iii) Automatic variable (iv) Register variable

5. (a) What is meant by Dynamic memory allocation in C language? Discuss the advantages and disadvantages of dynamic memory allocation
   (b) Discuss various valid arithmetic operations that can be performed on pointers in C.

6. How do you define a structure, structure variables, access their elements and perform operations on them? Explain with example program

7. (a) Explain about the fopen, fclose, feof, fprintf, fscanf, fseek and rewind functions
   (b) Write a program to pint file contents on the screen.

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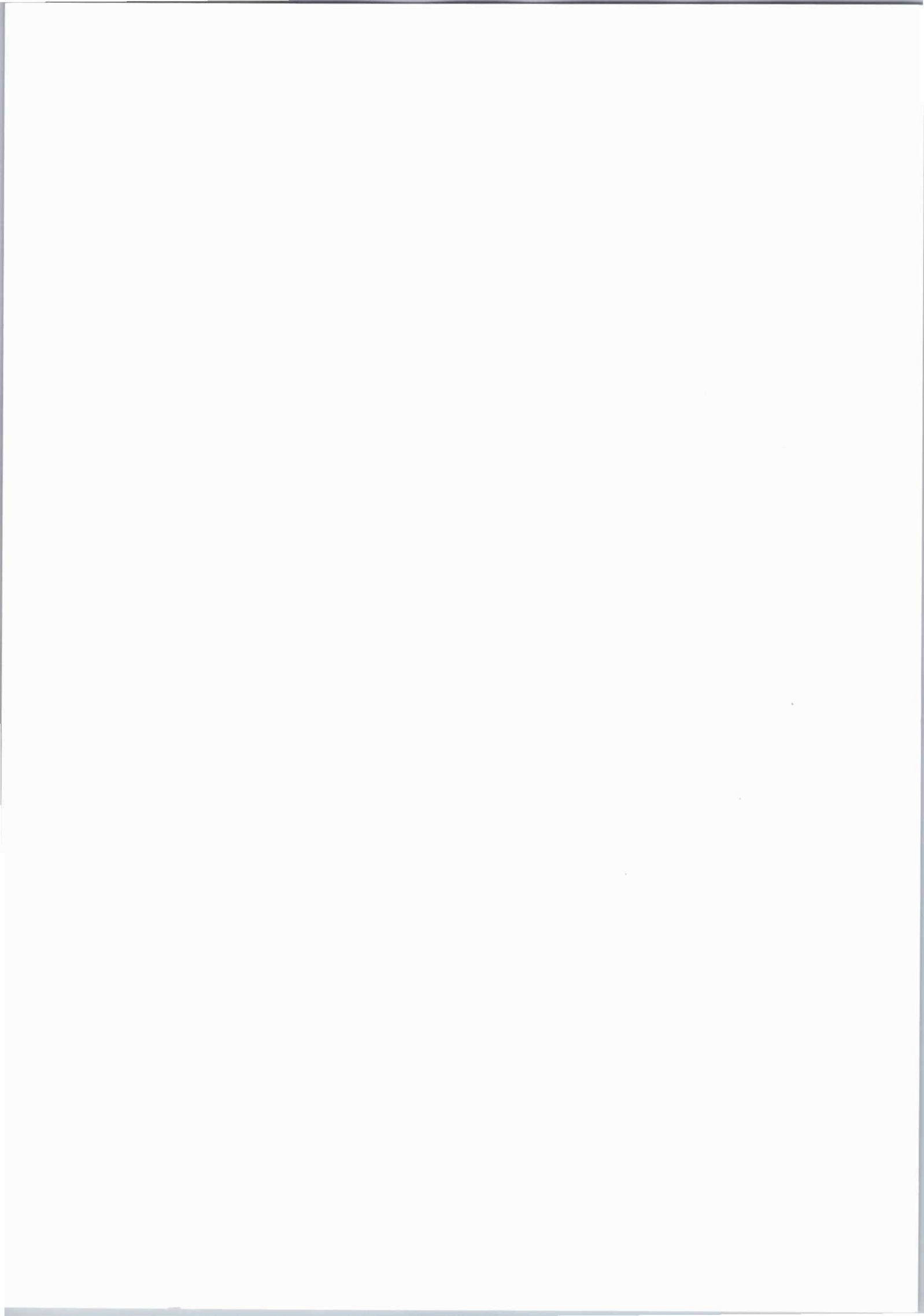
Subject Code: R16CS1215

I B.Tech II Semester Supple Examinations, September-2023
ELECTRONIC DEVICES AND LOGIC DESIGN
(CSE)

Time: 3 hours 　　　　　　　　　　　　　　　　　　　　　　　　**Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Explain how the Zener diode is used as a regulator.
   (b) Write down the relation between transistors α, β, and γ.
   (c) State Barkhausen criterion.
   (d) Express the Boolean function ($A+\bar{B}C$) in canonical SOP form.
   (e) Draw a full subtractor circuit designed with two half subtractors.
   (f) Differentiate synchronous and asynchronous counters.

   　　　　　　　　　　　　　　　　　　　　　　　　[2+2+2+2+2+2]

PART-B

　　　　　　　　　　　　　　　　　　　　　　　　4 X 12 = 48

2. (a) An AC supply of 230V is applied to a half-wave rectifier circuit through a transformer with a turns ratio of 10:1. Find (a) DC output voltage and (b) PIV. Assume the diode to an ideal one

   (b) With the circuit and necessary waveforms explain the operation of the bridge rectifier with filter.

3. (a) Determine I_C, I_E, and α for a transistor circuit having $I_B=10\mu A$ and $\beta=100$
   (b) Draw the circuit diagram of an NPN junction transistor CE configuration and describe the static input and output characteristics. Also, Define active, saturation and cut-off regions and saturation resistance of a CE transistor.

4. (a) What is Biasing? Explain the need for it. List out different types of biasing methods.
   (b) Explain in detail about Crystal oscillator.

5. Construct the truth table for a logic circuit whose output is '1' when an even number is given as input. For both 3-bit and 4-bit combinations,
   (a) Represent the output expression in SOP and POS forms. 　　　　　　　　　**[4M]**
   (b) Reduce the output Boolean expression. 　　　　　　　　　　　　　　　　**[4M]**
   (c) Implement the expression in AOI form. 　　　　　　　　　　　　　　　　**[4M]**

6. (a) Design a 4:2 priority encoder, with a priority function A0 < A1 < A2 < A3.

   (b) Realize a full adder using 4:1 Multiplexers.

7. (a) Analyse a Bidirectional shift register.

   (b) Design an asynchronous mod-10 counter.

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