

Seat No. **Summer Examination March - 2023**

Subject Name: B.Tech. CBCS_71819 _ Applied Mechanics_07.08.2023_10.30 AM To 01.00 PM

Subject Code: 71819

Day and Date: - Monday, 07-08-2023

Total Marks: 70

Time: - 10:30 am to 01:00 pm

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

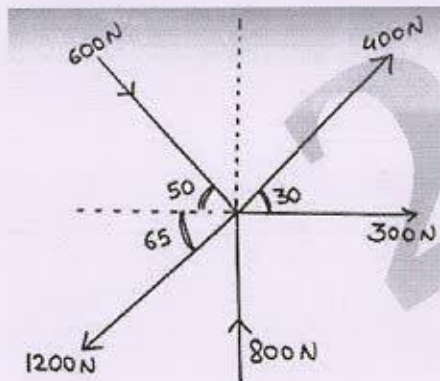
3. Attempt any three questions from each section 4. Use of non-programmable calculator is allowed.

Q.1.

SECTION-I

[11]

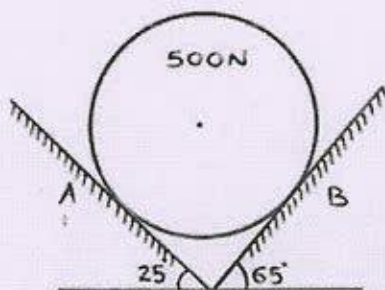
- a) State Varignon's Theorem? (3 Marks)
- b) Find the resultant of the given force system as shown in the figure below. Also find its direction & position? (Note:-All the angles i.e. 50, 30, 65 are in Degree) (8 Marks)



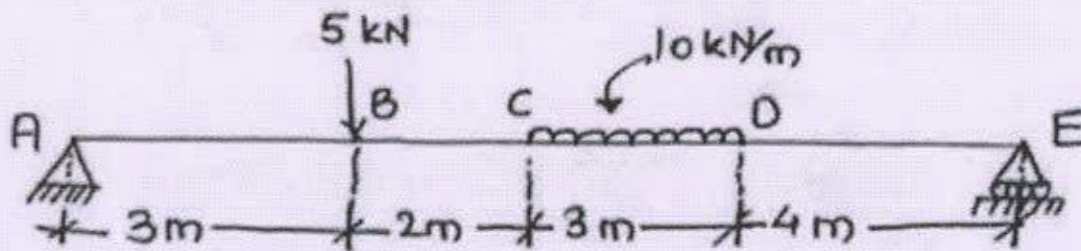
Q.2.

- a) State Lami's Theorem? (3 Marks)
- b) Find the reaction at point of contact A & B for the sphere of weight 500N ? (9 Marks)

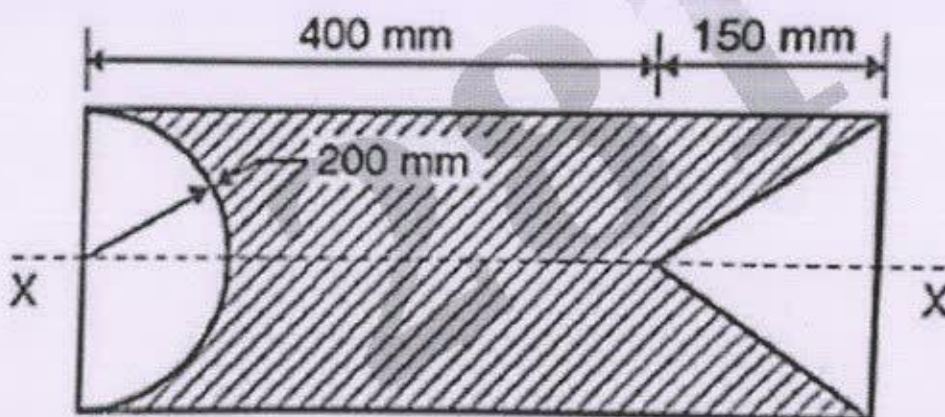
[12]



- Q.3. a) State the principle of virtual work? (3 Marks) [11]
 b) Determine the support reaction for the beam loaded as shown in the figure, support A is hinge support & support E is roller support? (8 Marks)



- Q.4. a) State perpendicular axis theorem? (3 Marks) [12]
 b) Calculate M.I. for the shaded part of the lamina as shown in the figure about the centroidal axis? (9 Marks)



- Q.5. SECTION-II [11]
 a) State and explain De Alembert's principle? (3 Marks)
 b) A man weighing 750 N stands on the floor of a lift, Determine the pressure exerted on the floor when, 08
 1. The lift moves upward with an acceleration of 2.5 m/s^2
 2. The lift moves downward with an acceleration of 2.5 m/s^2
 (8 Marks)
- Q.6. a) State Impulse Momentum Principle? (3 Marks) [12]
 b) A car moving on a straight level road skidded for a total distance of 60 meters after the brakes were applied. Determine the speed of the car just before the brakes were applied. If the coefficient of friction between car tyres and the road is 0.4? (9 Marks)

- Q.7. a) State Newton's law of circular motion? (3 Marks) [11]
b) A small car weighing 10,000 N runs along a level unbanked road of mean radius 300m, the inner and outer wheels are 1m apart. The centre of gravity of the car is 0.60 m above the road level. The coefficient of friction between the road surface and the tyres is 0.30. Determine the speed at which the car will
1. Skid and
2. Overturn.
Find also the safe speed for the car on the curve adopting a factor of safety of 1.50? (8 Marks)
- Q.8. a) State and explain Law of conservation of Momentum? (3 Marks) [12]
b) A body of mass 3 Kg moving with a velocity of 3m/s collides directly on another body of mass 6 Kg moving with a velocity of 2m/s in opposite direction. If the coefficient of restitution is 0.6; find the velocity of ball after impact? (9 Marks)

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Seat No.

QP Code: 3316QP

Total No. of Pages: 3

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71819_Applied Mechanics_27.03.2023_10.30 AM To 01.00 PM

Subject Code: 71819

Day and Date: Monday, 27-03-2023

Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

3. Attempt any three questions from each section 4. Use of non-programmable calculator is allowed.

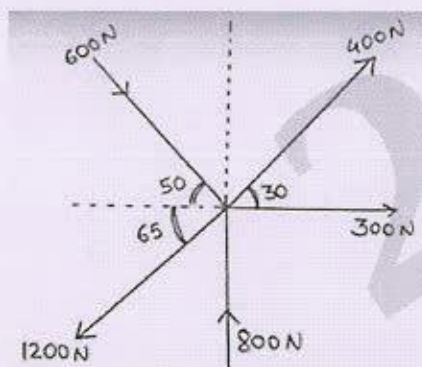
Q.1.

SECTION -I

[11]

- a) Define & explain Rigid body? (3Marks)
- b) Find the resultant of the given force system as shown in the figure below. Also find its direction & position? (All the angles i.e. 50, 30, 65 are in Degree) (8Marks)

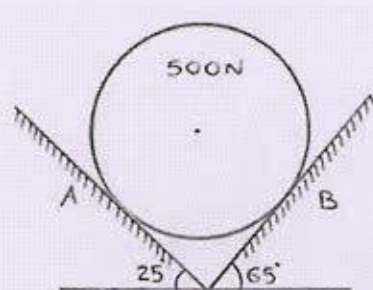
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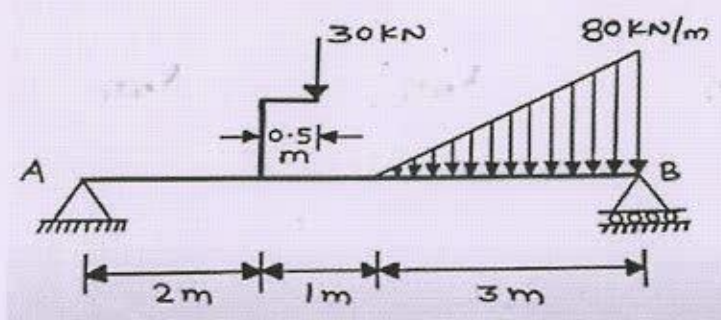
Q.2.

- a) State Lami's Theorem? (3 Marks)
- b) Find the reaction at point of contact A & B for the sphere of weight 500N shown below? (9 Marks)

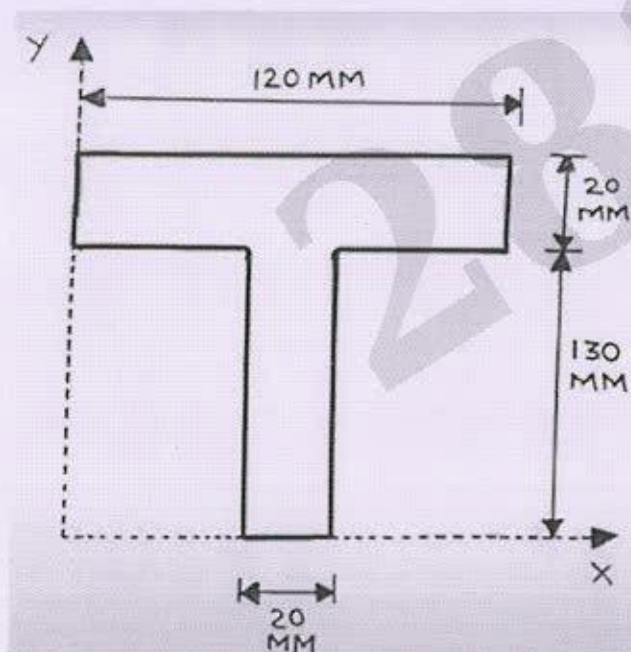
[12]



- Q.3. a) State the principle of virtual work? (3 Marks) [11]
 b) Find the reaction at support A & B for the beam shown below? (8 Marks)



- Q.4. a) State parallel axis theorem? (3 Marks) [12]
 b) Find Moment of Inertia for the given shape with respect to X & Y axis? (9 Marks)



- Q.5. SECTION-II [11]
 a) State and explain De Alembert's principle? (3 Marks)
 b) A man weighing 750 N stands on the floor of a lift, Determine the Force exerted on the floor when,
 1. The lift moves upward with an acceleration of 2.5 m/s^2
 2. The lift moves downward with an acceleration of 2.5 m/s^2
 (8 Marks)

- Q.6. a) State Impulse Momentum Principle. (3 Marks) [12]
 b) A 1500 N block is in contact with a level plane, the coefficient of friction between two contact surfaces being 0.1. If the block is acted upon by a horizontal force of 300 N, what time will be required before the block reaches a velocity of 16m/s starting from rest? If 300 N Force is then removed how much time will the block continue to move? Solve the problem by impulse momentum equation? (9 Marks)
- Q.7. a) Define centripetal acceleration, centrifugal acceleration, banking of roads? [11]
 (3 Marks)
 b) A motor cycle is moving in a spherical cage of 3.6 m radius in a circus show. The mass of the motor cycle and the rider together is 240 Kg. What shall be the minimum speed with which the motor cyclist can pass through the highest point without losing the contact inside the cage? If he is moving with 36 Kmph, what force is transmitted to the cage.
 At highest position, the centrifugal force acting upwards = $P_c = mv^2/r$

$$P_c = \frac{mv^2}{r}$$
 (8 Marks)
- Q.8. a) State and explain coefficient of restitution? (3 Marks) [12]
 b) A body of mass 3 Kg moving with a velocity of 3m/s collides directly on another body of mass 6 Kg moving with a velocity of 2m/s in opposite direction. If the coefficient of restitution is 0.6; find the velocity of ball after impact & loss of Energy? (9 Marks)

Seat No.

QP Code: 3501QP

Total No. of Pages: 3

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71810_Engineering Mathematics - I_03.04.2023_10.30 AM To 01.00 PM

Subject Code: 71810

Day and Date: Monday, 03-04-2023

Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

1) Figures to the right indicate full marks

Special Instruction.:

1) Attempt any three questions from each section. 2) Use of non-programmable calculator is allowed.

Q.1. SECTION-I [12]
Solve the following.

a) Reduce to Normal form and find the rank of matrix $\begin{bmatrix} 1 & 1 & 1 & -1 \\ 1 & 2 & 3 & 4 \\ 3 & 4 & 5 & 2 \end{bmatrix}$ [6]

b) Test for consistency and if possible, solve the equations [6]

$$x + y + z = 2, \quad 2x + 2y - z = 1, \quad 3x + 4y + z = 9$$

Q.2. Solve the following [11]

a) Find Eigen values of the matrix $\begin{bmatrix} 9 & -1 & 9 \\ 3 & -1 & 3 \\ -7 & 1 & -7 \end{bmatrix}$ [5]

b) Verify Cayley-Hamilton Theorem for the matrix $\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ [6]

Q.3. Solve the following [11]

a) Simplify $\frac{(\cos 2\theta - i \sin 2\theta)^5 (\cos 3\theta + i \sin 3\theta)^6}{(\cos 4\theta + i \sin 4\theta)^7 (\cos \theta - i \sin \theta)^8}$ [5]

b) Find all values of the $\left(\frac{1}{2} + i \frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$ [6]

Q.4. Attempt any two of the following. [12]

a) Solve the following equations [6]

$$2x_1 - x_2 + 3x_3 = 0, 3x_1 + 2x_2 + x_3 = 0, x_1 - 4x_2 + 3x_3 = 0$$

b) Find the Eigen values and Eigen vector of the greatest Eigen value of the [6]

$$\text{matrix} \begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

c) Using De Moivre's Theorem Prove that [6]

$$\frac{\sin 5\theta}{\sin \theta} = 16\cos^4\theta - 12\cos^2\theta + 1$$

Q.5. SECTION-II [12]
Solve the following.

a) Apply Gauss-Jordan method to solve the equations [6]

$$x - y + 2z = 5, 3x + 2y + z = 10, 2x - 3y - 2z = -10$$

b) Use Jacobi's iteration method to solve the equations [6]

$$15x + 2y + z = 18, 2x + 20y - 3z = 19, 3x - 6y + 25z = 22$$

Q.6. Solve the following [11]

a) Using Maclaurin's series prove that [6]

$$\log(1 + \tan x) = x - \frac{x^2}{2} + \frac{2x^3}{3} - \dots$$

b) Expand $f(x) = x^4 - 3x^3 + 2x^2 - x + 1$ in powers of $(x-3)$ using Taylor's series. [5]

Q.7. Solve the following [11]

a) If $z = x^y$, prove that $\frac{\partial^2 z}{\partial x \partial y} = \frac{\partial^2 z}{\partial y \partial x}$ [6]

b) If $u = \log\left(\frac{\sqrt{x^2 + y^2}}{x + y}\right)$ then find $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$ [5]

Q.8. Attempt any two of the following.

[12]

a) Use Gauss-Seidel method to solve the equations

[6]

$$10x + 2y + z = 9, \quad 2x + 20y - 2z = -44, \quad -2x + 3y + 10z = 22$$

b) Evaluate $\lim_{x \rightarrow 1} (x^2 - 1) \tan\left(\frac{\pi x}{2}\right)$

[6]

c) Determine extreme values of the function $f(x, y) = x^3 + y^3 - 3xy$.

[6]

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Seat No.

QP Code: 6534QP

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71811 - Engineering Physics_03.08.2023_10.30 AM To 01.00 PM
Subject Code: 71811

Day and Date: - Thursday, 03-08-2023

Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

1. Section I : Question No. 1 to 4 2. Section II : Question No. 5 to 8 3. Attempt any three questions from each section. Given Data: a) Avogadro's number, $N = 6.023 \times 10^{26}$ /kg. atom b) Mass of electron $= 9.1 \times 10^{-31}$ kg c) Charge on electron $= 1.6 \times 10^{-19}$ C d) Speed of light $C = 3 \times 10^8$ m/s a) Planck's Constant, $h = 6.63 \times 10^{-34}$ J.s

Q.1.

- a) Define Grating element and obtain the equation for maximum intensity for diffraction grating. (06) [12]
- b) Diffraction Grating has 6000 lines per cm. Find the angular separation of two yellow lines of wavelength 5770 AU and 5791 AU in second order. (06)

Q.2.

- a) What is holography? Explain the construction and reconstruction of hologram. (06) [11]
- b) Explain the term: acceptance angle, acceptance cone, Numerical aperture. (05)

Q.3.

- a) Explain basic requirements for acoustically good hall. (06) [11]
- b) The Volume of the hall is 3398.4 m³ and its total absorption equal to 92.90 O.W.U. Entry of people inside the hall raises the absorption by 185.50 O.W.U. Calculate the change in the reverberation time. (05)

Q.4. Answer any two from the following questions.

- a) Explain construction and working of Laurent's half shade polarimeter. (06) [12]
- b) 1) Describe the basic principle of fiber optics. (03)
- 2) Determine the numerical aperture of a step index fiber, when the core refractive index is 1.5 and cladding refractive index is 1.48. (03)
- c) 1) Explain the term reverberation. (03)
- 2) A hall has volume of 7500 m³. It is required to have reverberation time of 1.5 sec. what should be the total absorption in the hall (03)

Q.5.

- a) Explain axis of symmetry and plane of symmetry in a cubic crystal system. (06) [12]
- b) 1) Calculate the interplanar spacing for (221) planes in simple cubic lattice, where lattice constant is 4.2 AU. (03)
- 2) Draw (010), (011), (111) planes of a cubic crystal system (03)

Q.6.

- a) With neat diagram explain construction and working of scanning tunnelling Microscope. (06) [11]
- b) What is bottom-up approach for production of nano material? Explain colloidal method of production of nano material. (05)

Q.7.

[11]

- a) State Compton effect. With suitable diagram explain experimental arrangement used to study Compton effect. (06)
- b) 1) Calculate the de Broglie wavelength of the earth, taking the mass of the earth to be 6×10^{24} kg. Orbital velocity of the earth 3×10^4 m/s. (02)
- 2) Calculate the de Broglie wavelength associated with an electron accelerated through energy of 2 keV. (03)

Q.8. Answer any two from the following questions.

[12]

- a) Define atomic radius and find its values for SC, BCC, & FCC Structure. (06)
- b) Why properties of material changes at nano level? State and explain different properties of nano-material. (06)
- c) State and explain Heisenberg's uncertainty principle for position and momentum. (06)

Seat No.

QP Code: 6524QP

Total No. of Pages: 2

Summer Examination March - 2023Subject Name: B.Tech. CBCS_72500 - Engineering Mathematics - II_24.07.2023_10.30 AM To 01.00 PM
Subject Code: 72500

Day and Date: - Monday, 24-07-2023

Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions:

1) Figures to the right indicate full marks

Special Instruction:

1) Attempt any three questions from Q.1 to Q.4. 2) Attempt any three questions from Q.5 to Q.8. 3) Use of non-programmable calculator is allowed.

Q.1. a) Solve $\frac{dy}{dx} + \frac{y \cos x + \sin y + y}{\sin x + x \cos y + x} = 0$ [6] [12]

b) Solve $(x^4 e^x - 2mxy^2)dx + 2mx^2ydy = 0$ [6]

Q.2. a) Find the orthogonal trajectory of $r = \frac{2a}{1 - \cos \theta}$ where a is parameter. [5] [11]

b) In a circuit containing resistance R , inductance L and a constant e.m.f. E .

the current i is given by $L \frac{di}{dt} + Ri = E$. If the initial current is zero, show that the current builds up to half its theoretical maximum value in $\frac{L}{R} \log 2$ sec. [6]

Q.3. a) Use Taylor's series method to solve $\frac{dy}{dx} = x^2y - 1$, with $y(0) = 1$ at $x = 0.03$. [6] [11]

b) Using Euler's method, find the approximate value of y at $x = 1$ when $\frac{dy}{dx} = x^2 + y^2$, with $y(0) = 1$ taking $h = 0.2$. [5]

Q.4. Attempt any TWO of the following [12]

a) Solve $\frac{dy}{dx} + (2x \tan^{-1} y - x^3)(1 + y^2) = 0$ [6]

b) Water heated to 100°C cools to 88°C in first 10 minutes in a room temperature

of 25°C , find the temperature of water in next 20 minutes. [6]

c) Apply Runge-Kutta's method of fourth order to solve

$\frac{dy}{dx} = x + y^2$, with $y(0) = 1$ at $x = 0.1$ taking $h = 0.1$. [6]

Q.5. a) Find a positive root of the equation $x^3 - 2x - 5 = 0$ using the Bisection method correct to three decimal places. [6] [12]

b) Find the root of the equation $x^3 + x^2 + x + 7 = 0$ correct to three decimal places using Secant method. [6]

Q.6. a) Evaluate $\int_0^{\infty} \frac{x^2}{7^x} dx$ [5] [11]

b) Evaluate $\int_0^{\infty} \frac{x^2 (1+x^4)}{(1+x)^{16}} dx$ [6]

Q.7. a) Evaluate $\int_0^1 \int_{y^2}^y (1+xy^2) dx dy$ [5] [11]

b) Change the order of integration and evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \frac{e^y}{(e^y+1)\sqrt{1-x^2-y^2}} dy dx$ [6]

Q.8. Attempt any Two of the following. [12]

a) Find the real root of the following equation, correct to three decimal places using Newton-Raphson method $x^4 - x - 9 = 0$. [6]

b) Express $\operatorname{erf}(x)$ as an infinite series and find $\operatorname{erf}(0.5)$. [6]

c) Find the area common to the parabolas $y^2 = 4ax$ and $x^2 = 4ay$. [6]

Seat No.

QP Code: 6713QP

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71820 _ Basic Mechanical Engineering_12.08.2023_10.30 AM To 01.00 PM

Subject Code: 71820

Day and Date: - Saturday, 12-08-2023

Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

1) Figures to the right indicate full marks

Special Instruction.:

1) Attempt any three questions from each section 2) Assume suitable data if necessary and mention it clearly. 3) Use of non-programmable calculator is allowed.

-
- Q.1. SECTION - I [12]
a) Define heat and work. State different forms of work. (6)
b) At the inlet of a nozzle the enthalpy of fluid passing is 2800 kJ/kg and velocity is 50 m/sec. At the discharge the enthalpy is 2600 kJ/kg. The nozzle is horizontal. Find the velocity at exit of nozzle. (6)
- Q.2. [12]
a) Describe the working of four stroke SI engine with neat sketch (6)
b) Represent Carnot cycle on T-S diagram and obtain expression of air standard efficiency (6)
- Q.3. [11]
a) Define the following terms:- (6)
i) Relative Humidity
ii) Dry Bulb Temperature
iii) Wet Bulb Temperature
b) Differentiate between Vapour compression refrigeration and Vapour absorption refrigeration system (5)
- Q.4. [12]
Write short notes: (12)
i) Properties of good refrigerant
ii) Comfort Air conditioning
iii) PMM-I and PMM-II
- Q.5. SECTION - II [12]
a) Differentiate renewable and non-renewable energy sources. Enlist Different Applications of Solar energy. (6)
b) Explain construction and working of Photovoltaic cells. (6)
- Q.6. [12]
a) Explain with neat sketch construction and working of centrifugal pump. Give its application (5)
b) In flat belt drive the initial tension is 2000N. the coefficient of tension between the belt and pulley is 0.3 and angle of lap on smaller pulley is 150 degree. Smaller pulley has diameter of 200 mm and rotates at 500 rpm. Find power in kW transmitted by belt (7)
- Q.7. [12]
a) Define Manufacturing process. Explain Drilling in Detail (6)
b) Explain basic steps involved in casting process (6)

- Q.8. a) Explain with neat sketch the parabolic collectors (6)
b) Write note on wind mill (5)

[11]

Seat No.

QP Code: 6575QP

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71818 - Fundamentals of Electronics and Computer_02.08.2023_10.30 AM To 01.00 PM

Subject Code: 71818

Day and Date: - Wednesday, 02-08-2023
Time: - 10:30 am to 01:00 pm

Total Marks: 70

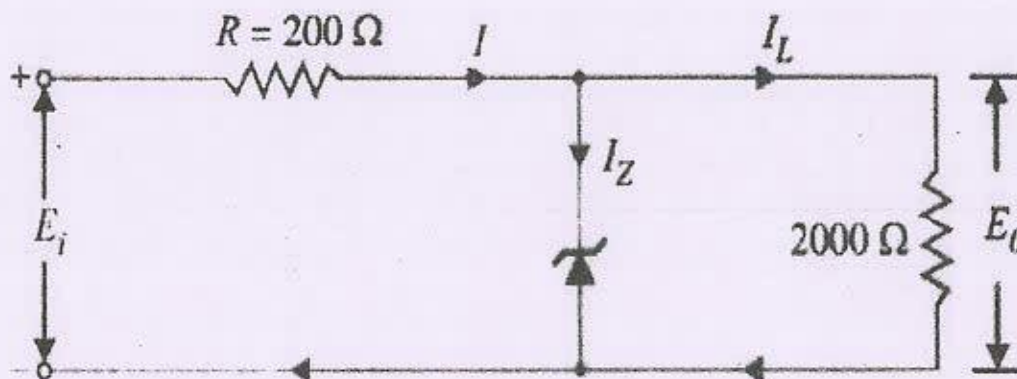
Instructions.:

- 1) Figures to the right indicate full marks
- 2) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

Attempt any THREE questions from Que no 1, 2, 3 and 4. and Attempt any THREE questions from Que no 5,6,7, and 8.

- Q.1. Solve the following: [12]
1. Explain full wave bridge rectifier with necessary waveforms.
2. Explain basic gates and NAND as universal gate with its truth table.
- Q.2. Solve the following: [11]
1. What is multiplexer? Explain 4:1 mux with truth table.
2. Write a short note on a) Microwave oven b) Tachometer
- Q.3. Solve the following: [11]
1. Explain the following terms with respect to diode i) Break down voltage
ii) Knee voltage iii) Peak inverse voltage iv) Maximum power rating
2. What is Binary adder? Explain Half adder with suitable truth table and logic diagram.
- Q.4. Solve the following: [12]
1. Explain principle of operation and working of LVDT with neat diagram and transfer characteristics.
2. Over what range of input voltage will the zener circuit shown in below figure maintain 30 V across 2000 Ω load, assume that series resistance $R = 200 \Omega$ and zener current rating is 25 mA.



- Q.5. Solve the following: [12]
1. Convert the following number system
 - i) $(1101001.011)_2$ to Decimal
 - ii) $(657.40625)_{10}$ to Binary
 - iii) $(74B7.C1)_{16}$ to Decimal
 2. Explain different Network Topologies use in a computer network.
- Q.6. Solve the following: [11]
1. Explain following Linux commands. i) Ls ii) mkdir iii) Cd
 2. What are different hardware components of computer system. Explain any four of them.
- Q.7. Solve the following: [11]
1. Define the algorithm? Write an algorithm to find the largest among three different numbers.
 2. Give the classification of computers based on their speed.
- Q.8. Solve the following: [12]
1. Enlist and elaborate on various input devices of the computer system.
 2. Explain different types of operating system.



Seat No.

QP Code: 6547QP
Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71817 - Engineering Chemistry_05.08.2023_10.30 AM To 01.00 PM
Subject Code: 71817

Day and Date: - Saturday, 05-08-2023
Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Use Sketches/Diagrams wherever necessary

Special Instruction.:

Section I: Q1 - Q4 Section II: Q5 - Q8 Attempt any three questions from each section

- Q.1. i) A sample of water on analysis was found to contain the following impurities; [12]**
[Marks 6]

	Wt. mg/lit	Mol. wt.
Ca(HCO ₃)	40.50	162
Mg(HCO ₃) ₂	36.50	146
CaCl ₂	27.75	111
MgSO ₄	30.00	120

Calculate temporary, permanent and total hardness of water in degree Clark.

- ii) Explain ion exchange process for the treatment of hard water..[Marks 6]

- Q.2. i) Explain construction and working of GLC with a neat labeled diagram. 6 [11]**
ii) State and derive the expression for Beer's Law. 5
- Q.3. i) Give the preparation, properties and applications of Epoxy resin. 6 [11]**
ii) Distinguish between Thermosoftening and Thermosetting plastics. 5
- Q.4. Attempt Any Three 12 [12]**
i) Write a note on Dissolved Oxygen of water.
ii) Write a note on impurities present in natural water.
iii) Discuss the advantages and disadvantages of instrumental methods of analysis.
iv) Discuss any four applications of conducting polymer.
v) Give composition, properties and applications of FRP.
- Q.5. i) In Boys Calorimeter experiment, following observations were recorded. [12]**
i) Volume of fuel sample burnt = 0.09 m³
ii) Wt. water circulated through copper tube = 30.5 kg.
iii) mass of steam condensed = 0.035 kg
iv) Rise in temperature = 10 °C
v) Latent heat of condensation of steam = 587 K Cal/kg
vi) Specific heat of water = 4.18 KJ/Kg °C
Calculate the gross and net calorific value of the fuel. 6
ii) Draw a neat labeled diagram of Bomb calorimeter and discuss the working. 6
- Q.6. i) Define corrosion. Discuss atmospheric corrosion with example. 6 [11]**
ii) Discuss the factors influencing the rate of corrosion. 5
- Q.7. i) Define alloy. What are the purposes of making alloys. 6 [11]**
ii) Give the composition, properties and applications of Alnico and Nichrome. 5

Q.8.

Attempt Any Three

12

[12]

- i) Compare liquid fuels with gaseous fuels.
- ii) Write a note on electroplating.
- iii) Explain the terms - Calorific value, Higher Calorific value & Lower Calorific value.
- iv) Give composition, properties and applications of Duralumin.
- v) Discuss the protection of metal from corrosion by proper design and material selection.

Seat No. **Summer Examination March - 2023**

Subject Name: B.Tech. CBCS_71813 - Basic Civil Engineering_04.08.2023_10.30 AM To 01.00 PM

Subject Code: 71813

Day and Date: - Friday, 04-08-2023

Total Marks: 70

Time: - 10:30 am to 01:00 pm

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Use Sketches/Diagrams wherever necessary
- 4) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

1. Attempt any three questions from Q1 to Q4 and any three questions from Q5 to Q8

-
- Q.1. a) Enlist and discuss the scope of various sub-branches of civil Engineering. [12]
(6)
b) What is meant by building bye laws? Write down specific bye laws for Set back distance (6)
- Q.2. a) Explain with neat sketch different elements of superstructure. (5) [11]
b) What is bearing capacity of soil? Which are the methods of improving bearing capacity of soil (6)
- Q.3. a) Differentiate between Load Bearing structure and framed structure (6) [11]
b) Explain grades of concrete and their significance. (5)
- Q.4. Attempt any three [12]
a) Enlist various subbranches of civil engineering. Explain Environmental engineering in details. (4)
b) Write a note on Well foundation (4)
c) Write a note on 'Ready mix concrete'. (4)
d) What are the characteristics of good brick (4)
- Q.5. a) Convert the following reduced bearings into whole circle bearings: (i) N 65° E (ii) S 43° 15' E (iii) S 52° 30' W (iv) N 32° 45' W (v) N 60 E (5) [11]
b) How is chaining, Ranging and offsetting carried out in Traverse Survey? (6),
- Q.6. a) Define following terms- a) Reduced level b) Contour line c) Bench Mark d) Levelling e) Axis of bubble tube (5) [12]
b) The following consecutive readings were taken with 3.0m level on a continuously sloping ground. (7)
0.600, 1.235, 1.860, 2.575, 0.235, 0.915, 1.935 and 2.870.
The reduced level of the first point was 192.125 m. Calculate the reduced levels of points by Rise and fall method. Apply the check
- Q.7. a) Draw a Flow diagram of Water Supply Scheme (5) [11]
b) What are the different types of Rail Gauges? Explain in brief (6)

Q.8. Write any THREE short notes from the following:

[12]

- a) Types of Errors in Chaining (4)
- b) Correction for local attraction (4)
- c) Characteristics of contour lines (4)
- d) Gravity Dam (4)

Seat No. **January - February (Winter) Examination - 2023**

Subject Name: B.Tech. CBCS_71811_Engineering Physics_16.03.2023_10.30 AM To 01.00 PM

Subject Code: 71811

Day and Date: Thursday, 16-03-2023

Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

1. Section I : Question No. 1 to 4 2. Section II : Question No. 5 to 8 3. Attempt any three questions from each section. Given Data: a) Avogadro's number, $N = 6.023 \times 10^{26}$ /kg. atom b) Mass of electron $= 9.1 \times 10^{-31}$ kg c) Charge on electron $= 1.6 \times 10^{-19}$ C d) Speed of light $C = 3 \times 10^8$ m/s e) Planck's Constant, $h = 6.63 \times 10^{-34}$ J.S

Q.1.

[12]

- a) What is grating? Explain the use of grating to determine wavelength of different spectral lines of mercury (06)
- b) Explain the phenomenon of double refraction and distinguish between positive and negative crystals (06)

Q.2.

[11]

- a) Explain the following terms in brief (06)
 - 1) Population inversion
 - 2) Metastable state
 - 3) Stimulated emission
- b) A Silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.5 and cladding refractive index of 1.47. Determine numerical aperture and acceptance angle for optical fiber. (05)

Q.3.

[11]

- a) Define and explain in brief 1) reverberation 2) reverberation time 3) absorption Coefficient (06)
- b) A room has a volume of 1000 m³, the total wall area is 200 m², the total floor area is 100 m², and the total ceiling area is 100 m². The average sound absorption coefficient for wall is 0.02, ceiling is 0.8 and floor is 0.05. Determine the average absorption coefficient and the reverberation time. (05)

Q.4. **Answer any two from the following questions.**

[12]

- a) 1) Find the minimum Number of lines in a plane diffraction grating required to just resolve the sodium doublet of wavelength 5890 A.U. and 5896 A.U. in the second order. (03)
- 2) Calculate the specific rotation if the plane of polarization is turned through 26.40 deg., when travel through 20 cm length 20% sugar solution (03)
- b) What are the advantages of optical fiber? (06)
- c) Explain various factors affecting acoustics of hall with their remedy. (06)

Q.5.

[12]

- a) 1) Derive Bragg's Law for X-ray diffraction. (04)
- 2) The first order reflection from the plane of NaCl is obtained at an angle of 20 deg. with the incident beam. If the interplanar spacing is 2.5 A.U., then calculate the wavelength of X-rays used. (02)
- b) 1) Derive the relation between Lattice constant (a) & density (ρ) of cubic crystal. (03)
- 2) Copper has FCC structure and the atomic radius is 1.278 A.U. Calculate its density. Given- Molecular weight of copper is 63.54 (03)

Q.6.

[11]

- a) Define nano material and explain with neat diagram top down and bottom-up approach of synthesis of nano material. (06)
- b) Discuss the applications of nano material. (05)

Q.7.

[11]

- a) What is dual nature of radiation? Derive an expression for de Broglie wavelength in terms of kinetic energy (E). (06)
- b) X-rays of 1 A.U. wavelength are scattered from a carbon block and the scattered radiation is viewed at an angle 90 deg. to the incident beam. Find Compton shift $\Delta\lambda$ and kinetic energy imparted to the recoiling electron. (05)

Q.8. Answer any two from the following questions.

[12]

- a) Define atomic radius and find its values for SC, BCC, & FCC Structure. (06)
- b) What do you mean by tunneling of an electron? With neat diagram explain construction and working of scanning tunneling Microscope. (06)
- c) Write note on properties of matter waves. (06)

Seat No. **January - February (Winter) Examination - 2023**

Subject Name: Master of Technology (CBCS)_72028_MATHEMATICAL FOUNDATIONS OF COMPUTER
SCIENCE_14.03.2023_10.30 AM To 01.30 PM

Subject Code: 72028

Day and Date: Tuesday, 14-03-2023
Time: 10:30 am to 01:30 pm

Total Marks: 70

Instructions.:

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks
- 3) Use of Scientific calculator is allowed

Q.1. a) State & explain following types of proofs. (8 M) [15]

1. Proof by construction
2. Proof by contradiction

b) Design DFA that accepts language $(0+1)^*10$. (7 M)

Q.2. a) Define DFA. With a suitable. With a suitable DFA and an example string, [15]

explain how computations are done by DFA. (8 M)

b) For $t \geq 0$, prove by induction that (7 M)

$$P_t = PM^t - Y \left(\frac{M^t - 1}{M - 1} \right)$$

Q.3. a) Explain ambiguity in CFG with example. (8 M) [15]

b) State & explain PDA & its equivalence with CFG. (7 M)

Q.4. a) Define decidable language. Prove that EDFA is decidable language. (8 M) [15]

Or

Explain PCP. Show that PCP is undecidable. (7 M)

b) Prove that HATLTM is undecidable. (8 M)

Or

Prove that EQDFA is decidable language. (7 M)

Q.5. Solve any 2 (5 Mark Each) [10]

1. Context Free Grammar
2. Equivalence of DFA & NFA
3. Halting problem
4. Diagonalization technique

Seat No.	
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January - February (Winter) Examination - 2023

Subject Name: Master of Technology (CBCS)_72030_ADVANCED ALGORITHMS_18.03.2023_10.30 AM To 01.30 PM

Subject Code: 72030

Day and Date: Saturday, 18-03-2023
Time: 10:30 am to 01:30 pm

Total Marks: 70**Instructions.:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks
- 3) Assume suitable data wherever necessary and mention it boldly

-
- Q.1. Solve any 2 of the following (7 Marks Each) [14]**
- a. Difference between Las-Vegas and Monte Carlo Algorithm
 - b. Explain Optimal merge patterns with example?
 - c. Explain dynamic programming method in general with example?
- Q.2. Solve any 2 of the following (7 Marks Each) [14]**
- a. Explain Cook's Theorem
 - b. With suitable examples explain how to derive lower bound for problem using lower bound through reductions technique
 - c. How oracles and adversary arguments can be used to establish lower bound?
- Q.3. Solve any 2 of the following (7 Marks Each) [14]**
- a. List and Explain Np-Hard Graph Problems.
 - b. Explain the relationship between P, NP, NP-Complete, NP-Hard problems with neat diagram.
 - c. Write a note on:
 - I. Performance analysis of Algorithms
 - II. Efficiency and Speedup in PRAM
- Q.4. Solve any 2 of the following (7 Marks Each) [14]**
- a. List and explain Variants of PRAM.
 - b. Write a list ranking algorithm and explain with the help of example.
 - c. Explain packet routing on mesh
- Q.5. Solve any 2 of the following (7 Marks Each) [14]**
- a. Explain Broadcasting in hypercube.
 - b. Explain Partial Permutation Routing using greedy and randomized algorithm on hypercube
 - c. Write indexing schemes in mesh and explain prefix computation using one indexing scheme.

Seat No.

QP Code: 3264QP

Total No. of Pages: 2

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71817_Engineering Chemistry_18.03.2023_10.30 AM To 01.00 PM

Subject Code: 71817

Day and Date: Saturday, 18-03-2023

Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Use of Scientific calculator is allowed
- 3) Use Sketches/Diagrams wherever necessary

Special Instruction.:

Section I: Q1 - Q4 Section II: Q5 - Q8 Attempt any three questions from each section

Q.1.	i)	A sample of water on analysis was found to contain the following impurities;		[12]
		Wt. mg/lit	Mol. wt.	
		Ca(HCO ₃) ₂	65	162
		Mg(HCO ₃) ₂	75	146
		CaSO ₄	84	136
		Mg(NO ₃) ₂	37	148
		Calculate temporary, permanent and total hardness of water in degree Clark.		6
	ii)	Define hardness of water. Explain temporary and permanent hardness.		6
Q.2.	i)	With a neat labeled diagram, explain the construction and working of GLC.	6	[11]
	ii)	State Beer - Lamberts Law and derive expression for it.	5	
Q.3.	i)	Give the preparation properties and application of Urea formaldehyde plastic.	6	[11]
	ii)	Explain condensation polymerization reaction with suitable example.	5	
Q.4.		Attempt Any Three	12	[12]
	i)	Write a note on Chloride content of water.		
	ii)	Write note on ill effects of sludge and scale formation in boiler.		
	iii)	Write any four applications of Conducting polymers.		
	iv)	Distinguish between Thermosoftening and Thermosetting plastic.		
	v)	Give composition, properties and applications of GRP.		
Q.5.	i)	Following results were recorded in Bomb calorimeter experiment. Calculate the gross and net calorific value of the fuel contains 5.6 hydrogen and latent heat of condensation of steam as 587cal/gm. Weight of coal burnt = 0.21 gm Mass of water in calorimeter = 2500 gm Water equivalent of calorimeter = 571 gm Observed rise in temperature = 2.28°C Cooling correction = 0.026°C Fuse wire correction = 15.5 Cal Acid Correction = 40Cal	6	[12]
	ii)	Explain Boy's calorimeter with neat labeled diagram.	6	
Q.6.	i)	Define electrochemical corrosion. Discuss hydrogen evolution mechanism with example.	6	[11]
	ii)	Discuss the protection of metal from corrosion by proper design and material selection.	5	
Q.7.	i)	Give composition, properties and applications of plain carbon steels	6	[11]
	ii)	Write composition, properties and applications of Duralumin and Alnico.	5	

Q.8.

Attempt Any Three

12

[12]

- i) Discuss any four characteristics of a good fuel.
- ii) Enlist any four principles of Green Chemistry.
- iii) Discuss any four factors influencing the rate of corrosion.
- iv) Write composition, properties and applications of Brass.
- v) What is hot dipping process? Write a note on tinning.

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71818_Fundamentals of Electronics and Computer_23.03.2023_10.30 AM To 01.00 PM

Subject Code: 71818

Day and Date: Thursday, 23-03-2023
Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

- 1) Figures to the right indicate full marks
- 2) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

Attempt any THREE questions from Que no 1, 2, 3 and 4. and Attempt any THREE questions from Que no 5,6,7, and 8.

Q.1. Solve the following: [12]

1. Explain FW rectifier using center tap transformer with necessary waveform.
2. Explain full adder circuit with truth table.

Q.2. Solve the following: [11]

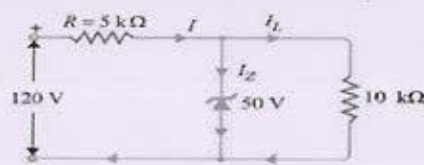
1. What is De- Multiplexer? Explain 1:8 De-mux with truth table
2. Write a short note on a) Weighing machine b) Digital Thermometer

Q.3. Solve the following: [11]

1. Explain transistor as a common emitter amplifier with suitable circuit diagram and waveforms.
2. Realize the logic equation $Y = (A+B)(C+D)$ using i) OR and AND gate ii) only NOR gate

Q.4. Solve the following: [12]

1. Explain different types of strain gauges.
2. For the zener circuit shown in below figure find i) the output voltage ii) the voltage drop across series resistance iii) current through zener diode



Q.5. Solve the following: [12]

1. Convert following number system
 - i) 111101.0110 Binary to Decimal
 - ii) 4B27 Hexadecimal to Decimal
 - iii) 185 Decimal to Binary
2. Discuss the different generations of computers.

Q.6. Solve the following: [11]

1. Explain Programming Control Structures for computer programming.
2. Explain different types of networks.

Q.7. Solve the following:

[11]

1. What is a flow chart? Draw a flowchart for find the largest among three different numbers entered by the user.
2. Enlist and elaborate various output devices of computer system.

Q.8. Solve the following:

[12]

1. Enlist and elaborate any five applications of computers.
2. Explain different types of operating system.

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Seat No.	
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QP Code: 3325QP

Total No. of Pages: 2

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71820_Basic Mechanical Engineering 31.03.2023_10.30 AM To 01.00 PM

Subject Code: 71820

Day and Date: Friday, 31-03-2023
Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions:

1) Figures to the right indicate full marks

Special Instruction:

1) Attempt any three questions from each section 2) Assume suitable data if necessary and mention it clearly. 3) Use of non-programmable calculator is allowed.

Q.1. SECTION I [12]

- a) Define thermodynamic state, thermodynamic process and thermodynamic cycle. (6)
- b) In a gas turbine power plant the gases flow through the turbine is 15 kg/sec. and the power developed by turbine is 12000 kW. The enthalpies of gases at the inlet and outlet are 1260 kJ/kg and 400 kJ/kg respectively. The velocities of gases at the inlet and outlet are 50 m/sec. and 110 m/sec. Calculate the rate at which the heat is rejected. (6)

Q.2. [12]

a) Compare C. I Engine with S. I Engine (6)

b) Represent Joule cycle on P-V diagram and obtain expression of air standard efficiency (6)

Q.3. [11]

a) Explain working of vapour absorption refrigeration system (6)

b) Define the following terms (5)

1. Dry air
2. Moist air
3. Saturated air
4. Degree of saturation
5. Specific Humidity

Q.4. [12]

Write short notes: (12)

1. Solar refrigeration system.
2. Assumption in air standard cycles.
3. PMM-I and PMM-II.

Q.5. [12]

SECTION II

a) Draw a layout of hydroelectric power plant and explain its working (6)

b) What is Biodiesel? State its advantages and limitations (6)

Q.6. [12]

a) Explain reciprocating air compressor with Neat Sketch (5)

b) A cross belt connects two pulleys of 500 mm diameter, 2 m apart. The initial tension in the belt is 500 N, if the co-efficient of friction between belt and pulley is 0.3. Find the power transmitted at 700 rpm. Also calculate the length of belt (7)

Q.7. [11]

a) Explain Metal removing Processes in detail (5)

b) Explain any two Metal Joining process (6)

Q.8. [11]

a) Compare belt, chain and gear drive (5)

b) Explain with neat sketch the parabolic collectors (6)

-
- An isometric drawing of a mechanical component. The part has a base plate with a total width of 100 and a depth of 40. On the left side, there is a vertical plate of width 25 and height 95, with a semi-circular top of radius R5. A horizontal plate of width 30 and height 10 is attached to the top of this vertical plate. In the center, there is a vertical plate of width 25 and height 25, with a semi-circular top of radius R20. A horizontal plate of width 30 and height 10 is attached to the top of this vertical plate. On the right side, there is a vertical plate of width 25 and height 30, with a semi-circular top of radius R40. A horizontal plate of width 30 and height 10 is attached to the top of this vertical plate. The part features several holes: a hole of diameter $\phi 10$ in the left vertical plate, a hole of diameter $\phi 10$ in the central vertical plate, and a hole of diameter $\phi 12$ in the right vertical plate. The part is shown with a section line X-X, indicating a cross-section.

Seat No. _____

Total No. of Pages: 5

Subject Name: B.Tech. CBCS 71814 Engineering Graphics 29.03.2023 10.30 AM To 02.00 PM

Total Marks: 70

Instructions.:

Special Instruction.:

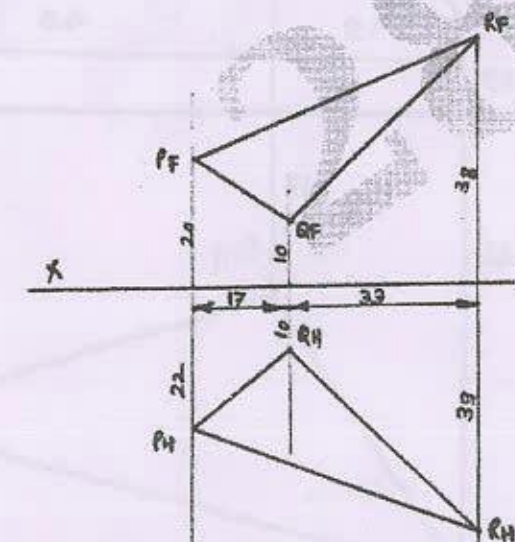
1) Solve any one question from Que. 1 and Que 2. 2) Solve any one question from Que. 5 and Que 6. 3) Attempt remaining four questions (Compulsory). 4) Use both side of drawing paper. 5) All dimensions are in mm.

SECTION- I

[15]

i) The top view of 75 mm long line AB measures 65 mm, while the length of its front view is 50 mm. It's one end A is 10 mm above HP and 12 mm Infront of VP. Draw the projections of AB and determine its inclinations with HP and VP

ii) Find angle made by plane PQR with HP and perimeter of plane PQR. Ref. fig [05]



b) A pentagonal plane lamina of sides 30 mm is resting on the HP on one of its corners so that the surface makes an angle of 60 degree with the HP. If the side opposite to this corner makes an angle of 30 degree with VP and is parallel to HP, draw FV and TV of the pentagon.

[10]

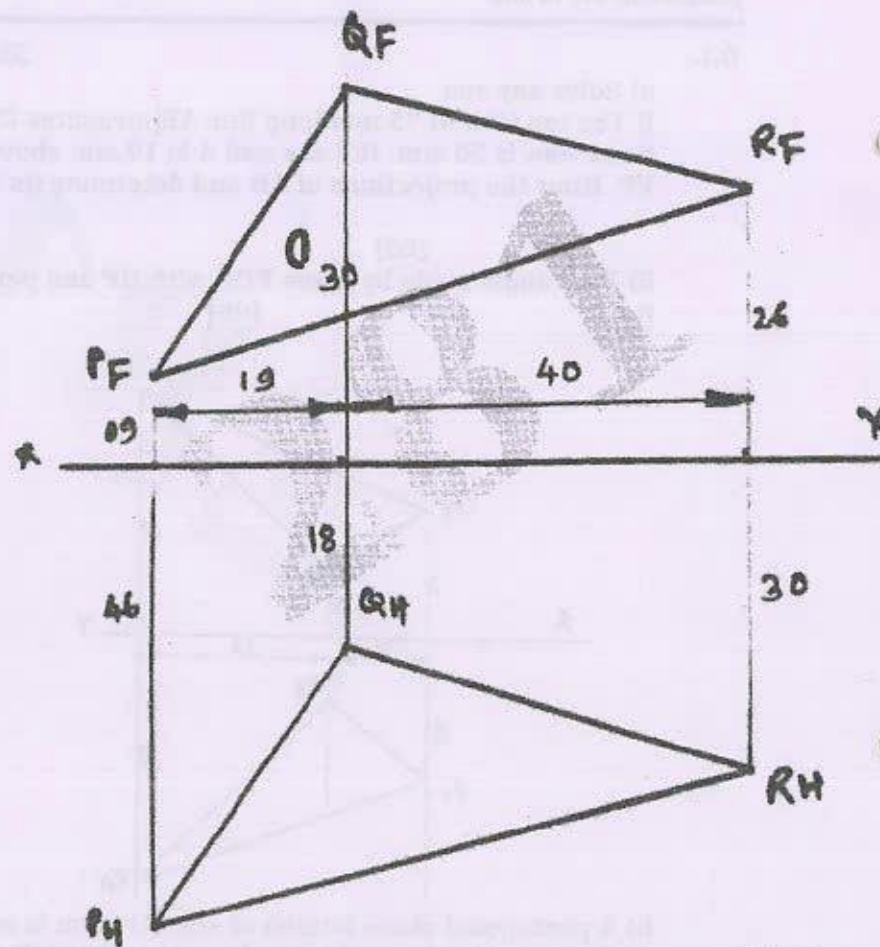
Q.2. a) Solve any one

i) Line AB is 75 mm long. Its FV and TV measures 50 mm and 60 mm. End A is 10 mm above HP and 15 mm Infront of VP. Draw projections of line AB and find angles with HP and VP

[05]

ii) Draw the true shape of the plane PQR

[05]



b) An isosceles triangular plate of 50 mm base and 75 mm altitude appears as an equilateral triangle of 50 mm in TV. Draw the projections of a plate if its 50mm long edge is on the HP and inclined 45 degree to the VP.

[10]

Q.3. A right circular cylinder with 50 mm diameter and height 70 mm rest on HP such that the base is inclined at 60 degree to HP and top view of axis is inclined 45 degree to VP

[10]

Q.4. Solve any two

a) Construct a hyperbola when the distance of focus from the directrix is 65 mm and eccentricity is 1.5.

[05]

b) A wheel of diameter 60 mm having four spokes OA, OB, OC and OD rolls on a horizontal ground without slipping. The spoke OA is horizontal in its initial position with A to the left of O. After some moment once again, OA becomes horizontal with A to the right of O. Draw the path traced out by the point B which is initially at the top of wheel when it starts rolling.

[05]

c) A link 100 mm long, swings on a pivot O from its vertical position of rest to the right through an angle 60° and return to its initial position at uniform velocity. During that period point P moving at uniform speed along the link from a point at a distance of 12 mm from O, reaches to the end of link. Trace the path of point P.

[05]

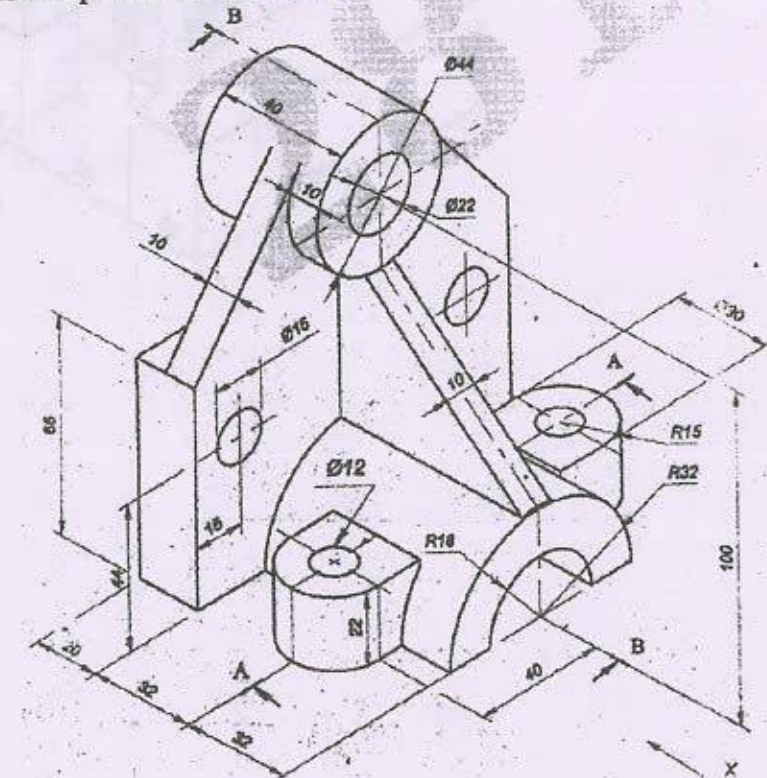
Q.5.

SECTION- II

[15]

From following figure draw the following views:

- Front view in the direction X.
- Sectional side view along plane B-B.
- Show important dimensions



Seat No.

QP Code: 6721QP
Total No. of Pages: 3

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71810_Engineering Mathematics_I_14.08.2023_10.30 AM To 01.00 PM
Subject Code: 71810

Day and Date: - Monday, 14-08-2023
Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

1) Figures to the right indicate full marks

Special Instruction.:

1) Attempt any three questions from each section. 2) Use of non-programmable calculator is allowed.

Q.1. Solve the following

[12]

SECTION-I

a) Reduce to Normal form and find the rank of matrix $\begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}$ [6]

b) Test for consistency and if possible, solve the equations [6]

$$2x - y + z = 9, \quad 3x - y + z = 6, \quad 4x - y + 2z = 7, \quad -x + y - z = 4$$

Q.2. Solve the following

[11]

a) Find Eigen values of the matrix $\begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -4 & -3 \end{bmatrix}$ [5]

b) Verify Cayley-Hamilton Theorem for the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ [6]

Q.3. Solve the following

[11]

a) Simplify $\left[\frac{1 + \cos\left(\frac{\pi}{9}\right) + i \sin\left(\frac{\pi}{9}\right)}{1 + \cos\left(\frac{\pi}{9}\right) - i \sin\left(\frac{\pi}{9}\right)} \right]^{18}$ [5]

b) Using De Moivre's Theorem Prove that [6]

$$\frac{\sin 6\theta}{\sin 2\theta} = 16\cos^4\theta - 16\cos^2\theta + 3$$

4. Solve the following

Attempt any two of the following.

a) Solve the following equations

$$x_1 + x_2 - x_3 + x_4 = 0, \quad x_1 - x_2 + 2x_3 - x_4 = 0, \quad 3x_1 + x_2 + x_4 = 0$$

b) Find the Eigen values and Eigen vector of the smallest Eigen value of the

$$\text{matrix} \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$$

c) Solve $x^3 = 1 + i$ and find the continued product of the roots.

5. Solve the following

SECTION-II

a) Use Gauss Elimination method to solve the equations

$$x + 3y - 2z = 5, \quad 2x + y - 3z = 1, \quad 3x + 2y - z = 6$$

b) Use Gauss-Seidel method to solve the equations

$$83x + 11y - 4z = 95, \quad 7x + 52y + 13z = 104, \quad 3x + 8y + 29z = 71$$

6. Solve the following

a) Evaluate $\lim_{x \rightarrow 0} \frac{e^{2x} - (1+x)^2}{x \log(1+x)}$

b) Expand $\sin\left(\frac{\pi}{6} + x\right)$ up to x^4 and find $\sin(30^\circ, 30')$

7. Solve the following

a) If $u = \frac{x+y}{1-xy}$, $v = \tan^{-1}x + \tan^{-1}y$ then find $\frac{\partial(u, v)}{\partial(x, y)}$

b) If $u = x^2 e^{\left(\frac{x}{y}\right)}$ then find i) $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$

$$\text{ii) } x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$$

[12]

8. Solve the following

[12]

Attempt any two of the following.

a) Apply Gauss-Jordan method to solve the equations

$$x + y + z = 5, \quad 2x + 3y + z = 10, \quad 3x - 2y + 2z = 3$$

b) Using Maclaurin's series prove that

$$\log \cos x = -\frac{x^2}{2} - \frac{x^4}{12} - \frac{x^6}{45} - \dots$$

c) Determine extreme values of the function $f(x, y) = x^2 + y^2 + 6x + 12$.

[12]

[6]

[6]

[11]

[5]

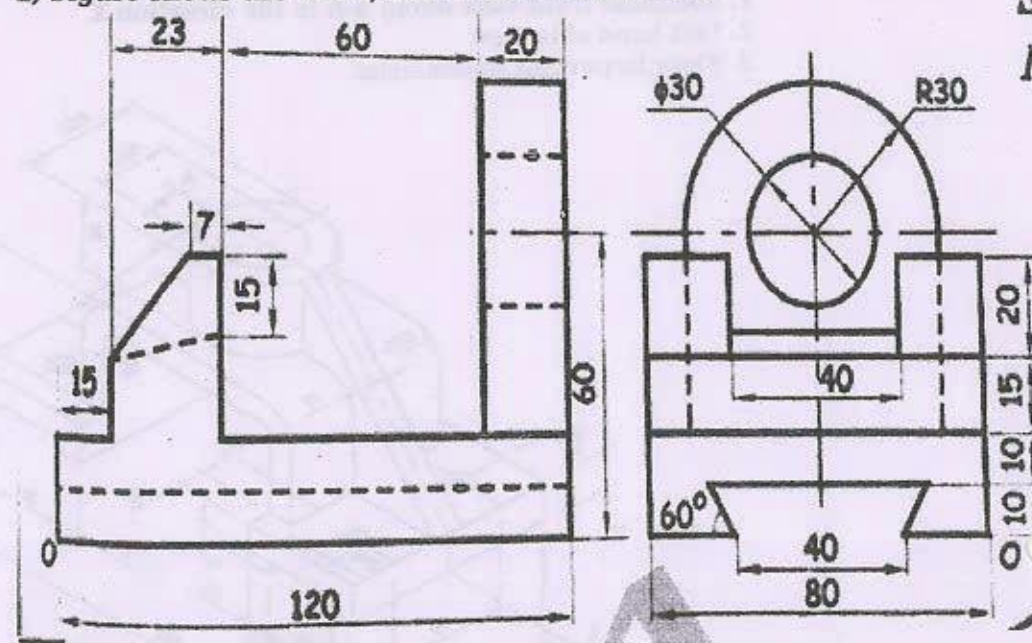
[6]

[11]

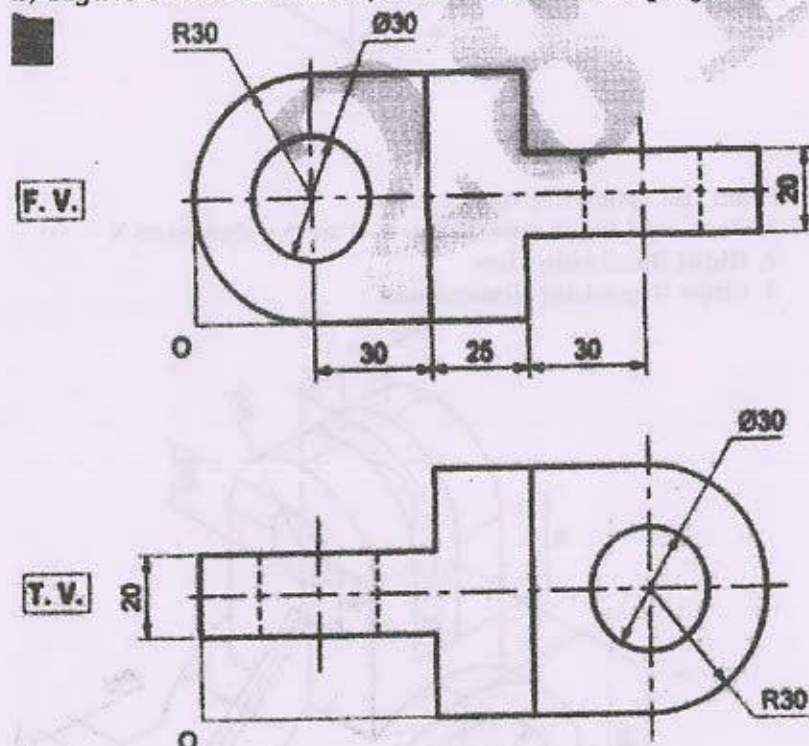
[5]

[6]

- Q.7. Solve any one
a) Figure shows the views, Draw its isometric view



- b) Figure shows the views, Draw its isometric projection



- Q.8. A square prism base 45 mm and 90 mm long axis, has its base on the ground and faces equally inclined to VP. It is cut by a plane inclined 60 degree to HP and passing through a point on axis 65 mm above the ground. Draw its F.V., sectional T.V. and develop the remaining part of prism after taking the section.

[10]

Seat No.

QP Code: 6657QP

Total No. of Pages: 5

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_71814_Engineering Graphics_09.08.2023_10.30 AM To 02.00 PM

Subject Code: 71814

Day and Date: - Wednesday, 09-08-2023

Time: - 10:30 am to 02:00 pm

Total Marks: 70

Instructions:

1) Figures to the right indicate full marks

Special Instruction:

1) Solve any one from Q. 1 and Q. 2. 2) Solve any one from Q. 5 and Q. 6. 3) Attempt remaining four questions compulsory. 4) Assume suitable data if necessary. 5) Use both sides of drawing paper. 6) All dimensions are in mm.

Q.1.

[15]

SECTION - I

a) Solve any one

i) Complete the projections of line AB if Grade is 75%, bearing is S45W and true length is 80 mm Ref. Fig [05]

FV

AF

X

Y

AH

TV

ii) Draw the FV and TV of a regular pentagon of 50 mm sides when the surface of the plane is kept on VP having one of its side perpendicular to HP.

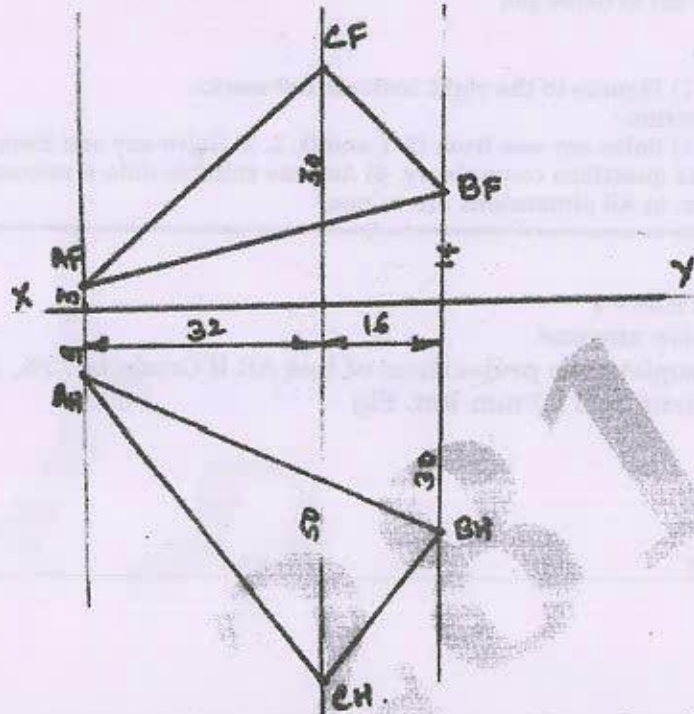
[05]

b) A pentagonal plate of side 30 mm has one of the sides in the VP and parallel to HP. The surface of the plate makes an angle of 30 degree with the VP. Draw its projections.

[10]

[10]

2. a) Solve any one
 i) The TV of 75 mm long line CD measures 50 mm. End C is in HP and 50 mm in front of VP. End D is 10 mm in front of VP and it is above HP. Draw the projections of CD and find angles with HP & VP [05]
 ii) Find the angle made by plane ABC with HP and its perimeter [05]



- b) A semi-circular disc plate of diameter 65 mm has its straight edge in the VP and inclined at 45 degree to HP. Draw its projections if the surface of the plate makes an angle of 30 degree with the VP. [10]

3. A square pyramid side of base 40 mm and axis height 60 mm has one of the side of base in the HP. The axis of solid is inclined to HP at an angle of 30 degree and top view of axis is inclined at an angle 45 degree with the VP. Draw its projections by keeping apex nearer to the observer. [10]

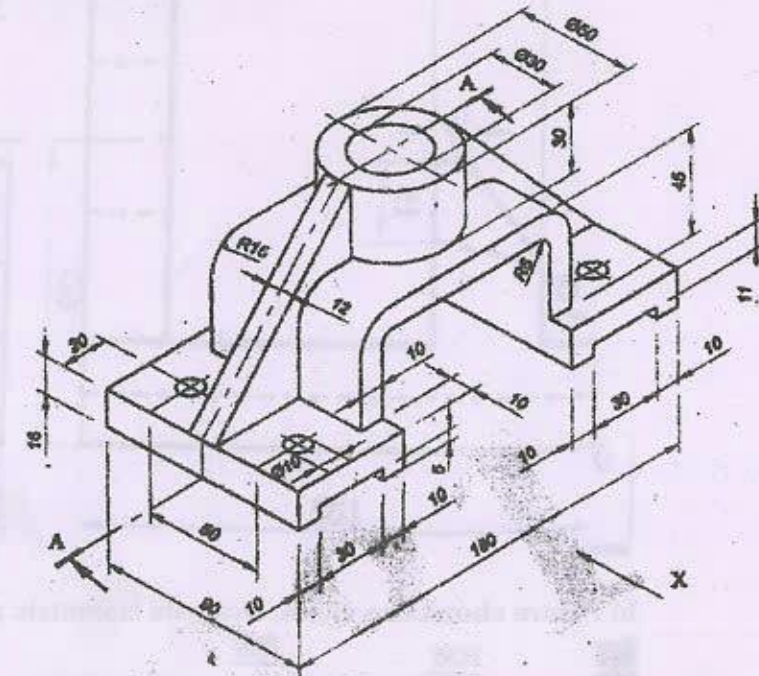
4. Solve any two
 a) Construct an ellipse when the length of major axis is 100 mm and the distance between foci is 64 mm. [05]
 b) Trace the path of point P for a circle of diameter 56 mm. The initial position of point P is at the top of wheel. Draw the cycloid for one complete revolution of a circle. [05]
 c) Draw the involute of a circle of 40 mm diameter. [05]

[15]

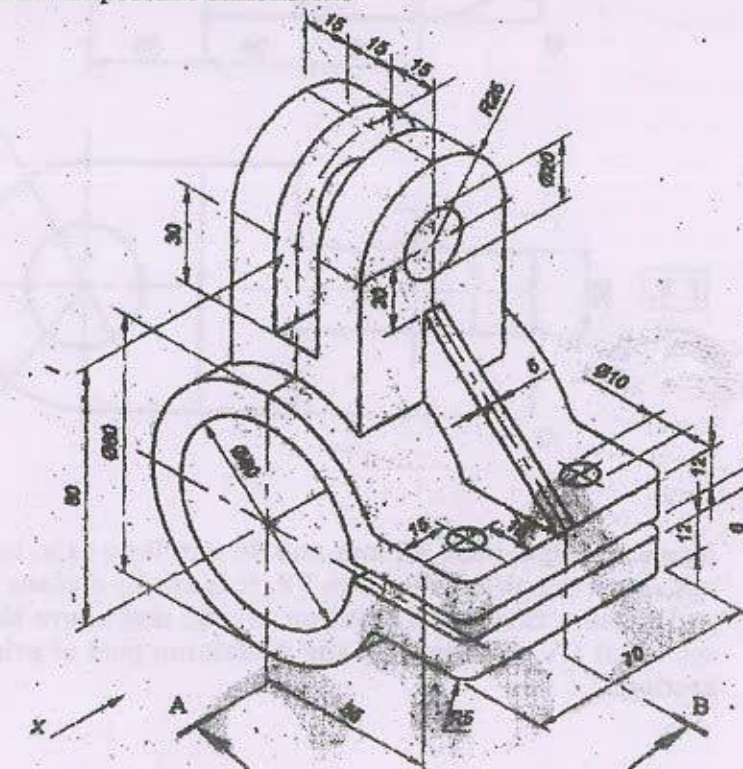
Q.5.

SECTION - II [15]

- From the following figure draw the views
 1. Sectional front view along A-A in the direction X
 2. Left hand side view
 3. Show important dimensions



- Q.6. From the following figure draw,
 1. Sectional front view along B-B in the direction X
 2. Right hand side view
 3. Show important dimensions



[15]

[10]