

Seat No. **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]

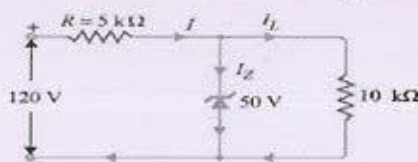
1. What is De- Multiplexer? Explain 1:8 De-mux with truth table
2. Write a short note on a) Weighing machine b) Digital Thermometer

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. **January - February (Winter) Examination - 2023**

Subject Name: B.Tech. CBCS_71813_Basic Civil Engineering_25.03.2023_10.30 AM To 01.00 PM

Subject Code: 71813

Day and Date: Saturday, 25-03-2023

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
- 4) Assume suitable data wherever necessary and mention it boldly

Special Instruction.:

1. Solve any three questions from Q.1 to Q 4 and any three questions from Q5 to Q8

-
- Q.1. a) Enlist various principles of building planning. Explain Aspect and prospect in details (6) [12]
b) What is meant by building bye laws? Write down specific bye laws for F.S.I. (6)
- Q.2. a) Explain with neat sketch different elements of substructure (5) [11]
b) What is bearing capacity of soil? Which are the factors affecting bearing capacity of soil (6)
- Q.3. a) Explain in brief types of loads considered in the design of building (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 transportation engineering in details. (4)
b) Write a note on Well foundation. (4)
c) Write a note on 'Ready mix concrete'. (4)
d) Write a note on: Types of Concrete (4)
- Q.5. a) What do you mean by Surveying? Explain Principles of Surveying in brief (5) [11]
b) Explain following terms - a) Nominal Scale b) Representative fraction (RF) (6)
- Q.6. a) What are the temporary adjustments in Dumpy level? Explain with neat sketch (5) [12]
b) The following staff readings were observed successively with a level. The instrument has been shifted after the second and fifth reading: 0.675, 1.230, 0.750, 2.565, 2.225, 1.935, 1.835 and 3.220. The first reading was with staff held on benchmark of RL 100.000 m. Enter the readings in a page of level book and calculate the RL of all points. Apply arithmetic checks. Use collimation plane method (7)

- Q.7. a) Draw a typical cross-section of Road in cutting and embankment (5) [11]
b) What are the different types of Rail Gauges? Explain in brief (6)
- Q.8. Write any THREE short notes of the following [12]
a) Chaining and ranging process (4)
b) Conversion of Whole circle bearing into reduced bearing (4)
c) Use of Electronic distance measurement (EDM) (4)
d) Gravity Dam (4)

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Seat No. **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		[12]
			6	
	ii)	Explain Boy's calorimeter with neat labeled diagram.		6
			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: 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.

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 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)

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

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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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. | <p>a) Define thermodynamic state, thermodynamic process and thermodynamic cycle. (6)</p> <p>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)</p> | <p style="text-align: center;">SECTION I</p> <p>[12]</p> |
| Q.2. | <p>a) Compare C. I Engine with S. I Engine (6)</p> <p>b) Represent Joule cycle on P-V diagram and obtain expression of air standard efficiency (6)</p> | [12] |
| Q.3. | <p>a) Explain working of vapour absorption refrigeration system (6)</p> <p>b) Define the following terms (5)</p> <ol style="list-style-type: none"> 1. Dry air 2. Moist air 3. Saturated air 4. Degree of saturation 5. Specific Humidity | [11] |
| Q.4. | <p>Write short notes: (12)</p> <ol style="list-style-type: none"> 1. Solar refrigeration system. 2. Assumption in air standard cycles. 3. PMM-I and PMM-II. | [12] |
| Q.5. | <p style="text-align: center;">SECTION II</p> <p>a) Draw a layout of hydroelectric power plant and explain its working (6)</p> <p>b) What is Biodiesel? State its advantages and limitations (6)</p> | [12] |
| Q.6. | <p>a) Explain reciprocating air compressor with Neat Sketch (5)</p> <p>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)</p> | [12] |
| Q.7. | <p>a) Explain Metal removing Processes in detail (5)</p> <p>b) Explain any two Metal Joining process (6)</p> | [11] |

- | | | |
|------|--|------|
| Q.8. | <p>a) Compare belt, chain and gear drive (5)</p> <p>b) Explain with neat sketch the parabolic collectors (6)</p> | [11] |
|------|--|------|

Seat No. **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]

4. Attempt any two of the following.

a) Solve the following equations

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

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

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

c) Using De Moivre's Theorem Prove that

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

Q.5.

SECTION-II

Solve the following.

a) Apply Gauss-Jordan method to solve the equations

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

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

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

Q.6. Solve the following

a) Using Maclaurin's series prove that

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

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

Q.7. Solve the following

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

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

Q.8. Attempt any two of the following.

a) Use Gauss-Seidel method to solve the equations

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

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

c) Determine extreme values of the function $f(x, y) = x^2 + y^2 - 3xy$.

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.:

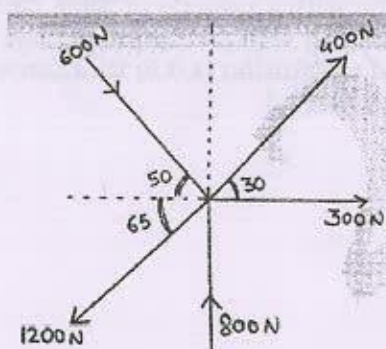
3. Attempt any three questions from each section 4. Use of non-programmable calculator is allowed.

Q.1.

SECTION -I

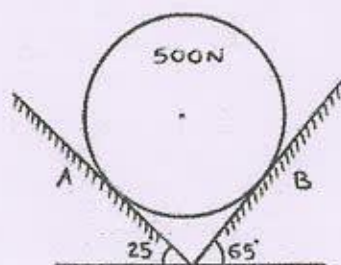
[11]

- 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)



Q.2.

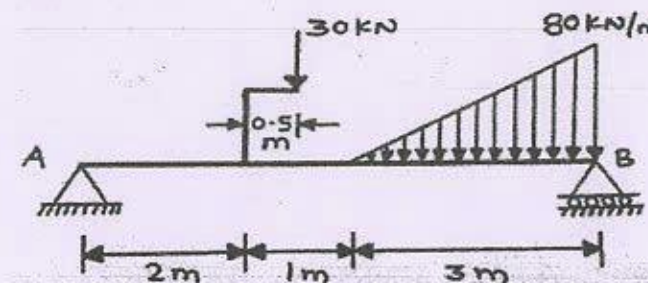
- a) State Lami's Theorem? (3 Marks)
- b) Find the reaction at point of contact A & B for the sphere of weight 500N shown below? (9 Marks)



Q.3.

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

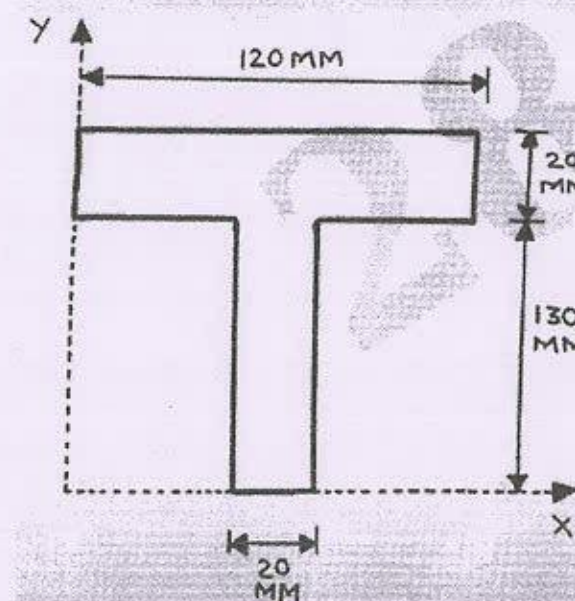
[11]



Q.4.

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

[12]



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

- 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)

- [illegible]

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

Subject Code: 71814

Time: 10:30 am to 02:00 pm

Total Marks: 70

1) Figures to the right indicate full marks

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.

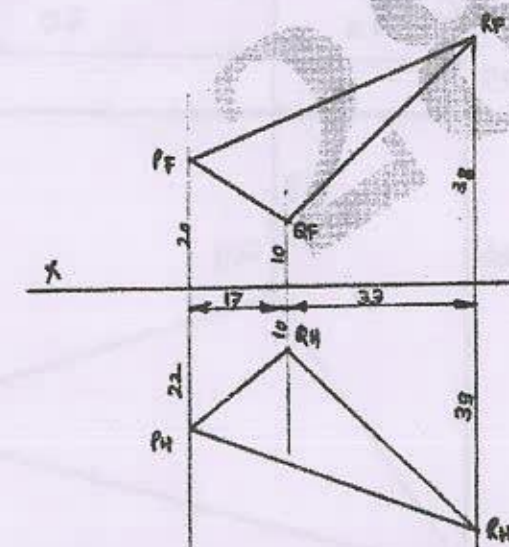
SECTION- I

[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

[05]

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

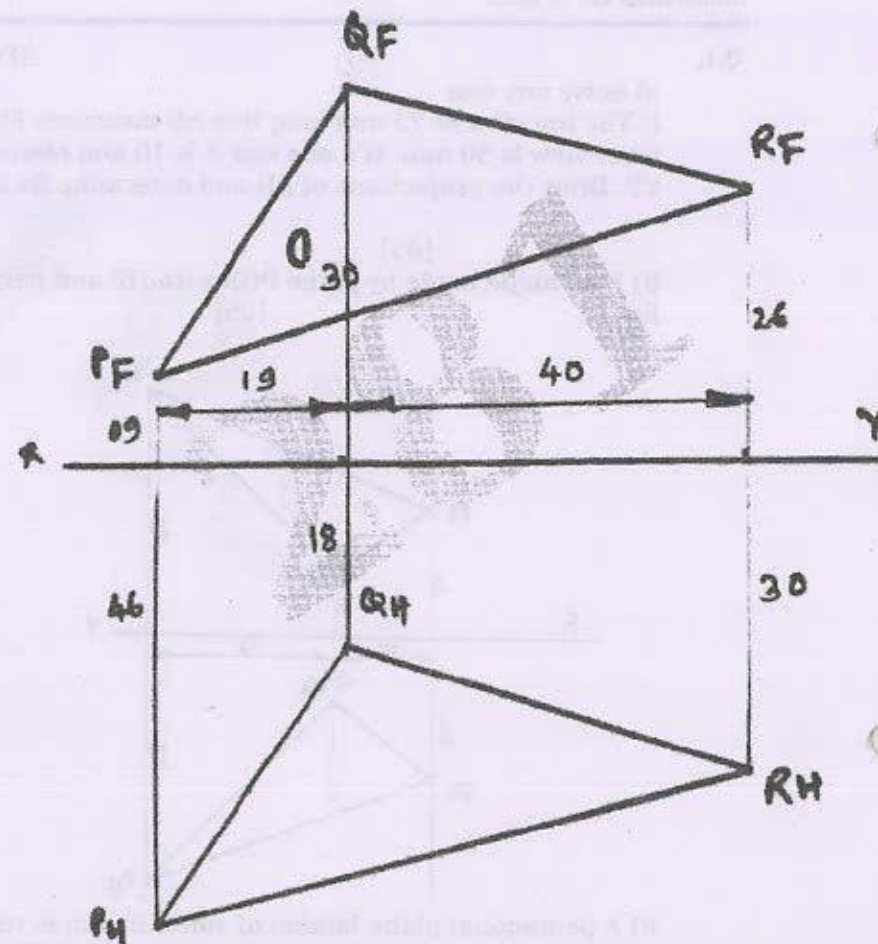
i) Line AB is 75 mm long. Its FV and TV measures 50 mm and 60 mm. End A is 10 mm above HP and 15 mm Infront of VP. Draw projections of line AB and find angles with HP and VP

[15]

[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.

[10]

[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:

i) Front view in the direction X.

ii) Sectional side view along plane B-B.

iii) Show important dimensions

