MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, July/August 2021
Computer Programming with C
(ME, ECE, CSE, IT & AE)

Roll No

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Discuss about the following operators in C language with example.

   i. Bitwise operators   **[5M]**

   ii. Increment and decrement operators   **[5M]**

   iii. Logical operators   **[5M]**

2   Discover the different looping constructs in C language and explain it.   **[15M]**

3   Classify the various functions and explain with neat examples.   **[15M]**

4   a) Identify and demonstrate various storage classes which can be used with   **[10M]**
        functions.

     b) Outline the pre-processor commands.   **[5M]**

5   Explain with suitable example how to declare and initialize 1D and multi-   **[15M]**
     dimensional array.

6   List out the string library functions. Explain any 4 functions with syntax and   **[15M]**
      example.

7   Develop a C program to read and display multiple strings using pointers.   **[15M]**

8   Write a C program that defines a structure **employee** containing the details such as   **[15M]**
     empno, empname, department name and salary. The structure has to store 20
     employees in an organization. Use the appropriate method to define the above
     details and define a function that will display the contents?

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R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, July/August 2021
Engineering Physics-I
(ME, ECE, CSE, IT & AE)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Describe the Newton's ring method for measuring the wavelength of **[15M]** monochromatic light. Give the necessary theory.

2   a) Explain Brewster's law. Based on Brewster's law show that when light is **[12M]** incident on the transparent substance at polarising angle, the reflected and refracted rays are right angles.
    b) When light is incident at an angle of 60^0 on a transparent material surface, **[3M]** the reflected light is completely polarised. Find the refractive index of the material of the surface and angle of refraction.

3   Explain the principle, construction and working of He – Ne laser with help of **[15M]** Energy Level Diagram.

4   Explain the classification of optical fibers as step index and graded index fibers in **[15M]** detailed manner.

5   Apply Schrodinger wave equation to the case of a particle in a one dimensional **[15M]** potential box and show that the energies of the particle are quantized.

6   a) State Debroglie hypothesis of matter waves. Derive the expression for **[12M]** matter waves.
    b) Calculate the velocity and kinetic energy of an electron of wave length **[3M]** 1.66×10^{-10} m.

7   a) Classify solids as conductors, semiconductors and insulators based on bandgap. **[5M]**
    b) Derive an expression for effective mass of an electron. **[10M]**

8   Explain the principle, construction and working of LED with necessary diagrams. **[15M]**
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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, July/August 2021
Mathematics-I
(ME, ECE, CSE, IT & AE)

Roll No									

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1. a) Test for the consistency and hence solve the system.
$x + y + z = 6, x - y + 2z = 5, 3x + y + z = 8, 2x - 2y + 3z = 7$ **[8M]**

   b) Verify Cayley-Hamilton theorem for $= \begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$, hence find A^{-1}. **[7M]**

2. Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.   **[15M]**

3. a) Prove that $u = x + y + z, v = xy + yz + zx, w = x^2 + y^2 + z^2$ are functional dependent and find the relation between them. **[8M]**

   b) If $x = u(1 - v); y = uv$ prove that $\frac{\partial(u,v)}{\partial(x,y)} \times \frac{\partial(x,y)}{\partial(u,v)} = 1$.   **[7M]**

4. Find the volume of the largest rectangular parallelepiped that can be inscribed in ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$. **[15M]**

5. a) Find the orthogonal Trajectory of the family of $r = a(1 - cos\theta)$ where "a" is parameter.**[7M]**
   b) Solve $y(1 + xy)dx + x(1 - xy)dy = 0$.   **[8M]**

6. a) Solve $(1 + y^2)dx = (tan^{-1}y - x)dy$ **[8M]**
   b) Bacteria in a culture grow exponentially so that the initial number has doubled in 3 hours. How many times, the initial number will be present after 9 hours. **[7M]**

7. a) Solve $(D^2 - 2D + 1)y = e^{3x}x^2 - sin2x + 3$. **[7M]**

   b) Apply the method of variation of parameters to solve $\frac{d^2y}{dx^2} + 4y = Sec2x$.   **[8M]**

8. Solve $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t, x(0) = 2, x'(0) = -1$ by using Laplace Transform. **[15M]**

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R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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I B.Tech I Semester Supplementary Examinations, July/August 2021
Engineering Chemistry
(ECE, CSE & IT)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Determine the P^H of an unknown solution using glass electrode.   **[15M]**

2   Write a brief note on construction, working and reactions involved in Hydrogen-   **[15M]**
      oxygen fuel cell.

3   Discuss the various factors effecting rate of corrosion.   **[15M]**

4   Explain cathodic protection of corrosion controlling method.   **[15M]**

5   Differentiate Thermoplastic & Thermosetting resins.   **[15M]**

6   Write in detail on characteristics of a good refractory and their applications.   **[15M]**

7   How hard water is softened by Zeolite process? Explain in detail with neat   **[15M]**
      diagram and suitable reactions.

8   Classify different types of fuels and write a note on Characteristics of a good fuel.   **[15M]**

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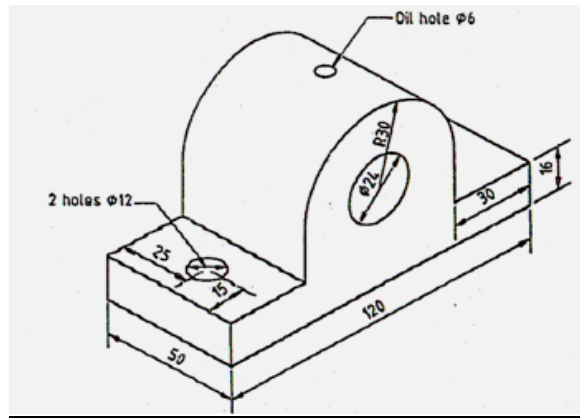### I B.Tech I Semester Supplementary Examinations, July/August 2021
Engineering Drawing
(ECE, CSE & IT)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	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	**[15M]**
2	Draw a epicycloid of a circle of 40 mm diameter which rolls outside another circle of 200 mm diameter for one revolution. Draw a tangent and normal at any point on it	**[15M]**
3	(i)A point B is 45mm above HP and 60mm behind VP draw its projections	**[5M]**
	(ii)A point D is 45 mm below HP and 60mm in front of VP. Draw its projections	**[5M]**
	(iii)A point A is 30mm above HP and 45mm in front of VP. Draw its front view and top view	**[5M]**
4	A line CD measuring 80mm is inclined at an angle of 30^0 to HP and 45^0 to VP. The point C is 20mm above HP and 30mm in front of VP. Draw the projections of the straight line	**[15M]**
5	A pentagonal lamina of 40mm side. The plane stands on one of its sides on HP with its plane perpendicular to VP and 45^0 inclined to HP. Draw projections	**[15M]**
6	Draw the projections of Pentagonal pyramid ,side of base 30mm and height 60mm resting with its base on HP such that one of the edges of the base is perpendicular to VP.	**[15M]**
7	A right hexagonal prism of side of base 24mm and axis 56 mm long is lying on one of the corners of the base. Its axis is inclined at angle of 30^0 to HP. Draw the isometric projections of the solid	**[15M]**
8	Draw the front view, top view and right side view of the object of given below(All dimensions are in mm)	**[15M]**

Oil hole ⌀6

2 holes ⌀12

R30

⌀22

30

16

25

15

120

50

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R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, July/August 2021
Engineering Mechanics
(ME & AE)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Find the resultant of forces 2,√2,5,√3 and 2N that act an angular point of a regular   **[15M]**
     hexagon towards the other angular points taken in order

2   Determine the magnitude and direction of the resultant of the following set of   **[15M]**
     forces acting on a body
     i)200N inclined 30^0 with east towards north,
     ii) 250N towards the north,
     iii)300 N towards north west
     iv) 350N inclined at 40^0 with west towards south. What will be the equilibrant of
     the given force system?

3   Two blocks A and B are resting against a wall and the floor as shown in **fig1**. Find   **[15M]**
     the value of horizontal force P applied to the lower block that will hold the system
     in equilibrium co-efficient of frictions are 0.25 at the floor, 0.3 at the wall and 0.2
     between blocks.
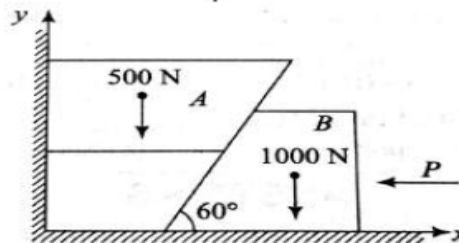

Fig:1

4   Two spheres each of 1000N and of radius 25cm rest in horizontal channel of width   **[15M]**
     90cm as shown in fig2. Find the reaction at the point of contact A,B and C.
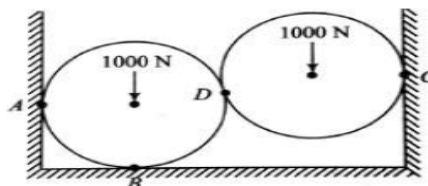

Fig:2

5   Determine the centroid of the semi-circle whose radius is R?   **[15M]**

6   Locate the centre of gravity of the area as shown in fig: 3 with respect to **[15M]**
     coordinate axes. All dimensions are in mm.
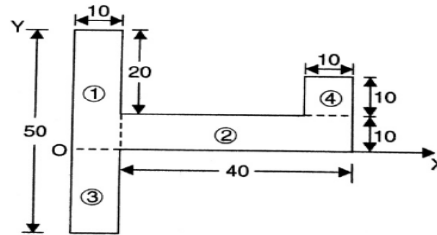

Fig:3

7   Determine the mass moment of inertia of cylinder shaft of 150mm and 2.5 mm of **[15M]**
     height above the centre of gravity axes (Density ρ=8000kg/m^3)

8   A lift carries a weight of 115N and is moving with a uniform acceleration of 3 **[15M]**
     m/s^2. Determine the tension in the cables supporting the lift, when
     i) lift is moving upwards and
     ii) Lift is moving downwards. Take g=9.80m/s^2
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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, July/August 2021
Environmental Studies
(ME & AE)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1a	Explain the Carbon cycle with a neat sketch.	**[7M]**
b	What are the biotic and abiotic components of eco-system? Discuss the types of food chains in eco-system.	**[8M]**
2	Discuss the following i) Scope and importance of ecosystem	**[5M]**
	ii) Flow of energy	**[5M]**
	iii) Carrying Capacity	**[5M]**
3a	Discuss the various natural resources of environment.	**[5M]**
b	How deforestation leads to climate change in environment?	**[10M]**
4	How alternate energy sources meeting the requirements of people? Explain with one example.	**[15M]**
5a	Define bio-diversity. Explain the types and values of bio-diversity	**[10M]**
b	Differentiate in-situ and ex-situ conservation of biodiversity	**[5M]**
6	Write notes on i) Habitat loss	**[5M]**
	ii) Poaching of wildlife	**[5M]**
	iii) man-wildlife conflicts	**[5M]**
7 a	Explain the Causes, effects and control measures of air pollution	**[8M]**
b	Write a detailed note on Solid waste management in India.	**[7M]**
8	Describe the following i) Concept of Sustainable Development	**[5M]**
	ii) Population and its explosion	**[5M]**
	iii) Environmental Education	**[5M]**

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