R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Computer Programming with C
(ME, ECE, CSE, IT & AE)

Roll No										

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

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART-A (25 Marks)

1). a	Explain the rules of variables	**[2M]**
b	Distinguish between if and switch statements.	**[3M]**
c	What are the limitations of recursion.	**[2M]**
d	What is an array? Write syntax for I-D and 2-D array.	**[3M]**
e	Differentiate between gets() and scanf().	**[2M]**
f	What are the string output functions?	**[3M]**
g	What is the need of typedef command?	**[2M]**
h	Differentiate between union and structure.	**[3M]**
i	What is a Preprocessor and its importance in C?	**[2M]**
j	Define file? What are types of file.	**[3M]**

PART-B (50 MARKS)
SECTION-I

2	Write what are the different types of Operators of C-language.	**[10M]**

OR

3	What is flow chart? How to represent flow chart?Draw the flow chart to find sum of N odd numbers.	**[10M]**

SECTION-II

4	Explain about various storage classes in C.	**[10M]**

OR

5	Explain the difference between user defined functions and standard library functions.	**[10M]**

SECTION-III

6	What is a String?Explain about String manipulation operations with examples.	**[10M]**

OR

7	Write a program to find wheather the given string is palindrome or not.	**[10M]**

SECTION-IV

8	Explain the following i. Pointer with arrays ii. Pointers	**[10M]**

OR

9	What are the advantages and disadvantages using pointers.	**[10M]**

SECTION-V

10 Differentiate between text files and binary files?   **[10M]**

OR

11 What are the different types of files are used in C   **[10M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Engineering Chemistry
(ECE, CSE & IT)

Roll No										

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

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions,
Choosing ONE Question from each SECTION and each Question carries 10 marks.
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PART-A (25 Marks)

1). a	What is meant by pH of a solution?	**[2M]**
b	What is conductometric titration of strong acid Vs strong base.	**[3M]**
c	What is galvanizing?	**[2M]**
d	How can corrosion be prevented?	**[3M]**
e	Define the term polymer with example	**[2M]**
f	Define addition polymerization and give an example	**[3M]**
g	Why is boiled water not always 100% safe for drinking purposes?	**[2M]**
h	What is Sedimentation with coagulation?	**[3M]**
i	Why are gaseous fuels more advantageous than solid fuels?	**[2M]**
j	Why a good fuel must have low ash content?	**[3M]**

PART-B (50 MARKS)
SECTION-I

2   Explain construction and working of Calomel electrode.   **[10M]**
OR
3   What do you mean by specific conductance, molar conductance and equivalent **[10M]**
conductance? What will be the effect of dilution be prevented?

SECTION-II

4   Define corrosion of metals. What are different types of corrosion? Explain the **[10M]**
electrochemical theory of wet corrosion and its mechanism.
OR
5   Explain the cathodic protection given to metals exposed to corrosion environment. **[10M]**
What are its draw backs?

SECTION-III

6   Describe the method of preparation, properties and applications of the following.
   i)   Phenol-formaldehyde resin   **[5M]**
   ii)   Teflon (PTFE)   **[5M]**
OR
7   What is Vulcanization of rubber? Mention its uses. Explain why natural rubber **[10M]**
needs Vulcanization

SECTION-IV

8   Differentiate between scale and sludge. How are scales formed? What are their **[10M]** disadvantages?

OR

9   What is the principle of reverse osmosis? What is the main advantage of reverse **[10M]** osmosis over ion-exchange process?

SECTION-V

10   What is meant by cracking of petroleum? Explain fixed-bed catalytic method of **[10M]** obtaining gasoline. Give its mechanism

OR

11   What is meant by calorific value of a fuel? Describe how the calorific value of a **[10M]** solid fuel is determined using Junker's calorimeter

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Engineering Drawing
(ECE, CSE & IT)

Roll No										

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

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions,
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SECTION-I

1a) Draw a regular pentagon inscribed in a circle of 80 mm diameter. **[7M]**

b) The vertex of a hyperbola is 65 mm from its focus. Draw the curve if the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve, 75 mm from the directrix. **[8M]**

OR

2a) Draw the locus of a point on the circumference of the circle diameter 50 mm which rolls on a straight line. **[7M]**

b Construct a plain scale of 1:5 to show decimeters and centimeters and to read up to 1 meter. Show the length of 7.6 dm on it. **[8M]**

SECTION-II

3 The top view of a line 75 mm long measures 65 mm, while its front view is 55 mm. Its one end 'A' is in H.P. & 12mm in front of V.P. Draw the projections of line AB and determine its inclination with HP & VP. **[15M]**

OR

4 Draw the projections of 70 mm long straight line AB, in the following positions: **[15M]**
i) Perpendicular to H.P., 20 mm in front of V.P. and its one end 15 mm above the HP.
ii) Perpendicular to V.P., parallel to and 30 mm above H.P.
iii) Inclined at 60^0 to the V.P. and its one end 15 mm in front of it; parallel to and 30 mm in front of the H.P.

SECTION-III

5a) Draw the projections of a circle of 50 mm diameter, having its plane vertical and inclined at 30^0 to the V.P. Its front view diameter is 45^0 to the HP. **[8M]**

b) A square lamina of side 35mm is parallel to HP with one of its sides is inclined at 30^0 to VP. The lamina is 20mm above HP. Draw its top and front views. **[7M]**

OR

6 A cone of base diameter 40 mm and axis height 60 mm rests on the ground on a point of its base circle such that the axis of the cone is inclined at 40^0 to the HP and 30^0 to the VP. Draw its front and top views. **[15M]**

SECTION-IV

7 Draw the isometric projection of a hexagonal pyramid side of base 40 mm and height 60 mm. **[15M]**
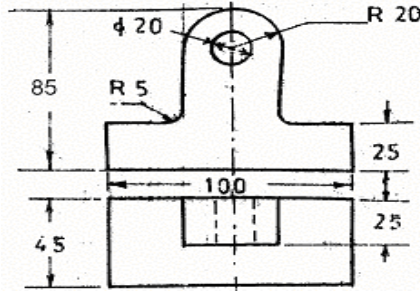
8 Draw an isometric projection of a pentagonal prism of base edges 30 mm and **[15M]** height 60 mm. The axis being vertical and one of the rectangular faces parallel to and in front of V.P. The helping figure is given below.
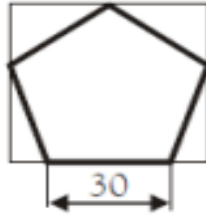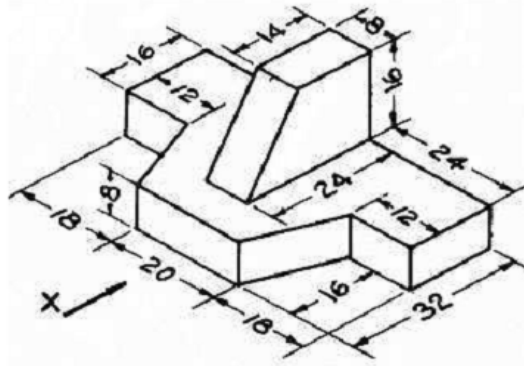

Helping figure

SECTION-V

9 The orthogonal views of the object are shown in Figure given below. Draw its **[15M]** isometric view.

OR

10 Draw the front view, top view and side view for the part shown in figure. **[15M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Engineering Mechanics
(ME & AE)

Roll No									

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

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions,
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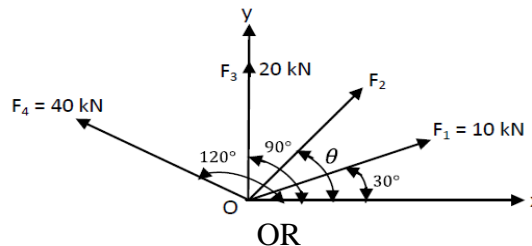*******

PART-A (25 Marks)

|		
1). a	Mention the characteristics of force and what is the S.I unit of force.	**[2M]**
b	State and explain briefly about the parallelogram law of forces.	**[3M]**
c	State limiting of friction with equation.	**[2M]**
d	What do you understand by space diagram and free-body diagram?	**[3M]**
e	Write two cases for the importance of centroid.	**[2M]**
f	Write the differences between centriod and centre of gravity.	**[3M]**
g	State the parallel axis theorem.	**[2M]**
h	Determine the mass moment of inertia of a slender rod of mass 2.5kg and the length 10m about an axis passing through its centroid and normal to its length.	**[3M]**
i	What do you mean by rectilinear motion and give examples.	**[2M]**
j	An automobile is decelerating from a speed of 65 km/h at the rate of 1.5 m/s^2. How long will it take to come to rest and how far will it have gone?	**[3M]**

PART-B (50 MARKS)
SECTION-I

2   The resultant of four forces which are acting at a point O as shown in figure below **[10M]** is along Y-axis. The magnitude of forces F1, F3 and F4 are 10 kN, 20 kN and 40 kN respectively. The angles made by 10 kN, 20 kN and 40 kN with X- axis are 30^0, 90^0 and 120^0 respectively. Find the magnitude and direction of force F2 if resultant is 72 kN.

OR

3   A uniform wheel of 600 mm diameter, weighing 5 kN rests against a rigid **[10M]** rectangular block of 150 mm height as shown in figure below. Find the least pull, through the centre of the wheel, required just to turn the wheel over the corner A of the block. Also find the reaction on the block. Take all the surfaces to be smooth.
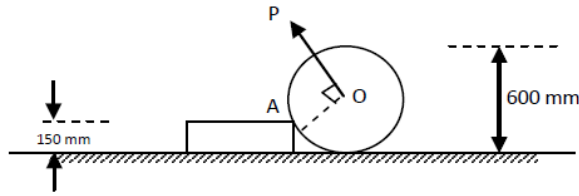
SECTION-II

4 Two rollers of the same diameter are supported by an inclined plane and a vertical **[10M]** wall as shown in figure. The upper and the lower rollers are respectively 200N and 250N in weight. Assuming smooth surfaces, find the reactions induced at the points of supports A, B, C and D.
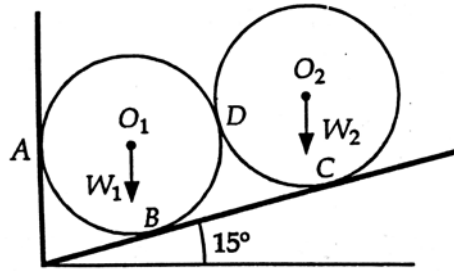
OR

5 a) State laws of friction **[5M]**
   b) explain the following
      (i)   Angle of friction (ii) Angle of repose (iii) Coefficient of friction **[5M]**
      (iv)   Cone angle (v) equilibrium conditions for anybody.

SECTION-III

6 Locate the centroid of the area shown in figure. All the dimensions are in mm. **[10M]**
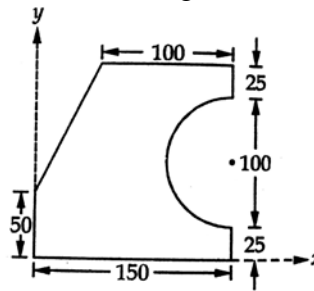
OR

7 Determine the centriod of quarter circle of radius 'R' . **[10M]**

SECTION-IV

8 Determine the moment of inertia of the shaded area as shown in figure with **[10M]** respect to horizontal centroidal axis.

<div align="center">OR</div>

9   Derive the mass moment of inertia of the solid cone of height h and base radius R about its axis of rotation.   **[10M]**

<div align="center">**SECTION-V**</div>

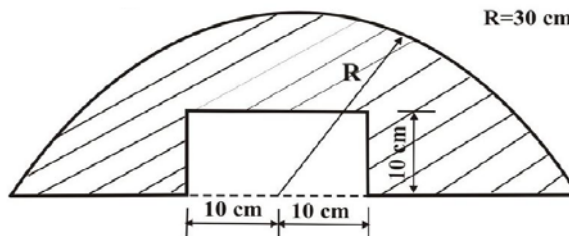10   The equation of motion of a particle moving in a straight line is given by $S = 18t + 3t^2 - 2t^3$ where S is the total distance covered from the starting point in meters at the end of t seconds. Find: **[10M]**
(i) The velocity and acceleration at start.
(ii) The time, when the particle reaches its maximum velocity.
(iii) The maximum velocity of the particle.

<div align="center">OR</div>

11   A motorist is travelling at 90 kmph, when he observes a traffic light 250m ahead of him turns red. The traffic light is timed to stay red for 12 sec. If the motorist wishes to pass the light without stopping, just as it turns green. Determine   **[10M]**

i) The required uniform deceleration of motor and

ii) The speed of the motor as it passes the traffic light

<div align="center">******</div>

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Engineering Physics - I
(ME, ECE, CSE, IT & AE)

Roll No										

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

Note: This question paper contains two parts A and B
   Part A is compulsory which carriers 25 marks and Answer all questions.
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PART-A (25 Marks)

1).	a	Differentiate between interference and diffraction in light.	**[2M]**
	b	What are the different polarizations seen in light with neat diagram in comparison to un polarized light	**[3M]**
	c	What are the characteristics of LASER light	**[2M]**
	d	Explain the principle of communication in optical fibers and explain the conditions to achieve the same.	**[3M]**
	e	Find the ratio of de-Broglie wave lengths associated with the electron and proton accelerated by same potential.	**[2M]**
	f	In a 1D box of length 'L' find the probability of finding the electron at L/3 distance from one end, when the particle is in ground state and when it is in 1st exited state.	**[3M]**
	g	What are the Inadequacies in free electron theory of metals?	**[2M]**
	h	Classify solids on the basis of their electrical conductivity with neat diagrams.	**[3M]**
	i	Give the conditions under which the Fermi level lies at the centre of band gap for an intrinsic semiconductor.	**[2M]**
	j	Explain the terms half wave and full wave rectifiers.	**[3M]**

PART-B (50 MARKS)
SECTION-I

2	a)	Explain Brewster's law of polarization.	**[5M]**
	b)	With a neat diagram explain the formation of Newton's rings and deduce expressions for n^{th} bright fringe, dark fringe and expression to find the wavelength of the monochromatic light given.	**[5M]**

OR

3		Give the Intensity expression for the diffraction of light from single slit and comment on the intensity variation with the order of diffraction.	**[10M]**

SECTION-II

4	a)	Explain what is lasing action and how are LASERs used in defence.	**[5M]**
	b)	Explain the construction and working of He-Ne LASER.	**[5M]**

OR

5	a)	Explain attenuation, Numerical aperture, acceptance angle in Optical	**[5M]**

fibers. **[5M]**

    b) What are the applications of optical fibers in sensors?

SECTION-III

6   a) What are matter waves and explain the properties of matter waves. **[5M]**

    b) Deduce expression for the wave function for a particle in 1D infinite potential box **[5M]**

OR

7   a) Explain Davison and Germer experiment to verify the wave nature of light. **[7M]**

    b) Explain the physical significance of wave function associated with quantum mechanical particle. **[3M]**

SECTION-IV

8   a) Explain the terms i) statistical distribution ii) Micro canonical ensemble iii) macro canonical ensemble with examples. **[5M]**

    b) What are the salient features of Kronig-Penny model? **[5M]**

OR

9   a) Distinguish in detail about the three statistical distribution functions and give examples of the particles that follow them. **[5M]**

    b) Explain the concept of effective mass and deduce an expression for the same for the quantum mechanical particle in terms of E,k. **[5M]**

SECTION-V

10   a) Derive an expression for carrier concentration of holes in a 'p' type semiconductor. **[5M]**

    b) Explain the formation of a PN-junction diode and show its IV-characteristics. **[5M]**

OR

11   a) What is Hall-Effect and deduce an expression for hall coefficient of a semiconductor. **[5M]**

    b) Explain the working of LED and solar cell using a PN-junction diode. **[5M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, December 2019
Mathematics-I
(ME, ECE, CSE, IT & AE)

Roll No									

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

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PART-A (25 Marks)

1). a Define rank of a Matrix.   **[2M]**

   b If $A = \begin{bmatrix} 1 & 2 & -3 \\ 0 & 3 & 2 \\ 0 & 0 & -2 \end{bmatrix}$, then find the eigen values of a matrix $3A^2 - 2I$ **[3M]**

   c Verify Rolle's theorem for the function $f(x) = \frac{1}{x^2}$ $in [-1, 1]$.   **[2M]**

   d Define Jacobian of u(x,y) and v(x,y).   **[3M]**

   e Form the differential equation by eliminating the arbitrary constants A and B from   **[2M]**
      $y = Ae^{-2x} + Be^{5x}$

   f State Law of Natural Decay.   **[3M]**

   g Solve $D^3y-y=0$ **[2M]**

   h Solve $(D^2 +5D+6)y = e^{-2x}$ **[3M]**

   i Find Laplace Transform of $(Sint+Cost)^2$ **[2M]**

   j State convolution theorem   **[3M]**

PART-B (50 MARKS)
SECTION-I

2   **[5M]**

   (a).Find the rank of A = $\begin{bmatrix} 1 & 2 & -1 & 2 \\ 2 & 2 & -1 & 1 \\ -1 & -1 & 1 & -1 \\ 2 & 1 & -1 & 2 \end{bmatrix}$ using Echelon form.

   (b). Discuss for what values of α, β the equations

                                                                               [5M]

   $x + y + z = 6$; $x + 2y + 3z = 10$; $x + 2y + \alpha z = \beta$ have (i) No
   solution (ii) Unique solution (iii) an infinite solutions

                                OR

3   **[10M]**
   Find Eigen values and Eigen vectors of matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$.

SECTION-II

4 a. State Rolle's, Langranges's and Cauchy's theorem **[5M]**
   b. Obtain the Maclaurin series expansion of the function $log(1 + x)$. **[5M]**

OR

5 a). Verify Cauchy mean value theorem for $f(x) = sinx$; $g(x) = cos\ x$ in $[\ 0,\ \pi/2\ ]$ **[4M]**

   b). A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. **[6M]**

SECTION-III

6 a).Solve $(1 + y^2)dx = (Tan^{-1}y - x)dy$. **[5M]**
   b).The number N of bacteria in a culture grew at a rate proportional to M. The value of N was initially 100 and increased to 332 in one hour. What was the value of N after 3/2 hours? **[5M]**

OR

7 a).Prove that system of parabolas $y^2 = 4a(x+a)$ is self Orthogonal. **[5M]**
   b).A body is originally at 80° C and cools down to 60° C in 20 minutes. If the temperature of the air is 40° C, find the temperature of the body after 40 minutes. **[5M]**

SECTION-IV

8 Solve $(D^2 + 3D+2)y = xe^x\ Sinx$ **[10M]**

OR

9 Apply the method of variation of parameters to solve $(D^2 + 4\ )y = Sec(2x)$ **[10M]**

SECTION-V

10 a) Find $L\left[\dfrac{e^{-3t}\ sin\ 2t}{t}\right]$ **[5M]**

    b) Find $L\{e^{-t}\ sin4t\}$ **[5M]**

OR

11 Solve the differential equation using Laplace transform **[10M]**
    $\dfrac{d^2x}{dt^2} - 4\dfrac{dx}{dt} - 12x = e^{3t}$, $x(0) = 1, x'(0) = -2$.

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