

Code No: R17A0013

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, February 2021**Engineering Chemistry****(EEE, ECE, CSE & IT)**

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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a) What is Conductometric titration? How do you know the concentration of unknown strong acid using known strong base by conductometric titration? [10M]
[4M]
- b) Calculate the equivalent and specific conductance of 0.01N KCl solution which is offering a resistance of 400 ohms at 25°C. The cell constant of conductivity cell used is 0.99cm⁻¹. [4M]
- 2 a) Determine the P^H of unknown solution by using Glass electrode. [7M]
- b) Write the construction and working of Lead–acid battery with neat diagram and chemical equations. [7M]
- 3 a) Define Corrosion. Write a note on causes and effects of corrosion. [7M]
- b) Write in brief factors effecting the rate of corrosion. [7M]
- 4 a) Discuss the various types of hot dipping method of metal coatings with neat diagram. [7M]
- b) Write the procedure involved in electroless plating of Ni and write its advantages and applications. [7M]
- 5 a) Write the differences between thermoplastic and thermosetting resins. [7M]
- b) Explain the preparation, properties and uses of the Nylon-6, 6. [7M]
- 6 a) Explain the preparation, properties and uses of the Buna-S rubber. [7M]
- b) Write a detailed note on application of Nano materials. [7M]
- 7 a) Discuss the Ion exchange process for the removal of dissolved impurities. [10M]
- b) What are the specifications of potable water? How is it sterilized by chlorination [4M]
- 8 a) Explain in detail Ultimate analysis of coal and its significance. [10M]
- b) Write a short note on Octane number. [4M]

Code No: **R17A0302****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

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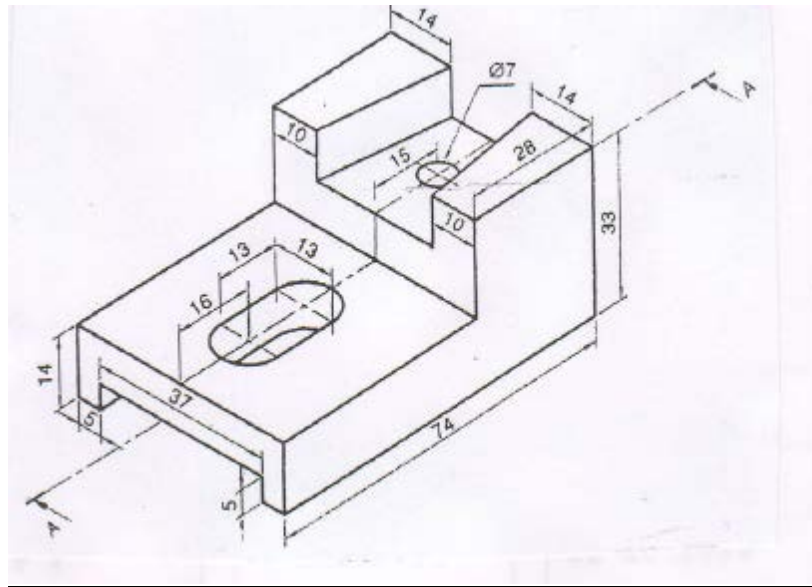
I B.Tech I Semester Supplementary Examinations, February 2021**Engineering Drawing****(EEE, ECE, CSE, IT)**

Roll No									
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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 Construct a parabola when the distance between focus and the directrix is 40mm. [14M]
Draw tangent and normal at any point P on your curve.
- 2 Draw an epicycloid of rolling circle 40mm, which rolls out side another circle of 150mm diameter for one revolution. Draw a tangent and normal at any point on the curve. [14M]
- 3 Draw the projections of the following points on a common reference line [14M]
 - (i) 35mm above HP and 25mm in front of VP.
 - (ii) 40mm below HP and 15mm behind VP.
 - (iii) 50mm above HP and 25mm behind VP.
 - (iv) 45mm below HP and 25mm behind VP.
- 4 A line AB 120mm long is inclined 45° to HP and 30° to VP. Its mid- point C is in VP and 20mm above HP. The end A is in third quadrant and B is in first quadrant. Draw the projections of the line. [14M]
- 5 A thin cylinder metal plate of 48mm diameter, having its plane vertical and inclined at 40° to VP. Its centre is 33 mm above HP and 25 mm in front of VP. Draw its projections and locate its traces. [14M]
- 6 A pentagonal prism, side of base 25 mm and axis 50 mm long, rests with one of its edges on HP such that the base containing that edge makes an angle of 30° to HP and its axis is parallel to VP. Draw its projections. [14M]
- 7 A cylinder disc of 20 mm diameter and altitude 20 mm is placed vertically at the center of the rectangular face of a hexagonal prism of 28 mm sides and axis 60 mm. Draw the isometric projection of the combination. [14M]
- 8 Draw the sectional front view, top view and side view of a given object [14M]



Code No: R17A0301

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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I B.Tech I Semester Supplementary Examinations, February 2021

Engineering Mechanics

(ME & AE)

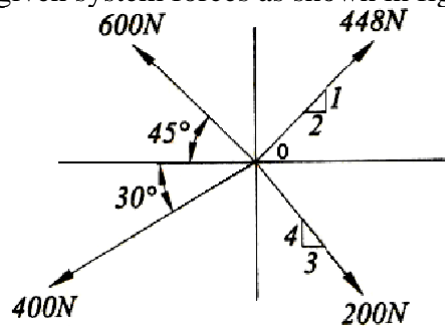
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Time: 2 hours 30 min

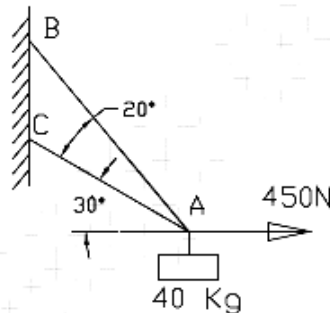
Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

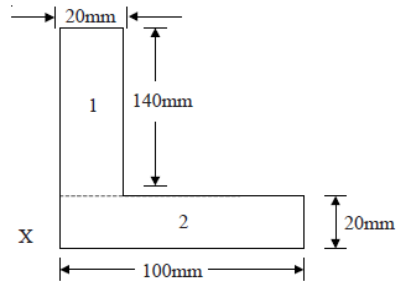
- 1 a) What is couple? Explain with neat diagram [2M]
 b) Find the resultant of given system forces as shown in figure. [12M]



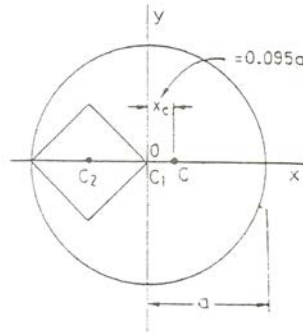
- 2 a) Find the resultant of the two forces whose magnitudes are 20KN and 50 KN acting an angle of 60° with each other, using Law of parallelogram of forces. [10M]
 b) Define moment of forces and define Varignon's theorem. [4M]
- 3 a) Differentiate between equilibrium and resultant [4M]
 b) Determine tension in cables AB and AC to hold 40kg load shown in figure. [10M]



- 4 a) Define angle of repose and coefficient of friction. [2M]
 b) A block overlaying a 10° wedge on a horizontal floor and leaning against a vertical wall and weighing 15 kN is to be raised by applying a horizontal force to wedge. Assuming the coefficient of friction between all the surfaces in contact to be 0.3, determine the minimum horizontal force, to be applied to rise the block. [12M]
- 5 a) Derive an expression for center of gravity in the case of solid right circular cone [7M]
 b) Find the centroid of section shown below [7M]



- 6 A square hole is punched out of a circular lamina as shown in the figure. The diagonal of the square which is punched out is equal to the radius of circle. Find the centroid of remaining lamina. [14M]



- 7 a. State the theorem of parallel axis and prove the same. [7M]
 b. For a uniform thin square plate of mass m , determine its mass moment of inertia about the y axis, which passes through its gravitational center G . [7M]
- 8 Define v_x and v_y of rectangular components in curvilinear motion. [14M]
 A motorist is travelling on a curved road of radius 200 m at a speed of 72 km/hr. Find the normal and tangential components of acceleration. If he applies brakes to slow down his car uniformly to a speed of 36 km/hr in 10 sec find the normal and tangential components of deceleration just after the brakes are applied.

Code No: R17A0011

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, February 2021**Engineering Physics-I****(EEE, ME, ECE, CSE, IT & AE)**

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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a). Describe Newton's rings experiment to determine wave length of light. [10M]
b). Write a short note on coherent sources. [4M]
- 2 Explain with necessary theory , the Fraunhofer diffraction due to single slit [14M]
- 3 a). What are Einstein's coefficients? Derive the relation between them. [10M]
b). What do you understand by Population Inversion and Meta Stable State. [4M]
- 4 a). Derive Numerical aperture in terms of fractional difference in refractive indices. [10M]
b). Write any four applications of optical fibers. [4M]
- 5 a). Explain de-Broglie's hypothesis of matter waves. [4M]
b). Describe Davisson and Germer's experiment. [10M]
- 6 a). Derive an expression for time independent Schrodinger's wave equation. [10M]
b). Write about the physical significance of wave function. [4M]
- 7 a). Distinguish Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistical distributions. [10M]
b). Discuss Bloch theorem. [4M]
- 8 a). Distinguish between Direct and indirect band gap semiconductors. [6M]
b). Explain with neat diagram, the construction and working of Solar Cell. [8M]

Code No: R17A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, February 2021

Mathematics-I

(EEE, ME, ECE, CSE, IT & AE)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any Five Questions

All Questions carries equal marks.

- 1 Reduce the following matrix A in to normal form and hence find its rank [14M]

$$\text{rank} \begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$$

- 2 Find the Eigen values and the corresponding Eigen vector of the matrix [14M]

$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

- 3 Prove that $\frac{\pi}{6} + \frac{1}{5\sqrt{3}} < \sin^{-1}\left(\frac{3}{5}\right) < \frac{\pi}{6} + \frac{1}{8}$ [14M]

- 4 Prove that the functions $u=xy+yz+zx$, $v=x^2+y^2+z^2$, $w=x+y+z$ are functionally dependent and find the relation between them. [14M]

- 5 a) Solve $x \log x \frac{dy}{dx} + y = \log x$ [7M]

- b) Solve $y(2x^2y + e^x)dx = (e^x + y^3)dy$ [7M]

- 6 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. [14M]

- 7 a) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = xe^{3x} + \sin 2x$ [7M]

- b) Apply the method of variation of parameters, Solve $\frac{d^2y}{dx^2} + y = \tan x$ [7M]

- 8 State Green's Theorem and Verify Green's theorem for $\int (xy + y^2)dx + x^2dy$ where c is bounded by $y=x$ and $y=x^2$ [14M]

Code No: **R17A0501****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, February 2021**Computer Programming with C
(EEE, ME, ECE, CSE, IT & AE)**

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Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions
All Questions carries equal marks.

- 1** a) Sketch a neat diagram of digital computer organization and explain about its each unit. **[7M]**
- b) Build an algorithm and draw flowchart for finding greatest among three given numbers. **[7M]**
- 2** a) Why C language supports many data types? Predict the effect of mixing types in C. Explain briefly the numeric types supported by C. **[8M]**
- b) Write a program to check whether the given number is “Even” or “Odd”. **[6M]**
- 3** a) Write a function isprime(num) that accepts an integer argument and returns 1 if the argument is a prime or 0 otherwise. Write a program that invokes this function to generate prime numbers between the given ranges. **[9M]**
- b) Write short notes on nested functions. **[5M]**
- 4** a) Write a C program find the greatest common divisor (GCD) of two numbers using a recursive functions. **[8M]**
- b) How many types of storage classes do C supports? Identify the necessity of each **[6M]**
- 5** Write a C program to read N integers into an array A. Perform the following operations and display the results with appropriate headings. **[14M]**
- (i) sum of odd numbers,
(ii) sum of even numbers,
(iii) average of all numbers.
(iv) largest element in an array
(v) smallest element in an array
(vi) average of largest and smallest element.
- 6** a) Build a program to replace each constant in a string with the next one except letter „z“ „Z“ and „a“ „A“ . Thus the string “Programming in C is fun” should be modified as “Qsphsannjoh jo D jt gvo”. **[10M]**
- b) Write a C Program to implement string copy operation **[4M]**
STRCOPY(str1,str2)

- 7 a) Write a C program to swap two numbers using call by address (pointers or reference) method. [7M]
b) Relate array with pointers and illustrate with suitable examples. [7M]
- 8 a) Contrast an array with structures. [5M]
b) Write a program to read and display information [rollno, name, fees, DOB (dateofbirth)] of all students in the class. [9M]
