MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
Computer Programming with C
(EEE, ME, ECE, CSE, IT & AE)

Roll No										

Time: 2 hours   **Max. Marks: 70**

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

1   a) Draw a flowchart to compute compound interest for the given values.

b) State and explain various looping statements in c.

2   a) Explain about list of operators supported by C language.

b) Construct a C Program to find whether the given number is Armstrong or not.

3   Describe about types of functions and write pass by value mechanism with example.

4   Explain about various pre-processor directives in C with examples.

5   Brief about creation, storing and accessing of array elements in 1DA.

Prepare a C program to search an element in the array or not using binary search.

6   a) List and explain various string i/o functions with examples.

b) Write a C Program to check given string is palindrome or not

7   Describe the following with examples:

a) pointer arithmetic b) void pointer

8   State and explain the following keywords with an example:

a) enum b) typedef c) union

****

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
Engineering Chemistry
(EEE, ECE, CSE& IT)

Roll No										

Time: 2 hours   **Max. Marks: 70**

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

1   a)What is fuel Cell? Construct H_2-O_2 fuel cell. What are the disadvantages and applications of the cell?
b)What are ion selective electrodes? Write the working principle and application of glass electrode.

2   a)What is a concentration cell? Explain the working of an electrolyte concentration cell.
b)Explain the construction and functioning of Ni-Cd cell.

3   Define corrosion of metals. What are different types of corrosion? Explain the mechanism of electrochemical theory of wet corrosion.

4   a)What are the various factors affecting the rate of corrosion. Explain in brief.
b)Corrosion of water filled steel tanks occur below the waterline. Give reason

5   a) What are the various methods for the synthesis of fibre reinforced plastics? Write their applications.
b)What biodegradable polymers? Explain preparation and applications of polylactic acid.

6   a)Explain the classification, mechanism and applications of conducting polymers by taking polyacetylene as an example.
b)Write the structure of natural rubber. What are its disadvantages? Explain how this can be removed by vulcanization. What are the advantages of vulcanization of rubber?

7   What are the types of hardness? Explain the estimation of hardness of water by EDTA complexometric method.

8   a)What is cracking?Discuss the method of fixed bed catalytic cracking.
b)What is Octane number and Cetane number? What is their significance?

****

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
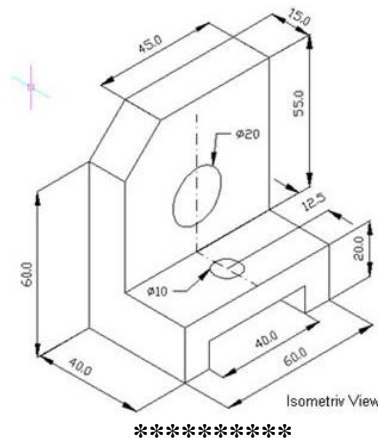**Engineering Drawing**
(EEE, ECE, CSE, IT)

Roll No										

Time: 2 hours   **Max. Marks: 70**

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

1   Draw an ellipse when the distance of its focus from its directrix is 50 mm and eccentricity is 2/3. Also draw a tangent and a normal to the ellipse at a point 70 mm away from the directrix.

2   If 1 cm long line on a map represents a real length of 4 m. Calculate the R.F. and draw a diagonal scale to measure up to 50 m. Show a distance of 44.5 m on it.

3   A straight line PQ has its end P 20 mm above HP and 30 mm in front of VP and the end Q is 80 mm above H.P. and 70 mm in front of the V.P. If the end projectors are 60 mm apart, Draw the projections of the line. Determine its true length and true inclinations with the reference planes.

4   An 80 mm long line AB is inclined at 30^0 to the H.P. and 45^0 to the V.P. The end A is 20mm above the H.P. and lying in the V.P. Draw the projections of the line.

5   A hexagonal plane of side 30mm has an edge on the H.P. Its surface is inclined at 45^0 to the H.P., and the edge on which the plane rests is inclined at 30^0 to the V.P. Draw its projections.

6   A pentagonal prism of base side 30mm and height 60mm rests on one of its base side on the H.P. inclined at 30^0 to the V.P. Its axis is inclined at 45^0 to the H.P. Draw its projections.

7   A hexagonal prism of base side 30mm and an axis 50mm has an axially drilled square hole of side 25mm. One of the faces of the square hole is parallel to a face of the hexagon. Draw the isometric projection.

8   Draw Front View, top view and side view for the part shown in figures. All dimensions are in mm.

Isometriv View

****

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
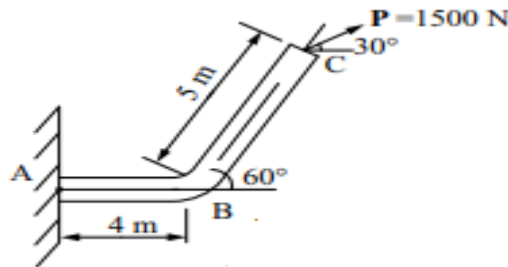### Engineering Mechanics
(ME & AE)

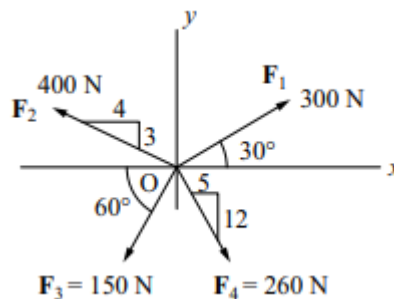| Roll No									

Time: 2 hours   **Max. Marks: 70**

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

**1**   State Principle of moments. Compute the moment 1500N shown figure about points A and B.


2   Determine the resultants of four forces shown below:

3   Determine the resultant of the system of concurrent forces having the following magnitudes passing through the origin and the indicated points: P = 300 N (+12, +6, −4), T = 500 N (−3, −4, +12) and F = 250 N (+6, −3, −6).

4   Find the least force P required to move the block in a wedge shown in following figure.
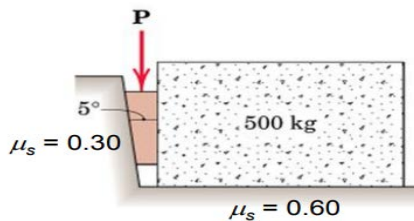
5   Derive expression to Locate the centroid of the triangle along height h from the base of length b.

6   Calculate Centroid of the geometry shown in Figure.
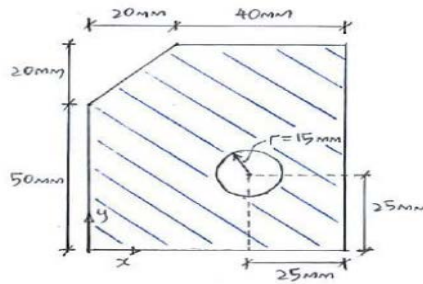
7 Consider a rectangle plane with base b and height h. Take origin of x-y-z coordinate system at CG and Derive the expressions for second moment of about both about X and Y axis and Polar moment of Inertia about Z axis is perpendicular to plane.

8 A car is driven along a straight track with position given by s(t) = 150t – 300 m (t in seconds). Find (a) velocity v(t) (b) acceleration a(t) and (c) the displacement and total distance travelled over the time interval [1, 4].

****

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
Engineering Physics-I
(EEE, ME, ECE, CSE, IT & AE)

Roll No										

Time: 2 hours **Max. Marks: 70**

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

1   Describe interference in thin films by reflected light and deduce the conditions for bright and dark fringes.

2   a) Describe Newton's rings experiment to determine wave length of light

b) Explain the theory of double refraction.

3   a) Describe the construction, principle and working of He - Ne laser.

b) What do you understand by Population inversion.

4   a) Derive an expression for numerical aperture of an optical fiber.

b) Write a brief note on different losses in optical fibers.

5   a) Derive time independent of Schrodinger's wave equation for a free particle.

b) Calculate the de Broglie wave length of neutron of energy 28.85 eV.

6   a) Show that the particle trapped in a potential box possesses discrete energy levels.

b) An electron is bound in one–dimensional infinite well of width 1×10^{-10} m. Find the energy value of an electron in the ground state and first two exited states.

7   a) Distinguish Maxwell, Boltzmann, Bose – Einstein, Fermi Dirac Statistical distributions

b) Distinguish between conductors, semiconductors and insulators on the basis of energy bands.

8   a) Derive an expression for Hall coefficient for a n - type semiconductors.

b) Write few applications of Hall effect.

****

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
Environmental Studies
(ME&AE)

Roll No										

Time: 2 hours   **Max. Marks: 70**

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

1   Explain various energy flow models with neat sketch?

2   Describe structural and functional characteristics of ecosystem?

3   Write about hydrological cycle with neat sketch and explain the impacts related to surface water resources?

4   Describe briefly any four renewable and four non renewable resources?

5   a. Define biodiversity and write about various levels of biodiversity?

    b. What is hotspot of biodiversity and explain various methods to conserve biodiversity?

6   Explain the values of biodiversity and threats to biodiversity?

7   Write about the classification, sources, effects and control methods of water pollution?

8   Briefly explain various laws to protect environment?
****

Code No: R17A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech I Semester Supplementary Examinations, October 2020
Mathematics-I
(EEE, ME, ECE, CSE, IT & AE)

Roll No										

Time: 2 hours   **Max. Marks: 70**

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

1 a) Reduce the matrix to normal form and hence find its rank

$$\begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$$

b) Investigate for what values of λ and μ the equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ have (i) No solution (ii) Unique solution (iii) An infinite number of solutions

2 a) Verify Cayley-Hamilton theorem for the following matrix and find its inverse

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

b) Find the eigen values and the eigen vectors of the matrix

$$\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$$

3 a) Verify Rolle's theorem for $f(x) = |x|$ in $[-1,1]$

b) Using Maclaurin's series, expand $Sin\ x$.

4 a) If $a < b$, prove that $\dfrac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \dfrac{b-a}{1+a^2}$ Using Lagranges mean value theorem deduce: $\dfrac{\pi}{4} + \dfrac{3}{25} < Tan^{-1}\dfrac{4}{3} < \dfrac{\pi}{4} + \dfrac{1}{6}$

b) Find the maximum and minimum values of $x^3 + y^3 - 3axy,\ \ where\ a > 0$

5 a) Define ordinary differential equation and solve the differential equation $\sec^2 x \tan y\ dx + \sec^2 y \tan x\ dy = 0$

b) Solve $(1 + y^2)dx = (\tan^{-1} y - x)dy$

6 a) The number N of bacteria in a culture grew at a rate proportional to N. The value of N was initially 100 and increased to 332 in one hour. What was the value of N after $1\dfrac{1}{2}$ hours

b)   Show that the family of parabolas $x^2 = 4a(y+a)$ is self orthogonal

7 a)   Solve $(D^2 + 4)y = e^x + \sin 2x$

b)   Solve $(D^2 - 4D + 4)y = 8x^2 e^{2x} \sin 2x.$

8 a)   Find *div* **F** and *curl* **F,** where $\mathbf{F} = grad\ (x^3+y^3+z^3-3xyz)$

b)   Show that $div(grad\ r^m) = m(m+1)r^{m-2}$, where $r = |\mathbf{r}|$, $\mathbf{r} = x\mathbf{i} + y\mathbf{j} + z\mathbf{k}$

****