Code No: R15A0501 **R15**

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

(ME, ECE, CSE, IT & AE)

Roll No										

Time: 2 hours **Max. Marks: 75**

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

1 a) Write the importance of basis data types and also write its memory sizes.
b) What are the main difference between 'while' and 'do-while' statements and also demonstrate both control statements.

2 Define flow chart? And draw a flow chart for finding whether the given number is Armstrong or not.

3 Write the difference between call by value and call by reference? And also write suitable programs of each.

4 Write a C program to swapping of two numbers using function.

5 Write a 'C' program for matrix multiplication.

6 What is meant by arrays of strings? When it will be used? Explain with a 'C' program

7 a) Explain any three types of pre-processor commands.
b) Explain about nested structures.

8 What operations can be performed on files? Explain

******

R15

Code No: R15A0013

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, October 2020

Engineering Chemistry

(ECE, CSE & IT)

Roll No										

Time: 2 hours **Max. Marks: 75**

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

1 How do you determine of pH using hydrogen electrode

2 Derive Nernst equation and give its applications.

3 Discuss the factors influencing corrosion.

4 a) Write in brief on impressed current method of cathodic protection.
b) Explain sacrificial anodic protection method of controlling corrosion.

5 i) Bring out the differences between thermoplastics and thermosetting plastics
II) Explain vulcanization of rubber.

6 i) What are elastomers? Give the preparation and uses of SBR and neoprene.
ii) Give an account of crepe rubber and butyl rubber.

7 i) What is the principle of EDTA method? Describe the estimation of hardness of water by EDTA method.
ii) Explain the desalination of water by reverse osmosis method.

8 What are different types of fuels? What are the characteristics of good fuel

******

Code No: R15A0302

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, October 2020

Engineering Drawing

(ECE, CSE & IT)

Roll No										

Time: 2 hours **Max. Marks: 75**

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

****

1a) Construct an ellipse when its major axis is equal to 100 mm and minor axis is equal to 65 mm.

b) A vertex of a hyperbola is 65 mm from its focus. Draw the curve if the eccentricity is 5/2. Draw a tangent and a normal to the curve at any point on the curve.

2 Draw locus of a point on the periphery of a circle which rolls on a curved path. Take diameter of rolling circle 50 mm and radius of directing circle i.e. curved path, 75 mm. Also, draw a normal and tangent at any point on the curve.

3a) Draw projections of the following points on the same ground line, keeping the projectors 30 mm apart,

i) P, 40 mm above HP and 25 mm in front of the V.P.
ii) Q, 25 mm below the H.P. and 25 mm behind the V.P.
iii) R, 40 mm below the H.P, and 25 mm in front of the V.P.
iv) S, 25 mm above HP and 15 mm behind V.P.
v) T, in the V.P and 40 mm above the H.P.

b) A point A is 20 mm above HP and 30 mm in front of VP. Another point B is 35 mm below HP and 45 mm behind VP. Draw the projections of these points taking the distance between the end projectors as 80 mm. Also find the length of the line joining their plans and elevations.

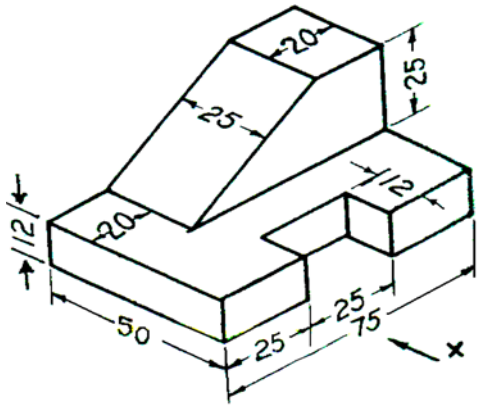
4 A line AB of 75 mm long has its end 'A' 20 mm above H.P and 15 mm in front of V.P. The line is inclined at 30^0 to H.P. and 50^0 to V.P. Draw the projections of line AB.

5 A pentagonal prism, of base side 30 mm and axis 70 mm is resting on one of its rectangular faces in the VP. Draw its projections.

6 A pentagonal pyramid side of base 30 mm and axis 60 mm long rests on one of its base edges on HP and making an angle of 30^0 to V.P. Its axis makes an angle of 45^0 with HP. Draw the projections.

7 Draw an isometric projection of a triangular prism lying on the ground on one of its rectangular face having its base edges = 30, and length of the prism as 60 mm

8 Draw the three principal views of the object given below. All dimensions are in mm.


20
25
25
12
12
20
50
25
25
75
X

****

Code No: R15A0301 **R15**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, October 2020

Engineering Mechanics

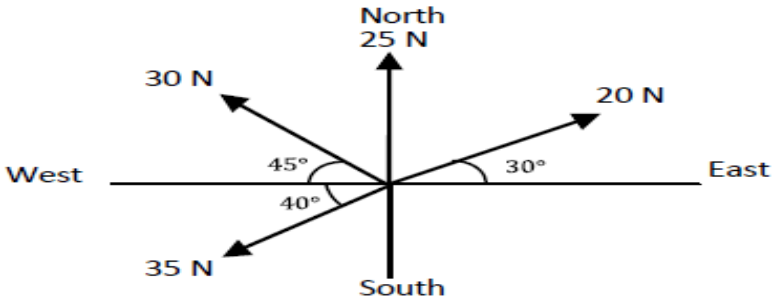
(ME & AE)

Roll No										

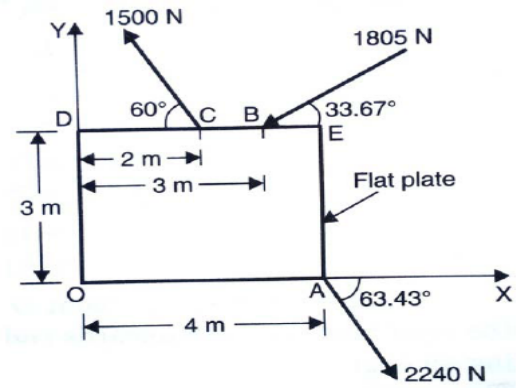
Time: 2 hours **Max. Marks: 75**

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

1 The following forces act at a point: (i) 20 N inclined at 30° towards North of East. (ii) 25 N towards North. (iii) 30 N towards North West. (iv) 35 N inclined at 40° towards South of West as shown in figure below. Find the magnitude and direction of the resultant force.



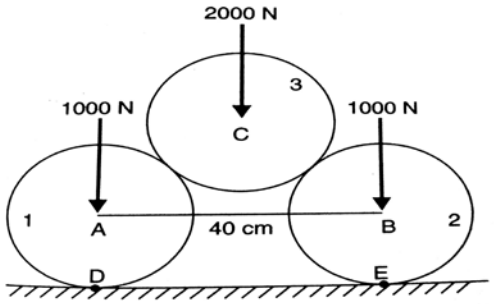
2 The following figure shows the coplanar system of forces acting on a flat plate. Determine the magnitude of the resultant and the direction of the resultant.



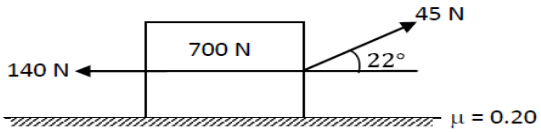
3 Two smooth circular cylinders, each of weight W=1000N and radius 15cm, are connected at their centres by a string AB of length=40cm and rest upon a horizontal plane, supporting above them a third cylinder of weight=2000N and radius 15cm as shown in figure. Find,

a) The force in the string AB.

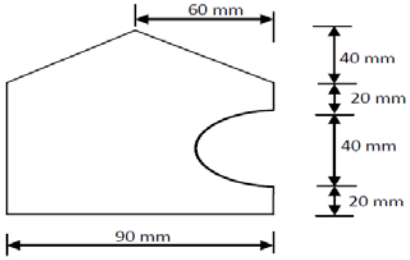
b) The reactions produced on the floor at the points of contact D and E.



4 Find the frictional force in the block shown in figure below and state whether the block is in equilibrium or in motion. Also determine the additional force 'P' that must be added to 140 N force, to just move the block to the left.

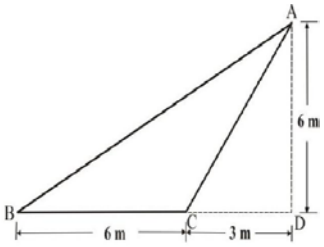


5 Locate the centroid of plane area as shown in figure below.

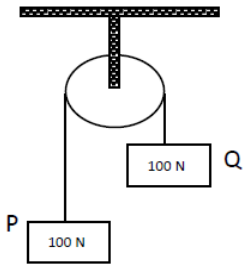


6 Derive the centre of gravity of circular, rectangular and triangle section from integration method.

7 Determine the moment of inertia of the triangle ABC as shown in figure about its horizontal centroidal axis.



8 Block P of weight 100N and block Q of weight 50N are connected by a rope that passes over a smooth pulley as shown in figure below. Find the acceleration of the blocks and the tension in the rope, when the system is released from rest. Neglect the mass of the pulley.



******

R15

Code No: R15A0011

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, October 2020

Engineering Physics

(ME,ECE, CSE , IT& AE)

Roll No										

Time: 2 hours **Max. Marks: 75**

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

1 a) Explain Interference due to reflection from a thin film.
b) With a neat diagram explain the experimental procedure to find the radius of curvature of a given Plano-convex lens using the formation of Newton's rings.

2 a) Deduce an expression for intensity distribution for light diffracted from a single slit and give its diagram.
b) For a diffraction grating of 2500LPI find the maximum order of diffraction and what is the longest wavelength that can be used for this grating element.

3 a) Draw the flowchart for the LASER emission and explain population inversion.
b) Explain Semiconductor laser and its applications.

4 a) Give the construction and working of optical fibers in detail.
b) Distinguish step index and graded index optical fibers.

5 a) State and explain Heisenberg uncertainty principle.
b) Derive Schrödinger's time independent wave equation.

6 a) Explain in detail the Davisson & Germer's experiment to prove the existence of matter waves.
b) Calculate the probability of finding the electron in a 1D box of length 1nm in the range L/4 from the centre of the box in its 1^{st} exited state.

7 a) Explain the terms M.B statistics and BE statistics and effective mass.
b) Explain the consequences of K-P model.

8 a) Derive an expression for the carrier concentration of electrons in conduction band of an intrinsic semiconductor.
b) Explain the working of PN-junction diode as a half wave and full wave rectifier.

******

R15

Code No: R15A0014

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: 75**

Answer Any **Four** Questions

All Questions carries equal marks.

***

1 Explain Food Chains, Food Webs, Ecological Pyramids with examples.

2 Define Bio-Geo Chemical Cycle. Explain any Sedimentary cycle with a neat sketch.

3 Write a detailed note on impacts of Ground and Surface water exploitation.

4 How alternative energy sources meet the requirements of man in present society.

5 Define Bio-diversity. Explain the types of Bio-diversity and uses of Bio-diversity.

6 How Hot- Spots of Bio-diversity is helpful to protect the heritage of our country?

7 Explain the Causes, Effects and control measures of air pollution.

8 Population Explosion is the major cause for all environmental problems – justify with your answer.

******

R15

Code No: R15A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, October 2020

Mathematics-I

(ME, ECE, CSE, IT & AE)

Roll No										

Time: 2 hours **Max. Marks: 75**

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

1 If $A = \begin{bmatrix} 1 & -2 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ then by using Cayley – Hamilton's theorem find A^{-1} .

2 Diagonalize the matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$

3 a). Using Lagrange's mean value theorem prove that

$\frac{\pi}{4} + \frac{3}{25} < \tan^{-1}\frac{4}{3} < \frac{\pi}{4} + \frac{1}{6}$

b). Find the Maclaurin series expansion of the function

$f(x) = \sqrt{1+x}.$

4 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

5 a).Solve $(1+y^2) + \left(x - e^{Tan^{-1}y}\right)\frac{dy}{dx} = 0.$

b).Uranium disintegrates at a rate proportional to the amount present at any instant. If M_1 and M_2 are grams of uranium that are present at times T_1 and T_2 respectively, find the half-life of Uranium.

6 a).Solve $x\frac{dy}{dx} + y = x^3y^6$

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.

7 Apply the method of variation of parameters to solve $(D^2 + a^2)y = Tan(ax)$

8 Solve the differential equation using Laplace transform $\frac{d^2x}{dt^2} + 3\frac{dx}{dt} + 2x = e^{-t}$,

$x(0) = 0, x'(0) = 1.$

******