Code No: R15A0302 **R15**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Engineering Drawing

(ECE, CSE)

Roll No										

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

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

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1 Draw an epicycloid of rolling circle of diameter 40 mm which rolls outside another circle (base circle) of 150 mm diameter for one revolution. Draw a tangent and normal at any point on the curve. **[15M]**

2 Construct a scale of 1:40 to read metres and decimetres and long enough to measure 6 m. Mark on it a distance of 4.7 m. **[15M]**

3 A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P. and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views. **[15M]**

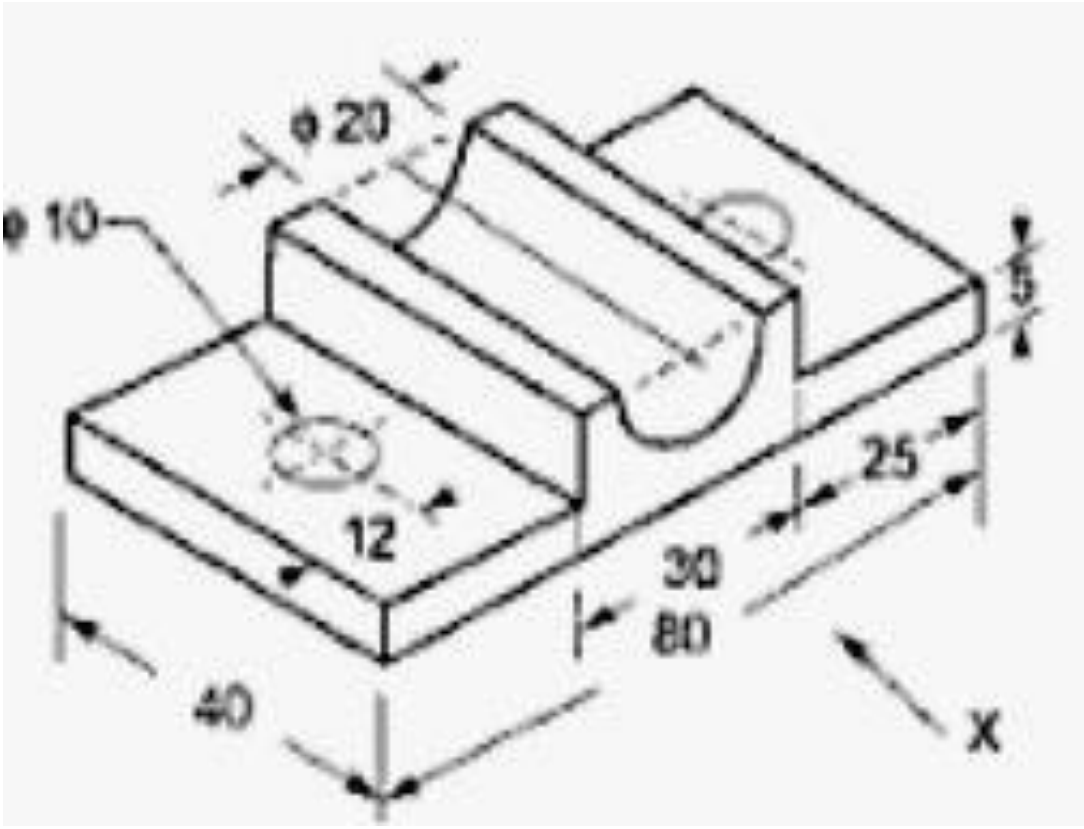
4 A line AB, 90mm long, is inclined at 30^O to the HP. Its end A is 12mm above the HP and 20mm in front of the VP. Its FV measures 65mm. Draw the TV of AB and determine its inclination with the VP. **[15M]**

5 A Circular plane with a 60mm Diameter is resting on a point it's circumference on the VP. The centre is 40 mm above the HP , and The surface is inclined at 45^0 to the VP. And perpendicular to the HP. Draw it's Projections? **[15M]**

6 A pentagonal Prism having a base with a 30 mm side and 60mm long axis, is resting on one of its rectangular faces on the HP. with axis parallel to the VP. Draw its projections? **[15M]**

7 Draw an isometric view of a cylinder, with a 50mm base diameter and 70mm long axis when **[15M]**
(a)The base is on the HP
(b) The base is on the VP

8 Draw Front View, Top view and Side view for the figure shown below. All dimensions are in mm. **[15M]**


ϕ 20
ϕ 10
5
25
12
30
80
40
X

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Code No: R15A0301 **R15**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

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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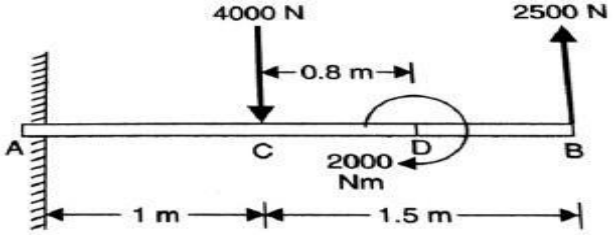
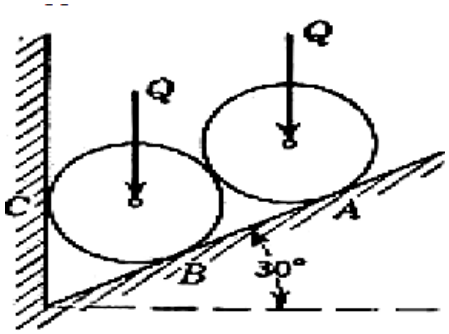
1 Figure shows two vertical forces and a couple of moment 2000 N-m acting on a horizontal rod, which is fixed at, end A. Determine the resultant of the system. **[15M]**



2 The magnitude of the resultant of two concurrent including angle of 90°between them is√13kN.When this included angle is changed to 60°, the magnitude of the resultant becomes√19kN.Find the magnitude of these two forces. **[15M]**

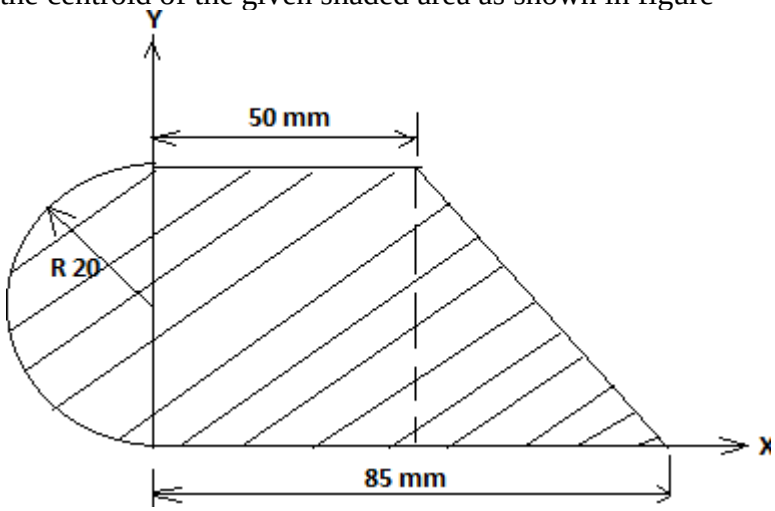
3 An inclined plane and a vertical wall as shown in below Figure support two identical rollers, each of weight 150 N. Assuming the smooth surfaces. Find the reaction induced at the points of support A, B and C **[15M]**



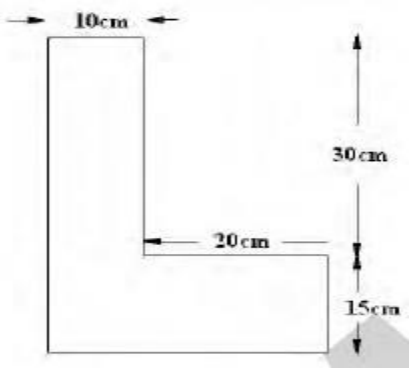
4 In a screw–jack, where the helix angle of thread is α and the angle of friction is φ, W is the load to be moved up/down, and P is the effort applied horizontally to a lever at a distance of L from the axis of the screw, discuss the effects of moving the load **[15M]**

(a) up
(b) down, if
(i) $\varphi<\alpha$, and
(ii) $\varphi>\alpha$ in each case.

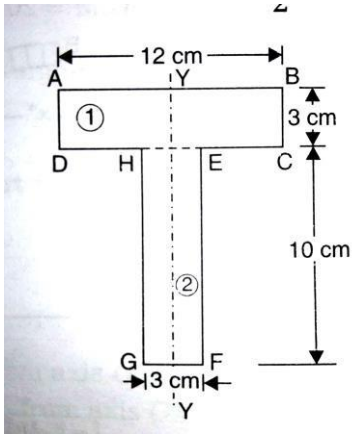
5 Determine the centroid of the given shaded area as shown in figure **[15M]**



6 Determine the centroid of the figure **[15M]**



7 Find the moment of inertia of the T-Section shown in figure. **[15M]**



8 Two trains A and B leave the same station on parallel lines. A starts with a uniform acceleration of 0.15 mt/sec^2 and attains a speed of 24 km/hour when the steam is required to keep speed constant. B leaves 40 seconds after with uniform acceleration of 0.30 mt/sec^2 to attain a maximum speed of 48 km/hour. When will B overtake A ? **[15M]**

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Code No: **R15A0011**

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Engineering Physics-I

(ME, CSE & AE)

Roll No										

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

Answer Any **Five** Questions

All Questions carries equal marks.

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1 Obtain the conditions for the interference of light reflected by a thin parallel film. **[15M]**

2 a. Explain resolving power of grating. **[10M]**

b. Explain Brewster's law. **[3M]**

c. Write a short note on the law of malus **[2M]**

3 a. With neat diagram explain principle, construction and working of Ruby Laser **[11M]**

b. List out the applications of lasers in various fields **[4M]**

4 a. Draw the block diagram of an optical fiber communication system and explain the function of each block **[11M]**

b. List out the application of optical fiber **[4M]**

5 Explain construction and working of Davision - Germer experiment to prove that the moving matter is associated with a wave. **[15M]**

6 Deduce equations for wave function and energy of the particle in a one-dimensional potential box. **[15M]**

7 Discuss the differences between the Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics. **[15M]**

8 Explain how PN junction is formed. Explain the working of PN diode in both forward and reverse bias conditions and explain the energy level diagram of PN junction. **[15M]**

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R15

Code No: R15A0021

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

I B.Tech I Semester Supplementary Examinations, June-2022

Mathematics-I

(ME, CSE, AE)

Roll No										

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

Answer Any **Five** Questions

All Questions carries equal marks.

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1 Find weather the following equations are consistent, if so solve them **[15M]**

$x+y+2z=4,\ 2x-y+3z=9,\ 3x-y-z=2$

2 State and verify Cayley Hamilton theorem , hence find the inverse and A^4 of the matrix $A=\begin{bmatrix}1 & 2 & 3\\ 2 & -1 & 4\\ 3 & 1 & -1\end{bmatrix}$ **[15M]**

3 If $u=\frac{x+y}{1-xy}$, $v=\tan^{-1}x+\tan^{-1}y$. Find $\frac{\partial(u,v)}{\partial(x,y)}$. Hence prove that u and v are Functionally dependent. **[15M]**

4 Verify Rolle's theorem for the function $f(x)=(x-a)^m\ (y-b)^n$ where m,n are positive integers in [a,b] **[15M]**

5 (a) Solve $(2x-y+1)dx+(2y-x-1)dy=0$. **[7M]**

(b) Solve $x^2y\,dx-(x^3+y^3)\,dy=0.$ **[8M]**

6 A bacterial culture, growing exponentially increases from 200 to 500 grms in the period from 6 am to 9 am. How many grams will be present at noon. **[15M]**

7 Solve $(D^2+a^2)y=\tan ax$ by method of variation of parameters. **[15M]**

8 Solve the differential equation $\frac{d^2x}{dt^2}-4\frac{dx}{dt}-12x=e^{3t}$, given that $x(0)=1\ and\ x'(0)=-2$ using Laplace transform. **[15M]**

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