AR16

CODE: 16CE1001 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, February-2018

Building Materials and Construction

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Write about the classification of bricks.	7M
	b)	Define seasoning. Explain various methods of seasoning.	7M
		(OR)	
2.	a)	What are the constituents of good brick earth and explain its functions.	7M
	b)	Write about the classification of stones.	7M

UNIT-II

3.	a)	Write a note on glass reinforced plastics.	6M
	b)	Explain the procedure of production of concrete.	8M
		(OR)	
4.	a)	Describe the properties of plastics.	8M
	b)	What are the uses of mortar?	6M

UNIT-III

5.	a)	Distinguish between English bond and Flemish bond.	6M
	b)	Describe the various types of foundations.	8M
		(OR)	
6.	a)	Write a note on partition walls.	6M
	b)	What are the points to be observed while supervising the brick work?	8M

UNIT-IV

7.	a)	Explain the guidelines to be followed while planning a staircase for a public building.	7M
	b)	Give the classification of roofs.	7M
		(OR)	
8.	a)	Explain Dog-legged staircase with neat sketch.	7M
	b)	Briefly explain the requirements of good floor.	7M

UNIT-V

9.	a)	What is Scaffolding? Explain various types of scaffoldings.	8M
	b)	Discuss briefly about white washing and colour washing.	6M
		(OR)	
10.	a)	Write a short note on lime plaster.	6M
	b)	Explain about the constituents of paints.	8M

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AR16

CODE: 16ME1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, February-2018

ENGINEERING MECHANICS

(For EEE, ECE Branches)

Time: 3 Hours **Max Marks: 70M**

Answer ONE Question from each Unit

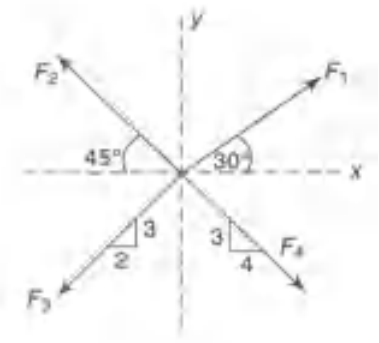
All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

1. a) Explain the conditions for equilibrium of two force system 5M

   b) Find the magnitude and direction of resultant of concurrent forces shown in fig. F1=1500 N F2= 2000 N F3= 3500 N and F4=1000 N 9M



(OR)

2. a) Briefly explain about graphical and analytical methods for finding resultant of several coplanar concurrent forces 9M

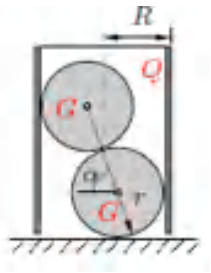
   b) Define couple with an example 5M

UNIT-II

3. a) Define the following: 5M

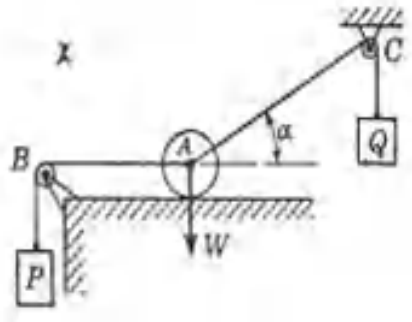
   i) Free body diagram ii) Resultant of a force

b) Two smooth spheres (each having weight G and radius r) rest in a thin-walled circular cylinder (weight Q,radius R = 4r/3) as shown in Figure. Find the magnitude of Q required to prevent the cylinder from falling over. 9M



(OR)

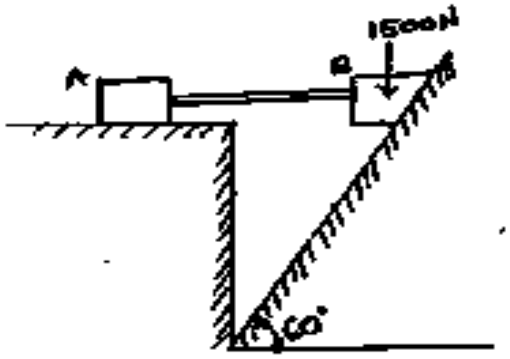
4. a) A ball of weight 'W' rests upon a smooth horizontal plane and has attached to its center two strings AB and AC which pass over frictionless pulleys at B and C and carry loads P and Q, respectively, as shown in Figure. If the string AB is horizontal, find the angle α that the string AC makes with the horizontal when the ball is in a position of equilibrium. Also find the pressure R between the ball and the plane 14M



UNIT-III

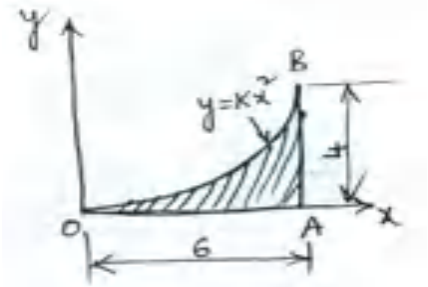
5. a) Define dynamic of friction and static friction 5M

b) Two blocks A and B are connected by a horizontal rod and are supported on two rough planes as shown in fig.2. If the weight of Block 'B' is 1500N and coefficient of friction of Block and B are 0.25 and 0.35 respectively. Find the smallest weight of block 'A' for which equilibrium can exist 9M



(OR)

6. a) Determine the coordinates of the centre of gravity of the area OAB shown in fig. if the curve OB represents the equation of a parabola, given by y = K*x*P2P in which OA=6 units, AB=4 units. 9M



b) Derive the centroid of a triangle with respect to its base 5M

UNIT-IV

7. a) Determine the moment of inertia of I-section about the centroidal axis parallel to the flange, Top flange=100mmx10mm, Bottom flange=200mmx10mm and Web=100mmx10mm 9M

b) State and prove transfer theorem for moment of inertia 5M

(OR)

8. Derive the expression for the moment of inertia of a homogenous right circular cone of mass ‘m’, base radius ‘r’ and altitude ‘h’ with respect to its geometric axis. 14M

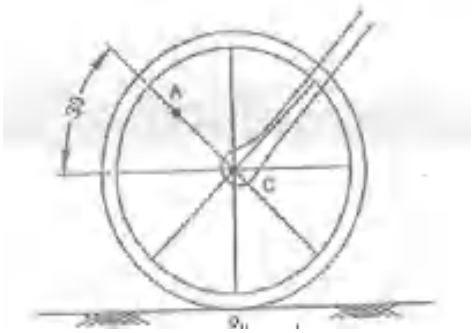
UNIT-V

9. a) A particle moves along a straight line with an acceleration described by the equation $a = -8t^2-2t$, where ‘a’ is in $m/s^2$and ‘S’ in ‘mts’ when t = 1 sec, s = 4m, v = 2m/s. determine acceleration when ‘t’=2 sec. 8M

b) Explain the concept of D’ Alemberts principle 6M

(OR)

10. A cycle is travelling along a straight road with a velocity of 10 m/s. Determine the velocity of point A on the front wheel as shown in Figure. Radius of cycle wheel = 0.4m and distance of A from C = 0.2m 14M



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AR16

CODE: 16ME1003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, February-2018

ENGINEERING MECHANICS (STATICS)

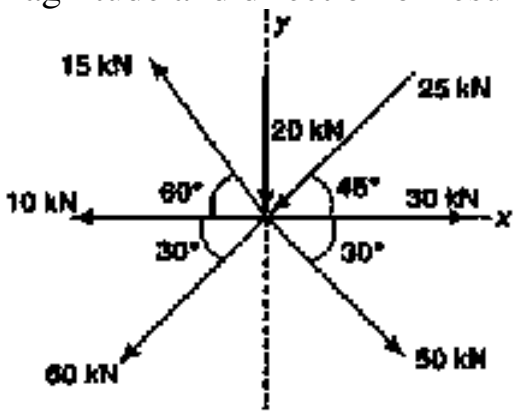
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

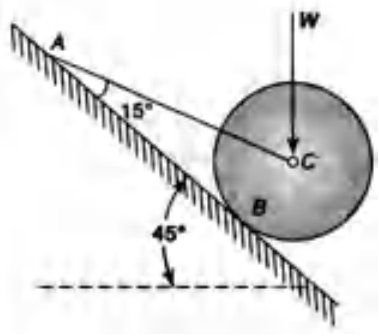
1. a) Briefly explain the following: (6M)
   i) Types of supports and support reactions
   ii) Free body diagram and its importance
   iii) Equillibrium of concurrent forces in space
   b) A system of forces acting on a body is as shown in figure. Determine the magnitude and direction of resultant.



(8M)

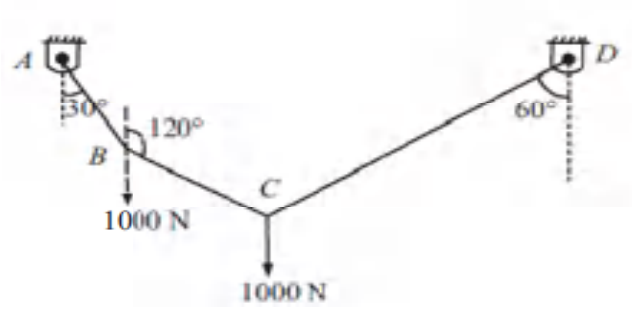
(OR)

2. a) A roller of weight W = 4450 N rests on a smooth inclined plane and is kept from rolling down by a string as shown in figure. Find the tension in the string and the reaction at the point of contact B.



(6M)

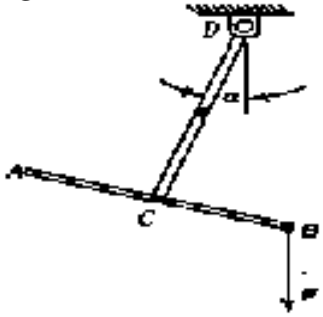
b) A string ABCD, attached to two fixed points A and D has two equal weight of 1000N attached to it at B and C. The weights rest with the portions AB and CD inclined at an angle of 30^0 and 60^0 respectively, to the vertical as shown in figure. Find the tension in the portion AB, BC, CD. (8M)



UNIT-II

3. a) State and prove Varignon's theorem. (6M)

b) Two identical prismatic bars AB and CD are welded together in the form of a rigid T and suspended in a vertical plane as shown in figure. Calculate the angle 'α' that the bar CD will make with the vertical, when a vertical load of F = 45 N is applied at B. The weight of each bar is 25 N.



(8M)

(OR)

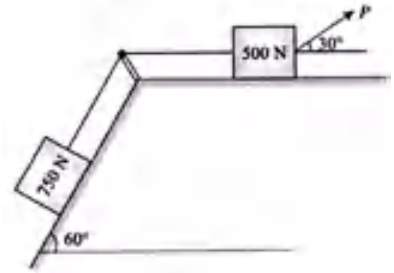
4. a) Briefly explain the following: (8M)

i) Angle of friction ii) Coefficient of friction

iii) Cone of friction

iv) Wedge friction

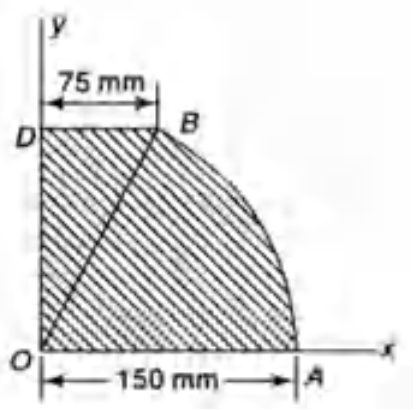
b) What is the value of P in the system as shown in figure to cause the motion to impend? Assume the pulley is smooth and the coefficient of friction for all contact surfaces is 0.2. (6M)



UNIT-III

5. a) State and explain Pappus theorems. (6M)

   b) Locate the centroid of the shaded area OABD shown in figure.

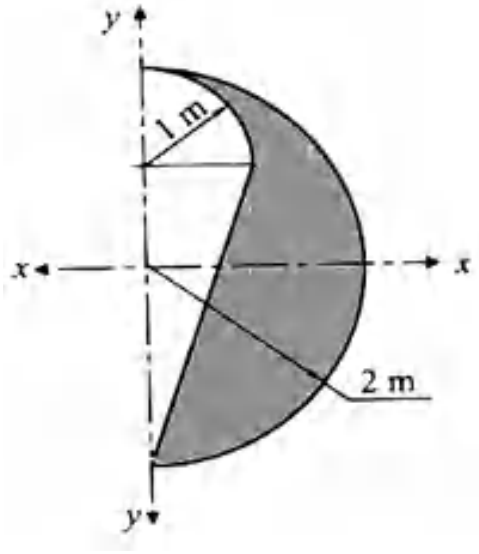


(8M)

(OR)

6. a) Determine the moment of inertia of a triangle of base width 'b' and height 'h' about its base. (6M)

   b) Determine the moment of inertia of the shaded area as shown in the figure about the x-x axis and y-y axis.

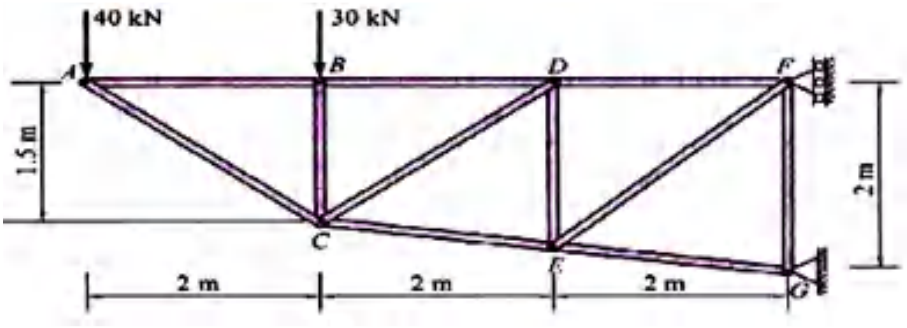


(8M)

UNIT-IV

7. a) Briefly explain the following: (6M)
   i) Types of trusses ii) Assumptions made in the analysis of trusses

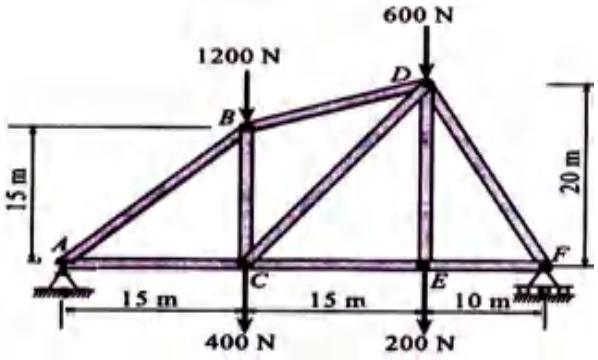
   b) A truss loaded and supported as shown in figure, calculate the force in the members BC, CD and EF by using method of sections.



(8M)

(OR)

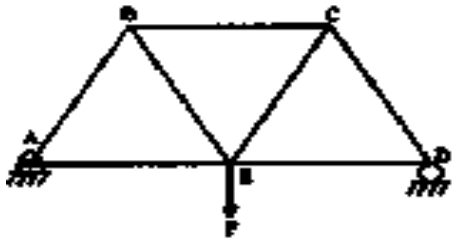
8. A pin jointed truss is loaded and supported as shown in figure. Determine the forces in all the members (14M)



UNIT-V

9. a) State and explain the principle of virtual work. Also explain how it can be used in solving problems in statics. (6M)

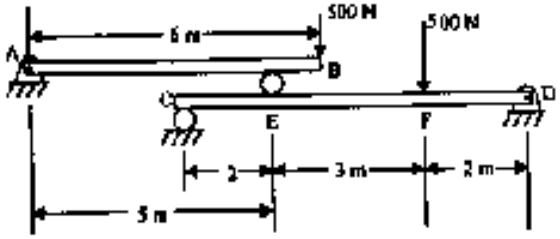
   b) A simple truss consisting of equilateral triangles is shown in figure. Using principle of virtual work, determine force in the top member BC.



(8M)

(OR)

10. Two beams AB and CD are supported on rollers at E and C as shown in figure. The beam AB is hinged at A and beam CD is hinged at D. Determine the reactions at the rollers using the method of virtual work.



(14M)

AR16

Code: 16EE1003 **Set No :1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2018
Electrical and Electronics Engineering
(Common to CSE & IT Branches)

Time: 3 hours **Max Marks: 70**

Answer One Question from each unit
All Question carry Equal Marks
All parts of the Questions must be answer in one place only

UNIT I

1. a) Derive the equations to convert star to delta connection in circuits ? 6M
   b) Fin the value of current 'I' in the circuit shown in fig (1) and also find the power dissipation in 18 KΩ resistor? 8M

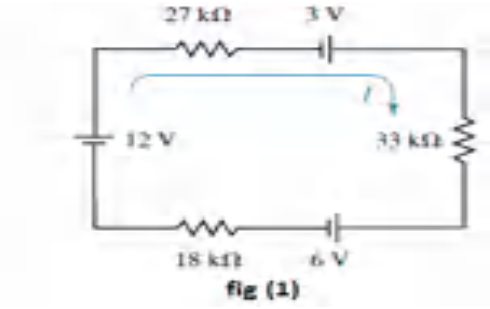


fig (1)

(OR)

2. a) Write the brief note on V-I relationships of inductor and capacitor? 6M
   b) Find the equivalent circuit between the A and B terminals and current drawn from source in the circuit shown in fig (2) 8M

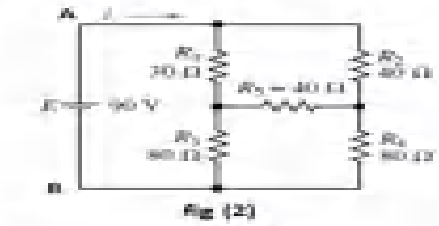


fig (2)

UNIT II

3. a) Explain the construction of DC machine with neat diagram? 7M
   b) Explain the principle of operation of DC generator and derive the EMF equation? 7M

(OR)

4. a) Explain the operation of three point starter with neat diagram? 6M
   b) What are the classification of DC motor and explain with relevant equations? 8M

UNIT III

5. a) What are the different losses in Transformer and draw the equivalent circuit diagram of Transformer ? 8M
   b) Derive the EMF equation of Single phase Transformer? 6M

(OR)

6. a) Explain the principle of operation of 3-Ø induction motor? 6M
   b) Describe the Speed –Torque characteristics of 3-Ø induction motor? 8M

UNIT IV

7. a) Explain synchronous impedance method to find the regulation of alternator? 8M
   b) Explain the principle of operation of alternator? 6M

(OR)

8. a) With neat diagram explain the construction and operation of PMMC instrument? 8M
   b) Explain different necessary torques for the operation of indicating instruments? 6M

UNIT IV

9. a) What is break down voltage of diode and explain with help of its characteristics? 6M
   b) Explain how alternating voltage is converted into dc voltage by using full wave rectifier? 8M

(OR)

10. a) Explain the working of transistor in common base configuration? 6M
    b) A crystal diode having resistance of $r_f = 20\Omega$ is used for half wave rectification. If the applied voltage is v= 50 sin wt and load resistance $R_L=800\Omega$. Find the dc current and dc power output of rectifier? 8M

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AR13

CODE: 13BS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, February-2018

ENGINEERING MATHEMATICS-II

(Common to CIVIL, MECH, CSE & IT)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Write Newton Raphson iterative formula.
   b) Write the normal equations for straight line fitting.
   c) Write Newton forward interpolation formula.
   d) Prove $\Delta = E - 1$
   e) Write Simpson's one-third rule of integration.
   f) Write the Euler's formula.
   g) Write the statement of first shifting theorem
   h) Find $L^{-1}\left(\frac{1}{(s-a)^2+1}\right)$
   i) Solve $z = px + qy + \sin(p+q)$
   j) Write one dimensional heat equation

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Find a real root of the equation $xe^x - \cos x = 0$ using Newton Raphson method. 6M
   b) Fit a straight line for the following data 6M

x	6	7	7	8	8	8	9	9	10
y	5	5	4	5	4	3	4	3	3

(OR)

3. a) Find a real root of $xe^x = 3$ using Regula –Falsi method. 6M
   b) Fit a curve of the form $y = a + bx + cx^2$ for the following data. 6M

x	10	15	20	25	30	35
y	35.3	32.4	29.2	26.1	23.2	20.5

UNIT-II

4. a) Find $f(2.5)$ using Newton forward formula from the following table: 6M

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

b) Evaluate $\int_0^1 \frac{1}{1+x^2}dx$ using Simpson's $\frac{3}{8}$ rule taking $h=\frac{1}{6}$. 6M

(OR)

5. a) Using Langrange's formula fit a polynomial to the data 6M

x	-1	0	2	3
y	-8	3	1	12

b) Evaluate $\int_{0.6}^{2.0} y\,dx$ using Trapezoidal rule. 6M

x	0.6	0.8	1	1.2	1.4	1.6	1.8	2
y	1.23	1.58	2.03	4.32	6.25	8.38	10.23	12.45

UNIT-III

6. a) Solve $\frac{dy}{dx}=2x-y, y(1)=3$ by Picard's method up to 2nd approximation. 6M

b) Solve numerically $\frac{dy}{dx}=y+e^x, y(0)=0$ for $x=0.2$ by modified Euler's method. 6M

(OR)

7. a) Solve $\frac{dy}{dx}=x+y, y(1)=0$. Find $y(1.1)$ and $y(1.2)$ by Taylor's series method. 6M

b) Using Runge-Kutta method, find $y(0.2)$ for the equation 6M

$\frac{dy}{dx}=\frac{y-x}{y+x}, y(0)=1$.

UNIT-IV

8. a) Find $(i)L\left[e^{-t}\sin 3t\right]$ $(ii)L\left[\int_0^t\int_0^t\int_0^t (t\sin t)\,dtdtdt\right]$ 6M

b) Apply convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$ 6M

(OR)

9. a) Find $L\left[e^{-t}\int_0^t \frac{\sin t}{t}dt\right]$ 6M

b) Find $L^{-1}\left[\frac{2s^2-6s+5}{s^3-6s^2+11s-6}\right]$ 6M

UNIT-V

10. a) Form the partial differential equation from $f\left(x^2+y^2, z-xy\right)=0$ 6M

b) Solve $\frac{y^2z}{x}p+xzq=y^2$ 6M

(OR)

11. a) Form the partial differential equation from $z=(x+y)\phi\left(x^2-y^2\right)$ 6M

b) Solve $p^2+q^2=x+y$ 6M

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AR13

Code: 13ME1003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2018
ENGINEERING MECHANICS
(Common to EEE & ECE)

Time: 3 hours **Max Marks: 70**

PART-A

Answer all questions **[10 x 1=10M]**

1. a) Define moment of a force
   b) What are equations of Equilibrium
   c) State Lami's theorem.
   d) Define Limiting Friction
   e) Define angle of friction
   f) State parallel axis theorem
   g) Define centre of gravity
   h) Define moment
   i) Define inertial force
   j) Define relative motion.

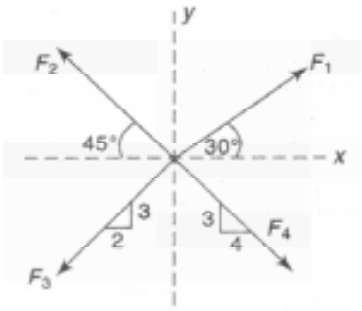
PART – B

Answer one question from each unit **[5x12=60M]**

UNIT-1

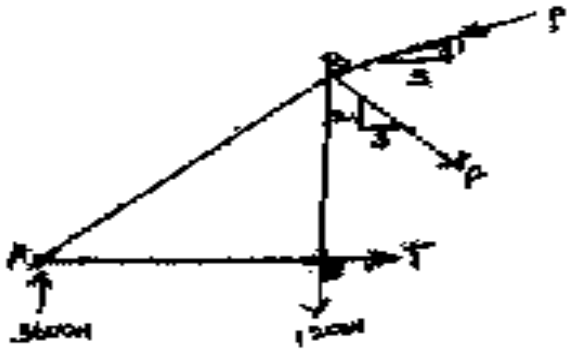
2.a) Explain the conditions for equilibrium of two force system.

b) Find the magnitude and direction of resultant of concurrent forces shown in fig. F1=1500 N F2= 2000 N F3= 3500 N and F4=1000 N



(OR)

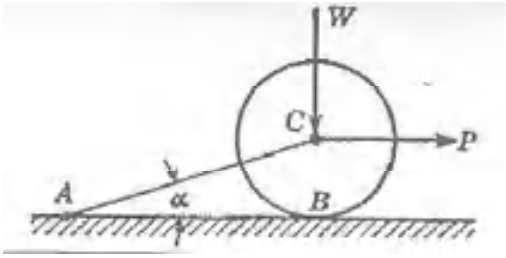
3. **a)** Determine the force P, F and T required to keep the triangular frame ABC shown in Figure.2 in equilibrium



b) Write about: (i) concurrent and non-concurrent forces
(ii) coplanar and non-coplanar forces

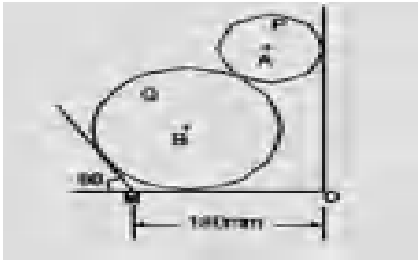
UNIT-II

4. a) Explain various force systems with neat sketches
b) A right circular roller of weight W rests on a smooth horizontal plane and is held in position by an inclined bar AC as shown in Figure. Find the tension S in the bar AC and the vertical reaction Rb at B if there is also a horizontal force P acting at C.



(OR)

5. Two cylinders P and Q rest in a channel as shown in the figure . The cylinder P has a diameter of 100 mm and weighs 200 N where as the cylinder Q has diameter of 180 mm diameter and weighs 500 Newtons. If the bottom width of the box is 180 mm, with one side vertical and the other inclined at 600, determine the reactions at all the four points of contact.

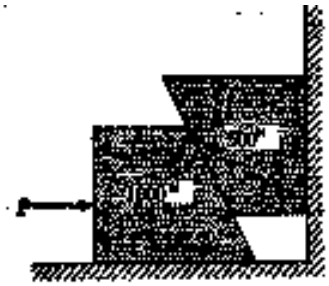


AR13

Code: 13ME1003 **SET-2**

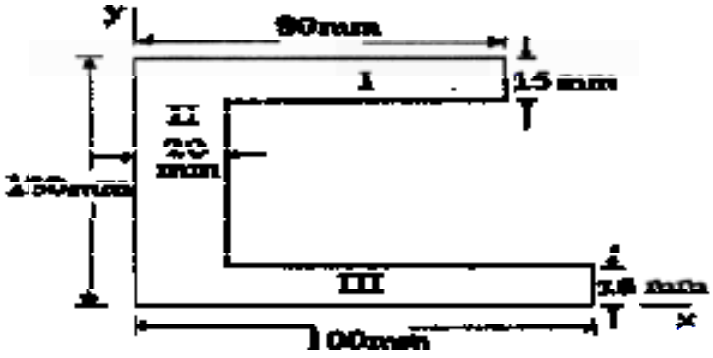
UNIT-III

6. Referring to Figure the coefficient of the friction are as follows:0.25 at the floor, 0.30 at the wall, and 0.20 between blocks. Find the minimum value of a horizontal force P applied to the lower block that will hold the system in equilibrium**.**



(OR)

7. Find the centroid of the plane lamina shown in figure.

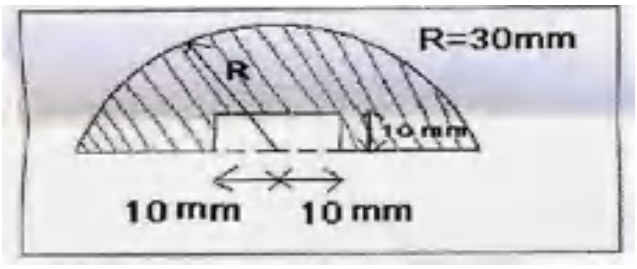


UNIT-IV

8. a) State and prove transfer formule for moment of inertia.
b) Derive the expression for the moment of inertia of a homogenous right circular cone of mass „m" , base radius „r" , and altitude „h" with respect to its geometrical axis.

(OR)

9. a) Prove that product of inertia of plane figure with axis of symmetry is zero
b) Find the moment of inertia about the horizontal centroidal axis of shaded portion.



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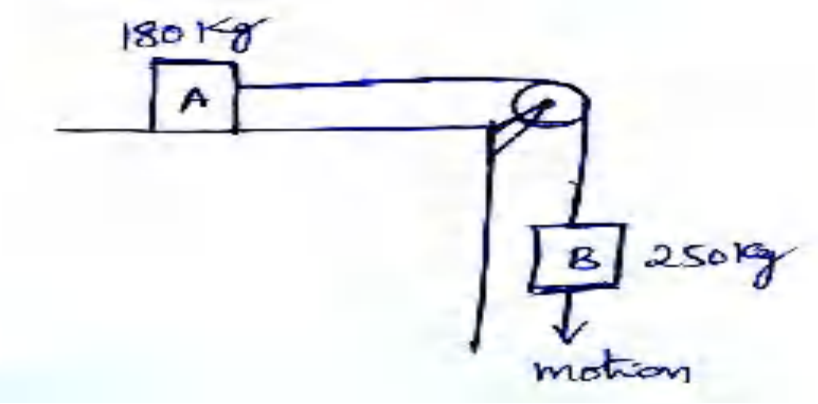
UNIT-V

10. a. Explain the concept of D' Alemberts principle

b. A particle moves along a straight line with an acceleration described by the equation a = -8t2-2t, where 'a' is in m/s2and 'S' in 'mts' when t = 1 sec, s = 4m, v = 2m/s. determine acceleration when 't'=2 sec.

(OR)

11. Two blocks are joined by an inextensible cable as shown in figure.8 if the Block 'B' is released from rest determine the speed of block 'A' after it has travelled 3mt assuming friction coefficient between the plane and block 'A' as 0.25. Assume the pulley to be mass less and friction less (use work-energy principle)



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