AR16

CODE: 16CE1001 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, March-2017

BUILDING MATERIALS AND CONSTRUCTION

(Civil Engineering Branch)

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

Answer ONE Question from each UNIT

All Questions Carry Equal Marks

All parts of a Question must be answered in one place only

UNIT-I

1.(a) Explain Various tests for bricks [6 M]

(b) Define Seasoning and describe briefly various methods of Seasoning [8 M]

(OR)

2.(a) Write the Comparison between Fat lime and Hydraulic lime [6 M]

(b) Explain various qualities of good timber [8 M]

UNIT-II

3.(a) Explain the Preparation methods for different mortars [6 M]

(b) Describe any Four varieties of Steel alloys [8 M]

(OR)

4.(a) Explain the classification of Plastics [6 M]

(b) Describe the properties of Fiber reinforced plastics [8 M]

UNIT-III

5.(a) Describe various Functions of Foundations [6 M]

(b) Explain various Methods of Damp proofing [8 M]

(OR)

6.(a) Explain various Defects in Brick masonry [6 M]

(b) Describe briefly about Damp Proof course treatment in buildings [8 M]

UNIT-IV

7.(a) Describe briefly about Construction of Various Flooring materials [8 M]

(b) Write the Advantages and Disadvantages of Flat roofs [6 M]

(OR)

8. Write notes on the following:

(a) Revolving door [6 M]

(b) Sliding door [4 M]

(c) Rolling door [4 M]

UNIT-V

9.(a) Define Scaffolding and what are the Component parts of a Scaffold [6 M]

(b) Explain briefly how Preconstruction anti-termite treatment is carried out [8 M]

(OR)

10.(a) Define plastering and Explain briefly about the mortars commonly used for plastering [6 M]

(b) Explain the process of Varnishing and types of varnishes [8 M]

*****

AR16

CODE: 16EE1003 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, March-2017

ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CSE, IT 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)	State Kirchhoff's current and voltage laws. Explain with suitable examples.	7M
	b)	Derive the expressions for converting a Star network to a Delta network.	7M

(OR)

2.	a)	Write the brief notes on V-I relationships for the following elements i) Inductor ii) capacitor.	6M
	b)	Three resistances r, 2r, 3r are connected in Delta. Determine the resistances for an equivalent Star connection.	8M

UNIT-II

3.	a)	Derive an E.M.F. equations of D.C Generator.	7M
	b)	A 30KW,300v D.C shunt generator has armature and field resistances of 0.05 ohm and 100 ohm respectively. Calculate the total power delivered by the armature when it delivers full load output.	7M

(OR)

4.	a)	Draw and Explain the internal and external characteristics of D.C. shunt generator.	8M
	b)	A 4-pole motor is fed at 440v and takes an armature current of 50A. The resistance of the armature circuit is 0.28 ohms. The armature is wave-wound with 888 conductors and the useful flux per pole is 0.023Wb. Calculate the speed.	6M

UNIT-III

5.	a)	Explain the principle and operation of 3-Phase Induction motor with neat diagram.	7M
	b)	Derive the power and torque equations of 3-phase Induction motor.	7M

(OR)

6.	a)	Discuss the procedure for implementing OC and SC tests on a single phase transformer.	8M
	b)	A single phase 50Hz transformer has 80 turns on the primary winding and 280 turns on the secondary winding. The voltage across the primary winding is 240 V at 50 Hz. Calculate i) the maximum flux density in the core and ii) induced e.m.f. in the secondary. the net cross sectional area of the core be taken 200 $cm.^2$	6M

UNIT-IV

7.	a)	Explain the principle and operation of an alternator with neat diagram.	7M
	b)	Explain the procedure to find the regulation of alternator by synchronous impedance method.	7M

(OR)

8.	a)	Explain the different torques in measuring instruments.	8M
	b)	What are the differences between M.I and M.C instruments?	6M

UNIT-V

9.	a)	Explain the working and operation of full wave rectifier and draw the output wave forms.	7M
	b)	Draw the different configurations of N-P-N transistor.	7M

(OR)

10.	a)	Explain the working of P-N junction diode and its applications.	6M
	b)	A half wave rectifier has a load of 3.5 kΩ. If the diode resistance and secondary coil resistance together has a resistance of 800 Ω. The input voltage has a single voltage of peak value 240V. Calculate a) Peak, average and r m s value of current flowing b) D.C. power output c) A.C. power input and d) efficiency of the rectifier.	8M

AR16

CODE: 16ME1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017

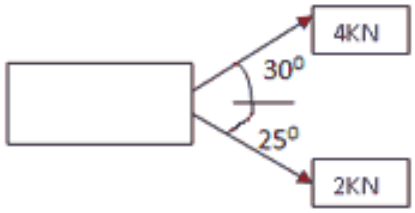
ENGINEERING MECHANICS
(For EEE, ECE Branches)

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 at one place only

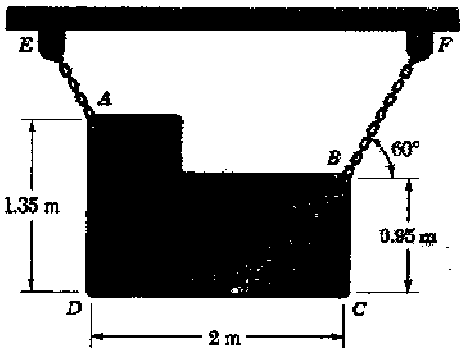
UNIT-I

1. A Disabled automobile is pulled using two ropes as shown in the figure. Determine graphically the magnitude and direction of their resultant using (i) Parallelogram Law(ii) Triangle Law 14



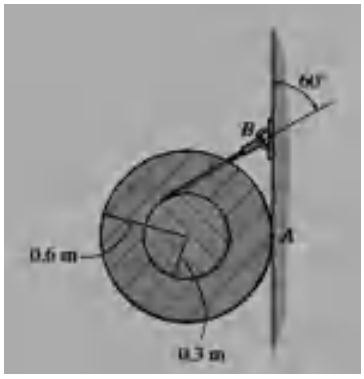
(OR)

2. A Sign board suspended from two chains AE and BF. Knowing that the tension in BF is 200N, determine (a) the moment about A of the force exerted by the chain at B, (b) the smallest force applied at C which creates the same moment about A 14



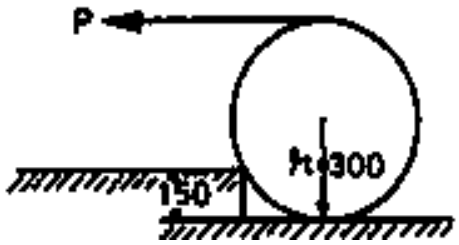
UNIT-II

3. Determine the minimum coefficient of static friction between the uniform 50 kg spool and the wall so that the spool does not slip. 14



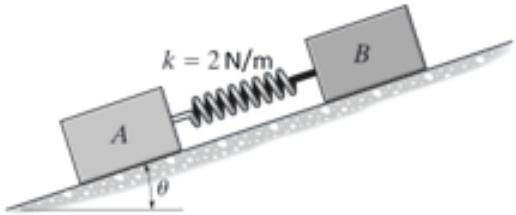
(OR)

4. A roller of radius r = 300 mm and weight 2000 N is to be pulled over a curb of height 150 mm by a horizontal force P applied to the end of a string wound tightly around the circumference of the roller. Find the magnitude of P required to start the roller move over the curb. What is the least pull P through the centre of the wheel to just turn the roller over the curb as shown in Fig. 14



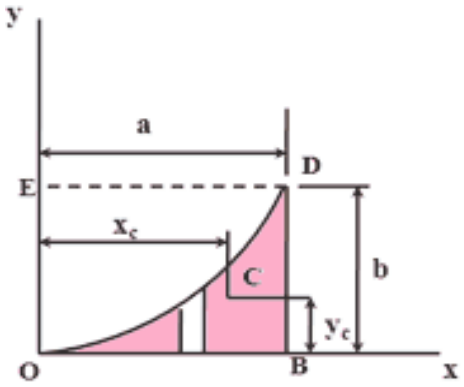
UNIT-III

5. Two blocks A and B have a weight of 5 N and 3 N respectively are resting on the incline for which the coefficients of static friction are μ_A=0.15 and μ_B=0.25.Determine the angle θ which will cause motion of one of the blocks. What is the friction force under each of the blocks when this occurs? The spring has a stiffness of k=2N/m and is originally unstretched. 14



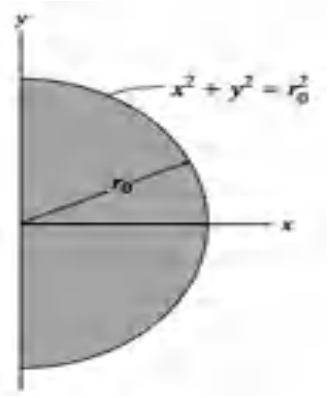
(OR)

6. Determine the coordinates x_c and y_c of the centroid C of the area of the spandrel OBD if the curve OD is a portion of a parabola $x^2 = 4ky$ with vertical axes OY as shown in Figure. 14



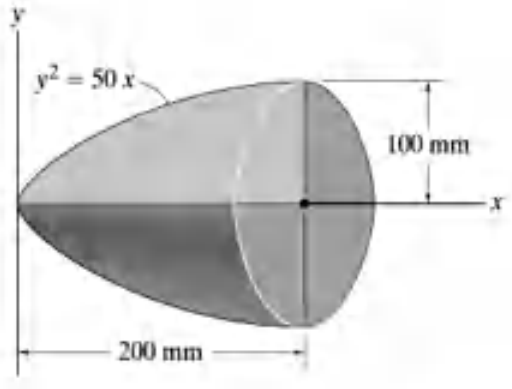
UNIT-IV

7. Determine the moment of inertia of the semi circular area about the x axis by integration method. 14



(OR)

8. The paraboloid is formed by revolving the shaded area around the x axis. Determine the radius of gyration k_x. The density of the material is 5 Mg/m^3 14



UNIT-V

9.	a	Define and explain D'Alembert's principle .	7
	b	A train starts from a Station A and accelerates uniformly at 4 m/s^2 for the first 3 seconds and at 1.25 m/s^2 for the next 8 seconds. Then it travels with a uniform velocity for 5 minutes and comes to rest at station B in 10 seconds with uniform retardation. Determine the retardation and the distance travelled between the two stations A and B.	7

(OR)

10.		A flywheel weighing 5000N and having a radius of gyration 1 m losses its speed from 400 rpm to 280 rpm in 2 minutes, then calculate (i) the retarding Torque acting on it, change in its kinetic energy during the above period, (ii) change in its angular momentum during the same period.	14

***

AR16

CODE: 16ME1003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, March-2017
ENGINEERING MECHANICS (STATICS)
(Mechanical Engineering Branch)

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) Four coplanar forces are acting at a point as shown in Fig.01 .One of the forces is unknown and its magnitude shown by P. If the resultant acting along the X-axis is 500N, determine the unknown force and its direction. **7M**

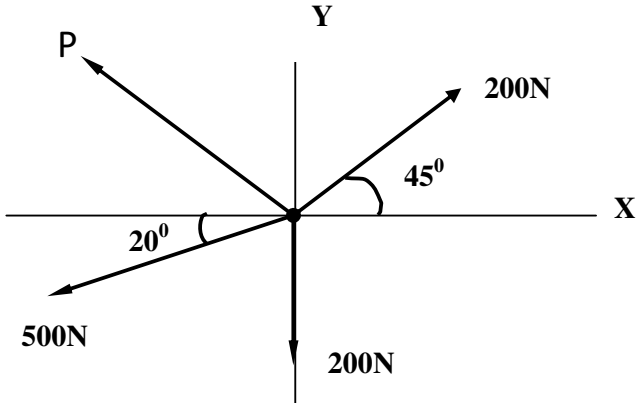


Fig.01

b) The sum of two concurrent forces P and Q is 270N and their resultant is 180N. The angle between the force P and resultant R is $90^{o.}$ Find the magnitude of each force and angle between them **7M**

(OR)

2. a) State triangle law of forces and Lame's theorem. **4M**

b) Three bars, hinged at A and D and pinned at B and C as shown in Fig. 02, form a four-link mechanism. Determine the value of P that will prevent motion**.** **10M**

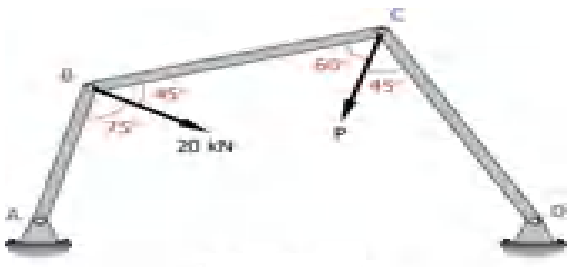


Fig.02.

UNIT-II

3. a) What is moment of a force? State "varignon's theorem **6M**

b) A rigid bar AB=20m is supported in a vertical plane and carries a load Q=600kg at its free end as shown in Fig.03. Neglecting the weight of the bar itself, compute the magnitude of the tensile forces S in the horizontal string CD=5m. **8M**

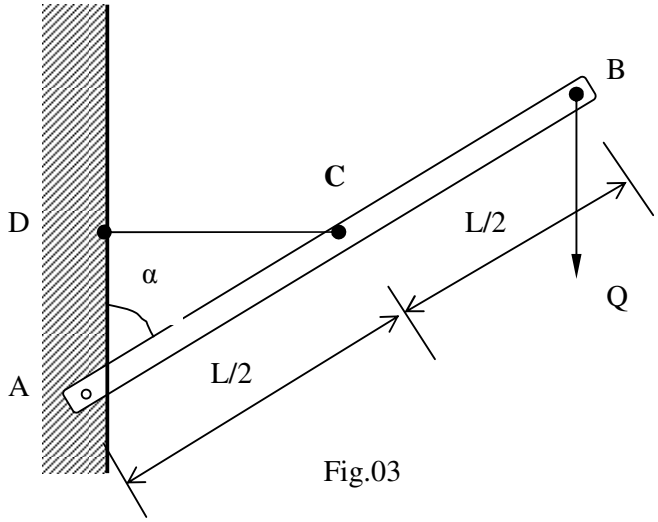
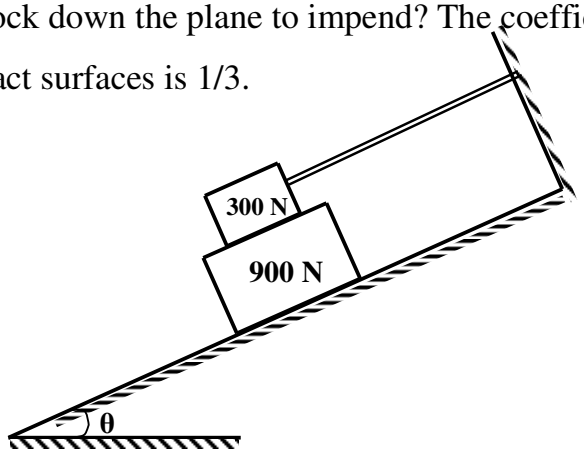


Fig.03

(OR)

4. What should be the value of 'θ' in figure, which will make the motion of 900N block down the plane to impend? The coefficient of friction for all contact surfaces is 1/3. **14M**



UNIT-III

5. Determine the coordinates x_c and y_c of centroid 'C' of the area between the parabola $y = \frac{x^2}{a}$ and the straight line y=x as shown in Fig.05. **14M**

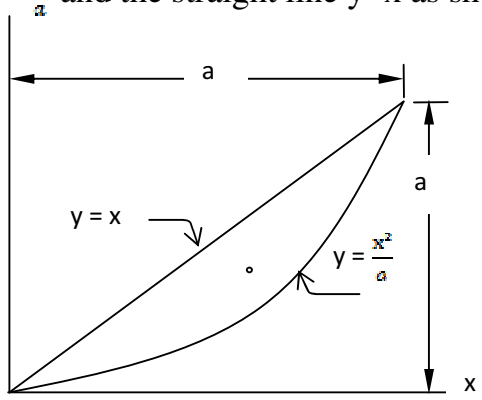


Fig.05

(OR)

6. a) What is moment of inertia of the shaded area about x- axis? **6M**

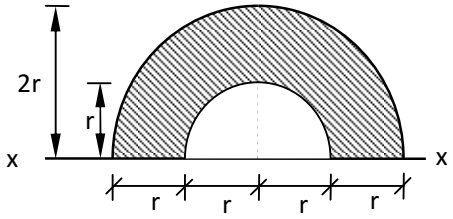


Fig. 06

b) Derive the moment of inertia of triangle about centroidal axis having base 'b' with height 'h' **8M**

UNIT-IV

7. Determine the axial forces induced in the members of a truss as shown in figure. **14M**

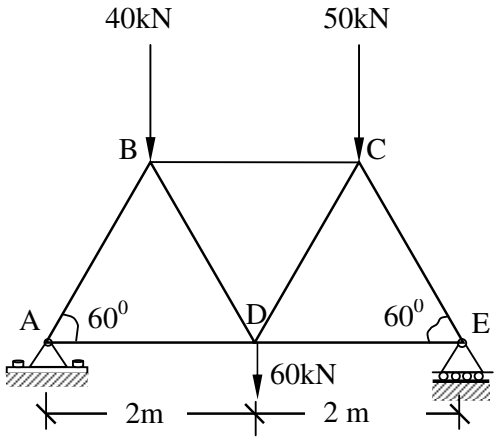
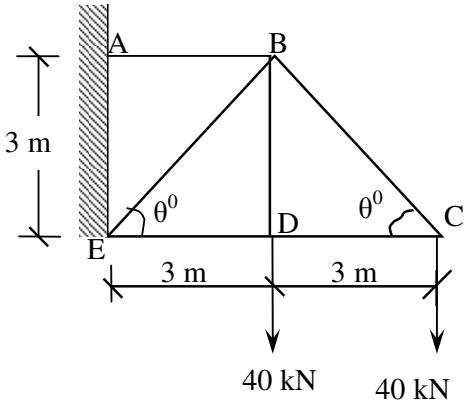


Fig.07

(OR)

8. a) Distinguish between simply supported trusses and cantilever truss with example. **4M**

   b) Determine the axial forces induced in the members of a truss as shown in figure.



10M

Fig.08

UNIT-V

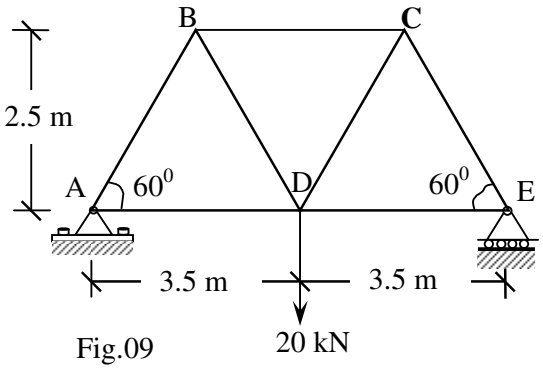
9. a) Explain principle of virtual work **4M**

   b) A slender prismatic bar AB of length 'l' and weight Q stands in a vertical plane and is supported by smooth surfaces A & B, Bar makes an angle 30^0 with horizontal. Using principle of virtual work, find the value of horizontal force P applied at A if the bar is in equilibrium. **10M**

(OR)

10. a) List out the advantages of virtual work? **4M**

    b) Applying principle of virtual work, determine the reactions at A & E and also the axial force in the member BC of simple truss shown in figure below.



10M

Fig.09

******

AR13

CODE: 13BS1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, March-2017

ENGINEERING MATHEMATICS-II
(Common to CE, ME, CSE & IT)

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

PART-A

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

1. a) The root of the equation $x^3-4x-9=0$ lies between----&-----
   b) Write the normal equations of the second degree polynomial.
   c) Simpsons one – third rule states that
   d) Evaluate $L^{-1}\{2S-5/S^2-4\}$.
   e) Write a formula for Newton's Backward interpolation.
   f) Write the formula for R-K method of 4^{th} order
   g) Write second shifting theorem.
   h) Find $L\{\sin at+cohat\}$.
   i) Eliminate arbitrary Constants a & b from Z=ax+by+(a/b)-b.
   j) Write one-dimensional heat equation.

PART-B

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

UNIT-I

2. a Find the real root of the equation xtanx+1=0 , using Newton-Raphson method. **6**
   b Find the root of the equation $x\log_{10}x=1.2$ using False position method. **6**

(OR)

3. a Derive the normal equations of straight line. **6**
   b Find a real root of the equation $x^3-x-1=0$ correct to two decimal places by Bisection method. **6**

UNIT-II

4 a The population of a town in the decimal census was given below. Estimate the population for the Year 1895 **8**

Year(x)	1891	1901	1911	1921	1931
Population(Y) In thousands	46	66	81	93	101

   b Find $\Delta^5 u$, given that $u_0=3, u_1=12, u_2=81, u_3=200, u_4=100, u_5=8$ **4**

(OR)

5. a Given u_1 =22, u_2=30, u_4 =82, u_7=106, u_8=206. Find 'u_6 'use Lagrange's Interpolation formula. **6**

   b Evaluate $\int_0^1 \frac{1}{1+x} dx$ by usingTrapezoidal rule. **6**

UNIT-III

6. a Using the Taylor's series method solve $dy/dx = x - y^2$, with y (0) =1 at x=0.1and x=0.2 **6**

   b Using Euler's method, solve for y at x=0.1from $dy/dx = x + y^2$,y(0)=1 with h=0.05 **6**

(OR)

7. a . Solve $\frac{dy}{dx}$ = y+x , y(0)=1 by Picard's method method. **6**

   b Using Runge-kutta method of fourth order, solve $\frac{dy}{dx}$ = x-y, with y (0) =1 at x=0.1 **6**

UNIT-IV

8. a Find the laplace transform of $e^{-3t}(2\cos 5t - 3\sin 5t)$ **6**

   b Find the laplace transform of $te^{2t}\sin 3t$ **6**

(OR)

9. a Find the inverse laplace transform of $4/(s+1)(s+2)$ **6**

   b Using convolution theorem to find the inverse laplace transform of $1/(s^2+a^2)^2$ **6**

UNIT-V

10. a Form the PDE by Eliminating the arbitrary constant h,k from $(x-h)^2+(y-k)^2+z^2=a^2$. **6**

    b Form a Partial differential equation by eliminating the arbitrary functions $Z=f(x^2-y^2)$. **6**

(OR)

11. Solve the method of separation of variables $u_x = 2u_t + u$ where $u(x,0)=6e^{-3x}$ **12**

***

AR13

Code: 13ME1003 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B. Tech I Semester Supplementary Examinations, March-2017

ENGINEERING MECHANICS
(Common to EEE & ECE)

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

PART-A

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

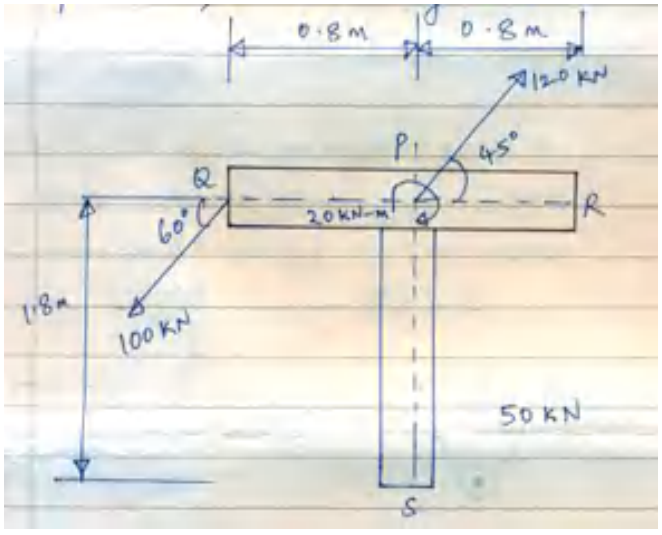
1. a) Define free-body diagram.
   b) State the law of transmissibility of forces.
   c) State Parallelogram Law of forces.
   d) Define cone of static friction.
   e) Define Dynamic friction.
   f) Write the Difference between Centroid and Center of gravity in one line.
   g) State perpendicular axis theorem.
   h) Define the term Radius of gyration
   i) Define Rectilinear Motion.
   j) Define absolute motion.

PART – B

Answer one question from each unit **[5 x 12=60M]**

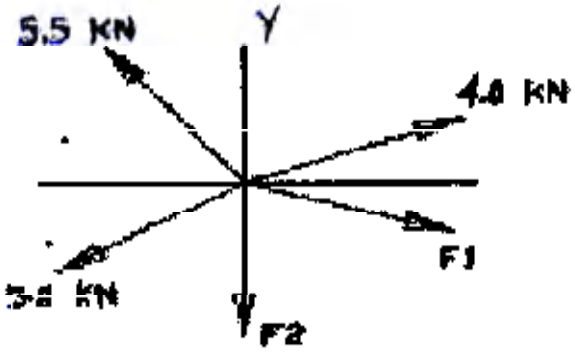
UNIT-1

2. A T bracket is applied with a system of non concurrent coplanar forces as shown in the figure. Determine the magnitude and direction of the equivalent force and the distance from point 'p', which can give the same effect.



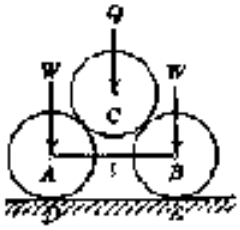
(OR)

3. (a) Explain briefly Varignon's theorem
   (b) The forces shown in the figure below are in equilibrium. Determine the forces F1 and F2



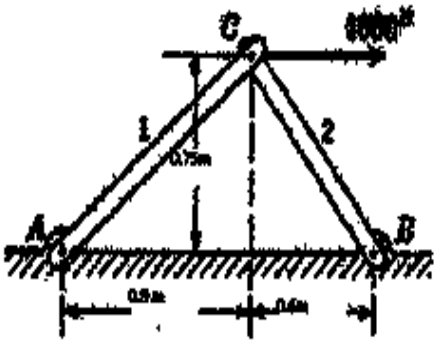
UNIT-II

4. Two smooth circular cylinders, each of weight W = 1000N and radius 15cm, are connected at their centres by a string AB of length 40 cm and rest upon a horizontal plane supporting above them a third cylinder of weight Q= 2000 N and radius 15 cm as shown in Figure. Find the force 'S' in the string AB and the pressure produced on the floor at the points of contacts D and E.



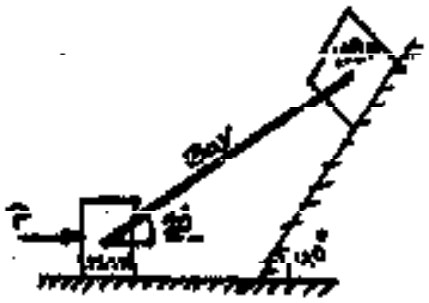
(OR)

5. Determine the axial forces S1and S2 induced in the bars AC and BC in Fig. due to the action of the horizontal force 1000N applied at C. The bars are hinged together at C and to the foundation at A and B.



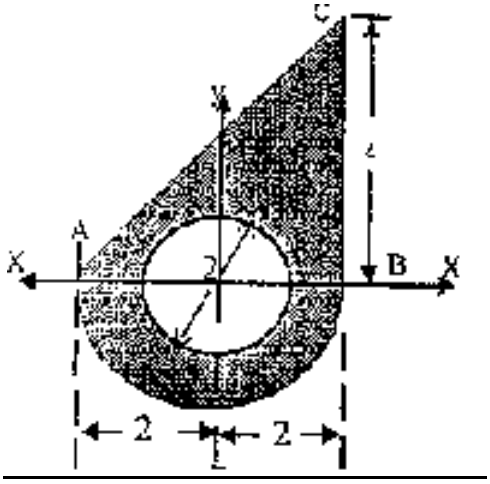
UNIT-III

6. A 108 N block is held on a 40° incline by a bar attached to a 150 N block on a horizontal plane Figure. The bar which is fastened by smooth pins at each end is inclined 20° to the horizontal. The co-efficient of friction between each block and its plane is 0.325. For what horizontal force P, applied to 150N block will motion to the right be impending?



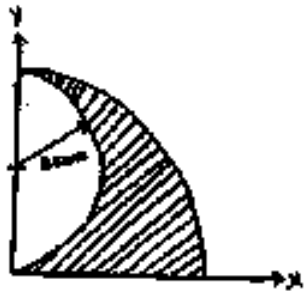
(OR)

7. (a) Derive the centroid of a triangle with respect to its base.
   (b) Find the centroid of the shaded area with respect to X and Y axis for the Figure shown below.



UNIT-IV

8. (a) State and prove parallel axis theorem
   (b) Find the moment of inertia of the shaded area shown in Figure about the X-axis.



(OR)

9. Derive the mass moment of inertia of a sphere from the first principle.

UNIT-V

10. A golfer hits a golf ball with an initial velocity of 50 m/s at an angle of 25° with horizontal, determine the horizontal range between the golfer and point where the ball first lands, maximum height and time of flight.

(OR)

11. (a) Define and explain D'Alembert's principle .
    (b) A train starts from a Station A and accelerates uniformly at 4 m/s2 for the first 3 seconds and at 1.25 m/s2 for the next 8 seconds. Then it travels with a uniform velocity for 5 minutes and comes to rest at station B in 10 seconds with uniform retardation. Determine the retardation and the distance travelled between the two stations A and B.

***