AR16

CODE: 16OE2012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

WATER SHED MANAGEMENT

(Open Elective-I)

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)	Define watershed development? what are the objectives of watershed development	7 M
	b)	Explain the different disciplines that associate with watershed management	7 M
		(OR)	
2.	a)	Explain the basic data and inputs useful in implementing a watershed development	7 M
	b)	Discuss the influence of the following characteristics of watershed development (i) Drainage (ii) Size and Shape (iii) socio economic considerations	7 M

UNIT-II

3.	a)	Explain the factors influencing the erosion of soil in a watershed?	7 M
	b)	Describe the all soil erosion control measures in a watershed and discuss any two measures in detail	7 M
		(OR)	
4.		Explain in detail how the following measures arrest the soil erosion in a watershed (i) ploughing (ii) furrowing (iii) Bunding (iv) Trenching (v) Terracing	14 M

UNIT-III

5.	a)	Discuss in detail about Catchment harvesting and soil moisture conservation?	7 M
	b)	Discuss in detail about water harvesting structures?	7 M
		(OR)	
6.	a)	Explain the soil moisture conservation through check dams and farm ponds	7 M
	b)	State that the soil moisture conservation through percolation tanks & recharge pits	7 M

UNIT-IV

7.	a)	Describe the reasons for formation of saline and alkaline soils and explain the steps for reclaim to normal state	7 M
	b)	Describe the management of Agriculture and Grass lands in a watershed program	7 M
		(OR)	
8.	a)	Discuss in detail the land use and land capability classifications	7 M
	b)	Explain the management of Forest land and wild lands in a watershed management	7 M

UNIT-V

9.	a)	Describe what is an eco system? Explain its significance in a watershed management	7 M
	b)	Explain in detail Bio-Mass management and crop husbandry	7 M
		(OR)	
10.	a)	Discuss how dry land agriculture and horticulture are managed in an ecosystem	7 M
	b)	Discuss about the inter, mixed and strip cropping pattern	7 M

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AR16

CODE: 16OE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

MATRICESAND APPLICATIONS

(Open Elective-I)

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) Reduce the matrix $A = \begin{bmatrix} 1 & 4 & 3 & -2 & 1 \\ -2 & -3 & -1 & 4 & 3 \\ -1 & 6 & 7 & 2 & 9 \\ -3 & 3 & 6 & 6 & 12 \end{bmatrix}$ into Echelon form and determine its rank. 7M

   b) Solve the system of equations $x + 2y + 3z = 1; 2x + 3y + 8z = 2;$ $x + y + z = 3$ by using Gauss elimination method. 7M

(OR)

2. Reduce the matrix $A = \begin{bmatrix} 2 & 1 & 3 & 4 \\ 0 & 3 & 4 & 1 \\ 2 & 3 & 7 & 5 \\ 2 & 5 & 11 & 6 \end{bmatrix}$ to Normal form and determine its rank. 14M

UNIT-II

3. a) Determine the Eigen values and the corresponding Eigen vectors of the matrix 10M

$$A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

   b) Show that the matrix $H = \begin{bmatrix} 4 & 1-3i \\ 1+3i & 7 \end{bmatrix}$ is a Hermitian matrix. 4M

(OR)

4. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ also determine $A^{-1}$and A^4 14M

UNIT-III

5. Solve the system of equations $x + y - z = 4; x - 2y + 3z = -6; 2x + 3y + z = 7$, by LU decomposition method. 14M

(OR)

6. a) Calculate three iterations of the power method with scaling to approximate a dominant eigen vector of the matrix $A = \begin{bmatrix} 4 & -5 \\ 2 & 3 \end{bmatrix}$. Use $x_0 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$ as the initial approximation. 7M

   b) Solve the system of equations $x + y + z = 9; 2x + 5y + 7z = 52;$ $2x + y - z = 0$ by using matrix inversion method. 7M

AR16

CODE: 16OE2011 SET-2

UNIT-IV

7. Reduce the quadratic from $3x^2 + 5y^2 + 3z^2 - 2xy - 2yz + 2zx$ to the canonical form by diagonalisation and determine the rank, index, signature and nature. 14M

(OR)

8. a) Determine the rank, nature, index and signature of the quadratic form $x^2 + y^2 + 2z^2 - 2xy + 4yz + 4xz$ by using lagrange's reduction. 8M

   b) Write down the quadratic form corresponding to the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 0 & 3 \\ 3 & 3 & 1 \end{bmatrix}$. 6M

UNIT-V

9. Write the matlab code to solve the linear system of equation $a_{11}x_1 + a_{12}x_2 - a_{13}x_3 + a_{14}x_4 = d_1, a_{21}x_1 + a_{22}x_2 - a_{23}x_3 + a_{24}x_4 = d_2, a_{31}x_1 - a_{32}x_2 + a_{33}x_3 + a_{34}x_4 = d_3, a_{41}x_1 + a_{42}x_2 + a_{43}x_3 + a_{44}x_4 = d_4$ by using Gauss elimination method. 14M

(OR)

10. Write the matlab code to find the eigen values and the corresponding eigen vectors of $= \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$. 14M

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AR16

CODE: 16OE2013 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

INTRODUCTION TO MATLAB

(Open Elective-I)

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 the historical background and applications of MATLAB. 7M
   b) What are the MATLAB desktop windows? Write a short note on these. 7M

(OR)

2. a) Write a short note on arithmetic operators available in MATLAB with an example. 7M
   b) Write a short note on data types available with MATLAB. 7M

UNIT-II

3. a) Explain 'one dimensional arrays' in MATLAB. 8M
   b) Determine the results for following? 6M

A = [8 4 5 3; 2 3 4 9; 5 2 4 6] ; B = [3 8; 6 2; 3 7; 4 9];

i)A(3,4)+B(4,1)
ii)A(3,:)
iii)B(:,2)
iv)A(2,:) = [ ]
v)B'
vi)A([2,3,2,3],:)

(OR)

4. a) Write an user defined function in MATLAB to find the roots of quadratic equation 3x^2+5x+9. 7M
   b) Write the syntax for function and explain the 'function calling another function' in MATLAB. 7M

UNIT-III

5. Explain the 'conditional statements' in MATLAB with examples. 14M

(OR)

6. a) Write a script file to arrange the numbers in descending order. 7M
   b) Write a short note on 'nested for' loop with an example. 7M

CODE: 16OE2013 **SET-1**

UNIT-IV

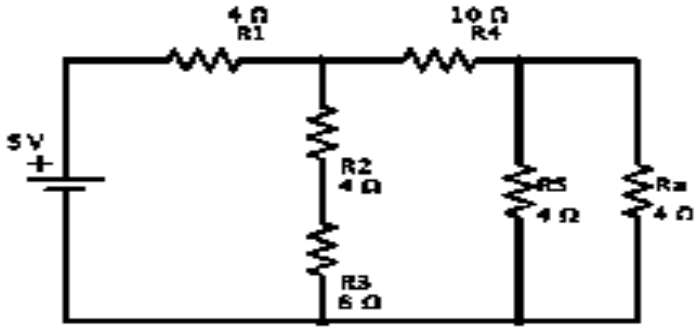
7. a) Write a short note on plotting graphs in MATLAB. 7M
   b) Give a simple code for plotting '30sin(wt)' in the range of 0<wt<4π. 7M

(OR)

8. a) A vehicle moving from position 1 to 2, has distance to time relationship given by s=2(t^2)+t+2. Derive the relationships for velocity and acceleration of the vehicle? And Write a simple MATLAB code for above problem in the range of 0<t<1hr 7M
   b) Explain 'solve' and 'roots' commands in MATLAB. 7M

UNIT-V

9. a) Write a short note on importance of Simulink. 7M
   b) Construct the Simulink model for the following electrical network for observing voltage across and current flowing through 8Ω resistor and also find the values. 7M



(OR)

10. a) Explain briefly about masking block in Simulink. 7M
    b) Write a short note on mathematical modelling of physical systems and construct the Simulink model for following equation. 7M
    dy/dt=(t^2)+y .

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AR16

CODE: 16OE2014 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

FUNDAMENTALS OF MATERIAL SCIENCE

(Open Elective-I)

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.	Briefly explain about different types of defects?	14M
	(OR)	
2.	Classify crystal imperfections and explain any two crystal imperfections?	14M

UNIT-II

3.	Briefly explain about the deformation by twinning and slip mechanism?	14M
	(OR)	
4.	What are the deformation mechanism and explain deformation of single crystal.	14M

UNIT-III

5.	What are the advantages and disadvantage of hot working and cold working?	14M
	(OR)	
6.	Briefly explain about solidification mechanism in pure metals?	14M

UNIT-IV

7.	Draw the stress strain diagram for mild steel material and explain various curves in stress strain diagram?	14M
	(OR)	
8.	Define following terms i). Stress ii). Strain iii). Hardness iv). Modules of elasticity v). Proof stress vi). Ductility vii). malleability	14M

UNIT-V

9.	Define creep and briefly explain about the creep test?	14M
	(OR)	
10.	Briefly explain about the Izod impact test?	14M

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AR16

CODE: 16OE2015 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

INTRODUCTION TO ELECTRONIC MEASUREMENTS

(Open Elective-I)

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.	Draw and explain the circuit and operation of shunt type Ohm meter.	7M
	b.	Explain about different types of errors that occur in measurements.	7M
		(OR)	
2.	a.	Explain thermocouple type ammeter.	8M
	b.	Define the following terms in brief. (i) Error (ii) Sensitivity (iii) Expected value	6M

UNIT-II

3.	a.	Explain how function generator generates sine wave, triangular wave and square wave?	7M
	b.	What is a wave analyzer? What is its use? Explain the working of a wave analyzer?	7M
		(OR)	
4.	a.	Draw and explain the circuit of standard and AF sine and square wave generator?	7M
	b.	Draw and explain the block diagram of a Harmonic distortion analyser?	7M

UNIT-III

5.	a.	Draw the block diagram of general purpose CRO and explain its working?	8M
	b.	List and briefly explain CRT features.	6M
		(OR)	
6.	a.	Explain the working of Dual trace CRO with neat block diagram.	7M
	b.	Explain the working of Digital storage oscilloscope with neat block diagram.	7M

UNIT-IV

7.	a.	Derive the expression for bridge balance of AC Bridge Balance?	7M
	b.	With the help of circuit diagram explain how unknown inductance value can be determined using Maxwell's bridge?	7M
		(OR)	
8.	a.	Explain the basic principle of wheat stone bridge and derive the expression to find the value of unknown resistance?	8M
	b.	At bridge balance if R_1=10k, R2=15k, R_3=40k, find the unknown resistance value?	6M

UNIT-V

9.	a.	What is Transducer? Write the classification of transducers with examples?	7M
	b.	Explain the operation of a LVDT with a neat diagram and show how linear displacement is measured?	7M
		(OR)	
10.	a.	What is seebeck effect? Write short notes on Thermocouples?	7M
	b.	Draw and explain the block diagram of data acquisition system?	7M

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AR16

CODE: 16OE2016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

UNIX UTILITIES

(Open Elective-I)

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)	With a neat sketch, explain the relationship between the kernel and the shell of the UNIX operating system.	8 M
	b)	Describe the salient features of the UNIX operating system.	6 M
		(OR)	
2.	a)	How to begin an UNIX operating system?	7 M
	b)	Explain procedure to change the password of an Existing user?	7 M

UNIT-II

3.	a)	Explain file system structure in UNIX with neat sketch?	6 M
	b)	Explain the three modes of the Vi-Editor.	8 M
		(OR)	
4.		Explain following Unix commands i) date ii) ls iii) mkdir iv) wc v) cat	14 M

UNIT-III

5.	a)	Explain about shell? What are the various types of shells? How to change current shell to another shell from command line area?	10 M
	b)	Write a short note on Electronic mail?	4 M
		(OR)	
6.	a)	What is the standard input and standard output? How do you achieve redirection using pipes? Explain with an example.	10 M
	b)	Write a short note on process ?	4 M

UNIT-IV

7.	a)	Write a short note about shell script?	6 M
	b)	Write a shell script for perform an arithmetic operation between two numbers?	8 M
		(OR)	
8.		What are the various control structures available in UNIX? Give example with structures?	14 M

UNIT-V

9.	a)	What is X windows? Write a short note on X windows environment?	8 M
	b)	How to start an Windows X ?	6 M
		(OR)	
10.		Explain following commands with example? i) finger ii) telnet iii) ftp iv) ping	14 M

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AR16

CODE: 16OE2017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December- 2017

IT SYSTEMS MANAGEMENT

(Open Elective-I)

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. How do 2- tier and 3-tier architectures will function? 14M

(OR)

2. Write short notes on : Grid computing Cluster computing 14M

UNIT-II

3. a What is the essence of STO approach(Strategy-Tactics-operations) 7M
   b Describe how crucial to gather customers requirements 7M

(OR)

4. Describe the steps involved in IT Service management 14M

UNIT-III

5. Describe the Common tasks of ITSM 14M

(OR)

6. a Write the differences between Project and Product 7M
   b What is meant by Dead code 7M

UNIT-IV

7. Write the features of LAN & case study of footprints? 14M

(OR)

8. Mention key factors of OAMP 14M

UNIT-V

9. Mention the concept of Hierarchical storage management 14M

(OR)

10. What are the requirements of back up? 14M

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AR13

CODE: 13EC2003 **SET-2**

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

SWITCHING THEORY AND LOGIC DESIGN
(Common to EEE & ECE)

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

PART-A

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

1. a) What do the extreme right and left digits indicate in a binary digits?
   b) What do you mean by BCD codes?
   c) Convert 01011111.011111 to Hexadecimal.
   d) What is universal logic?
   e) What are "don't cares" ?
   f) Why multiplexer is called as Data selector?
   g) What is priority encoder?
   h) How many flip-flops are required to store 'n' bit data?
   i) What are the basic types of Shift registers?
   j) What is the meaning of "Ripple"?

PART-B

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

UNIT-I

2. Perform the subtraction of the following: 12M
   (a)1010 – 0111 using 2's complement
   (b) 0111 – 1010 using 2's complement
   (c)72532 – 3250 using 10's complement

(OR)

3. A Hamming code sequence is 1100110 is transmitted and due to error in one position, is received as 110110, locate the position of error bit and write the correct sequence. Use even parity. 12M

UNIT-II

4.	a	Find the complements of the following expression i) A+B+A'B'C ii) A+B'C(A+B+C')	6M
	b	Implement the following functions i) F= a(b+c+cd)+bc' ii) G=(a+b').(cd+e')	6M

(OR)

5.		Reduce the expression to minimum number of literals and implement in AOI Logic a) f= A+B[AC + (B+C')D] b) f= (B+BC) (B+B'C)(B+D) c) f= [A+(BC) '] ' (AB' + ABC)	12M

UNIT-III

6.		Using the Quine –McCluskey method of tabular reduction. Minimize the given combinational single output function. F(w,x,y,z)= ∑m(0,1,5,7,8,10,14,15)	12M

(OR)

7.		Design a 4 bit Binary to Gray code converter.	12M

UNIT-IV

8.	a	Design an 1- bit magnitude comparator.	6M
	b	Design a 4- bit priority encoder.	6M

(OR)

9.	a	Use a multiplexer to implement the logic function F= A⊕B ⊕C	6M
	b	Explain about Ripple carry adder.	6M

UNIT-V

10.	a	Define the operating characteristics of flip-flops.	6M
	b	What is race around condition and how it is eliminated in Master slave JK flip flop? Explain.	6M

(OR)

11.		Design a MOD-8 ripple counter and explain the operation of counting.	12M

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RA / AR13

CODE: 13ME1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, December-2017

CLASSICAL MECHANICS

(Mechanical Engineering)

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

PART-A

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

1. a) Differentiate between moment of a force and a couple.
   b) Define free body diagram.
   c) What are the assumptions made in the analysis of perfect trusses.
   d) What is meant by virtual work?
   e) State Pappus theorems.
   f) Define polar moment inertia.
   g) Differentiate between rectilinear and curvilinear translation.
   h) A lift of weight 5000 N moves up with an acceleration 2 m/sec^2. Determine the tension in the cable of the lift.
   i) State the principle of work and energy.
   j) What is the equation of motion for a rigid body rotating about fixed axis?

PART-B

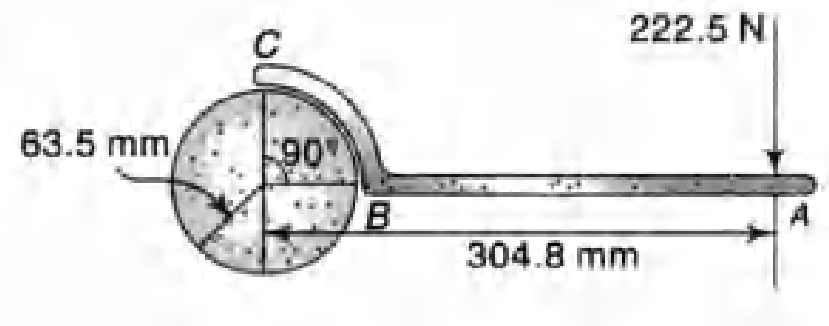
Answer one question from each unit **[5x12=60M]**

UNIT-I

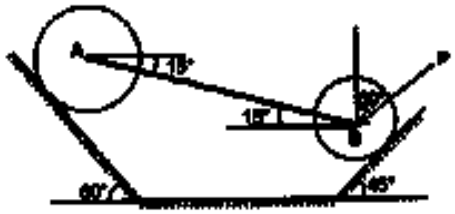
2. a) State and prove parallelogram law of forces. (6M)
   b) Four forces of magnitude P, 2P, $3\sqrt{3}$ P and 4P are acting at a point O. The angles made by these forces with X-axis are 0°, 60°, 150° and 300° respectively. Determine the magnitude and direction of the resultant force. (6M)

(OR)

3. a) Determine the forces exerted on the cylinder at B and C by the spanner wrench shown figure due to a vertical force of 222.5 N applied to the handle. Neglect friction at B. (4M)



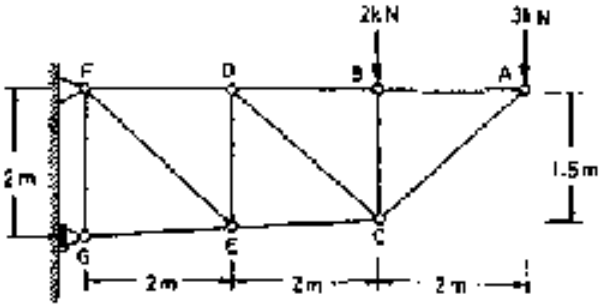
b) Two cylinders, A of weight 4000 N and B of weight 2000 N rest on smooth inclines as shown in figure. They are connected by a bar of negligible weight hinges to each cylinder at its geometric centre by smooth pins. Find the force P to be applied as shown in the figure such that it will hold the system in the given position. (8M)



UNIT-II

4. a) Briefly explain method of joints and method of sections in the analysis of trusses? State the advantage of method of sections over method of joints. (4M)

b) A cantilever truss is loaded as shown in figure. Find the forces in all the members of the truss. (8M)

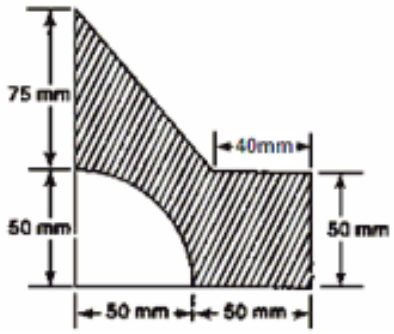


(OR)

5. Two beams AC and CD of lengths 9 m and 10 m respectively are hinged at C. These are supported on rollers on the ends A and D, and a hinged support at B which lies at distance 7 m from A. The beam is acted upon by a concentrated load of 700 N at point E, located 6 m from end A. Determine the reactions at the hinge C and at the support B. Use the principle of the virtual work. (12M)

UNIT-III

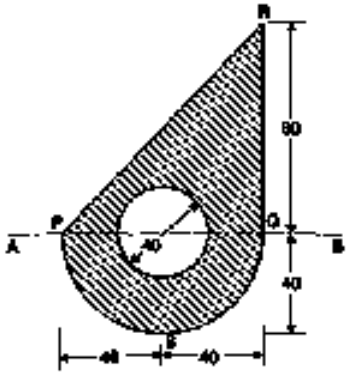
6. a) Find the coordinates of the centroid of the shaded area as shown in figure. (6M)



b) Determine the centre of gravity of a solid hemisphere of radius 'R' from its diametral axis (6M)

(OR)

7. a) Find moment of inertia of the shaded area shown in the figure about the axis AB. (8M)

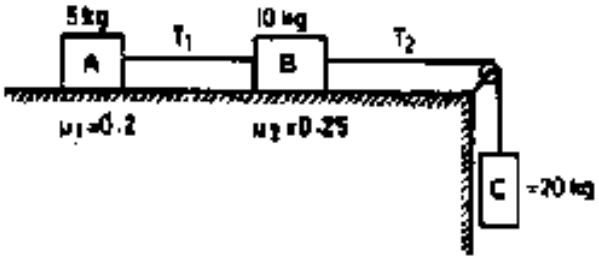


b) State and prove transfer theorem of mass moment of inertia. (4M)

UNIT-IV

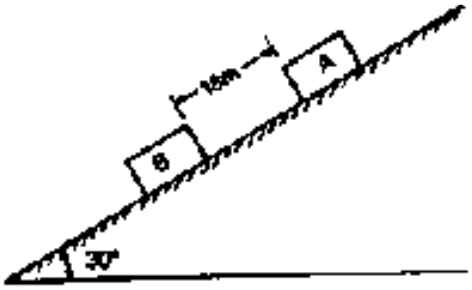
8. a) A stone dropped into a well is heard to strike the water in 4 seconds. Find the depth of the well, assuming the velocity of sound to be 335 m/sec. (4M)

b) Three blocks A, B and C are connected as shown in figure. Find the acceleration of masses and tension T_1 and T_2 in the strings. Given $\mu_1 = 0.2$ and $\mu_2 = 0.25$. (8M)



(OR)

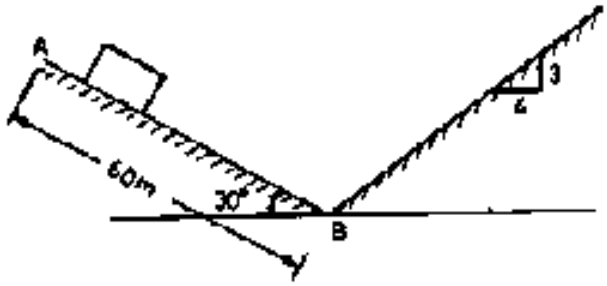
9. Two blocks A and B are released from rest on a 30° incline, when they are 18 m apart as shown in figure. The coefficient of friction under the upper block A is 0.2 and that under the lower block B is 0.4. In what time block A reaches the block B? After they touch and move as a single unit, what will be the contact force between them? Weights of the blocks A and B are 100 N and 80 N respectively. (12M)



UNIT-V

10. a) A glass marble, whose weight is 0.2 N, falls from a height of 10 m and rebounds to a height of 8 m. Find the impulse and the average force between the marble and the floor, if the time during which they are in contact is 1/10 of a second. (4M)

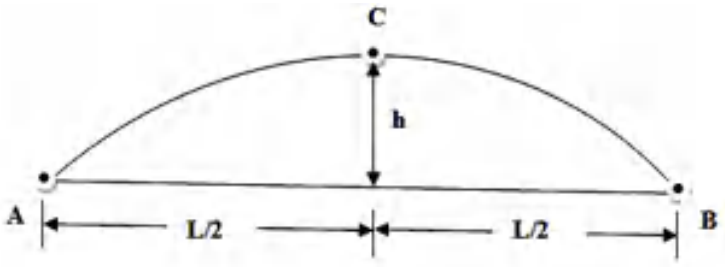
    b) A 500 N body moves along the two inclines for which the coefficient of friction is 0.2. If the body starts from rest at A and slides 60 m down the 30° incline as shown in figure, how far will it then move along the other incline? What will be its velocity when it returns to B? Use work energy method. (8M)



(OR)

11. a) A flywheel weighing 50 kN and having radius of gyration 1 m loses it speed from 400 rpm to 280 rpm in 2 minutes. Calculate the retarding torque acting on it. (4M)

    b) An automobile of weight 'W' travels with uniform speed 'v' over a curve ACB which is parabolic ($x^2 = ky$) as shown in figure. Determine the total pressure R exerted on the road by four wheel of an automobile as it passes the crest C if h = 1.2 m, L = 60 m and v = 96 kmph. (8M)



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