AR16

CODE: 16OE2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

WATER SHED MANAGEMENT

(Open Elective)

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? Explain Multi disciplinary approach for watershed management?	6 M
	b)	Explain detailed accounts on the following characteristics of a watershed (i) Land Use (ii) Socio economic (iii) Geology and soils (iv) Vegetation	8 M
		(OR)	
2.		Discuss the influence of the following characteristics of watershed in planning, implementing and its development? (i) Physiography (ii) Slope (iii) Hydrogeology (iv) Climate	14 M

UNIT-II

3.	a)	State that the types of soil erosion in a watershed and effects of erosion on land fertility	7 M
	b)	Explain the following soil erosion control measures in a watershed (i) Contour Bunding (ii) Water Absorption Trench (WAT) (iii) Staggered Trenches	7 M
		(OR)	
4.		Explain in detail how the following measures arrest the soil erosion in a watershed (i) Gully Control (ii) Rock fill Dams (iii) Gabion (iv) Trenching	14 M

UNIT-III

5.	a)	Explain it means by which you harvest rain water? Use neat sketches if where it's necessary	7 M
	b)	Discuss in detail about water harvesting structures?	7 M
		(OR)	
6.	a)	State that the soil moisture conservation through percolation tank and check dams	7 M
	b)	Explain the soil moisture conservation through artificial recharge techniques	7 M

UNIT-IV

7.	a)	Discuss in detail the land use and land capability classifications	7 M
	b)	Describe the management of Agriculture and Wild land in a watershed programme	7 M
		(OR)	
8.	a)	Explain the management of Forest land and Grass land in a watershed management	7 M
	b)	Describe the reasons for soils to turn into saline and alkaline soils and what are the steps to reclaim to normal state	7 M

UNIT-V

9.	a)	Explain the role of eco system in a watershed management	7 M
	b)	Discuss how dry land agriculture and horticulture are managed in an ecosystem	7 M
		(OR)	
10.	a)	Discuss about the strip, mixed and inter cropping pattern	7 M
	b)	Explain how the sustainable agriculture and bio - mass management managed in an ecosystem	7 M

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AR16

CODE: 16OE2013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

INTRODUCTION TO MATLAB

(Open Elective)

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 features and scope of MATLAB. 7M
   b) Write a short note on MATLAB desktop windows. 7M

(OR)

2. a) Write a short note on relational operators available in MATLAB with an example. 7M
   b) Write a short note on commands that are used for managing a session in MATLAB. 7M

UNIT-II

3. a) Write a short note on defining and reshaping of matrices in MATLAB. 8M
   b) Given that A=[7 4 3 2 8 9 6 1], B=[4 8 2 ;3 5 6; 8 4 1],C=[2;3;8],determine the results for following . 6M
      i. length(A)
      ii. A(:)
      iii. A(5)+B(3,2)
      iv. A(6)/C(2)
      v. length(C)*length(A)
      vi. B*C

(OR)

4. a) Write the syntax for function and explain 'nested function' with one example. 7M
   b) Write a function file to find mean value of set of numbers. 7M

UNIT-III

5. a) Write a script file to find maximum number in set of numbers using 'if-else' condition. 7M
   b) Write a short note on 'nested if' with an example. 7M

(OR)

6. Explain the 'loops' available in MATLAB with examples. 14M

CODE: 16OE2013 **SET-2**

UNIT-IV

7. a) Explain how to define axis properties in MATLAB with one simple example. 7M
   b) Give a simple code for plotting parabola y=2t^2 in the range of 0<t<10 7M

(OR)

8. a) Give the algorithm and code for solving following linear equations. 7M
   2x+3y+z=1
   x+2y+2z=2
   x+5y+4z=3
   b) Write a simple code for finding maxima and minima values for function 7M
   f(x)=(x^2)-2x+3.

UNIT-V

9. a) Write a short note on 'tools' available with Simulink. 6M
   b) Consider an object, falling towards the ground. A widely reported equation describing the resulting velocity is the differential equation **dv/dt=g-(c/m)(v^2)** where g is gravity is velocity, m is mass and c is drag coefficient. Design the Simulink model for given differential equation. 8M

(OR)

10. a) Write a short note on masking block/model in Simulink. 7M
    b) Briefly explain the conversion of mathematical model into Simulink model with one example. 7M

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AR16

CODE: 16OE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

MATRICESAND APPLICATIONS

(Open Elective)

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 $A = \begin{bmatrix} 5 & 3 & 14 \\ 0 & 1 & 2 \\ 1 & -1 & 2 \end{bmatrix}$ into Echelon form and determine its rank. 7M

   b) Show that the equations x-3y-8z = -10 ; 3x+y-4z =0 ; 2x+5y+6z = 13 are consistent and solve the same. 7M

(OR)

2. Reduce the matrix $A = \begin{bmatrix} 1 & 2 & 1 & 0 \\ -2 & 4 & 3 & 0 \\ 1 & 0 & 2 & -8 \end{bmatrix}$ to Normal form and determine its rank. 14M

UNIT-II

3. Determine the Eigen values and the corresponding Eigen vectors of the matrix 14M

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$$

(OR)

4. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$ also determine $A^{-1}$and A^4 14M

AR16

CODE: 16OE2011 **SET-2**

UNIT-III

5. Use LU decomposition to solve the system of equations 14M
2x+4y-6z= -4, x+5y+3z=10,x+3y+2z=5

(OR)

6. Solve the system of equations $3x + y + 2z = 3; 2x - 3y - z = -3;$ 14M
$x + 2y + z = 4$ by using matrix inversion method.

UNIT-IV

7. Show that the quadratic form $6x^2 + 17y^2 + 3z^2 - 20xy - 11yz + 8zx$ 14M
is positive semi –definite.

(OR)

8. Reduce the quadric form to the canonical form by an orthogonal reduction 14M
$6x^2 + 3y^2 + 3z^2 - 2yz + 4xz - 4xy$

UNIT-V

9. Write the matlab code to solve the linear system of equation 14M
$a_{11}x + a_{12}y + a_{13}z = b_1; a_{21}x + a_{22}y + a_{23}z = b_2; a_{31}x + a_{32}y + a_{33}z = b_3$.

(OR)

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

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AR16

CODE: 16OE2015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

INTRODUCTION TO ELECTRONIC MEASUREMENTS

(OPEN ELECTIVE)

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 following static performance characteristics i) sensitivity ii) Error iii) Expected value	7M
	b)	Draw and explain the DC ammeter?	7M
		(OR)	
2.	a)	Classify error, explain it and elimination methods	7M
	b)	Draw and explain the multi range DC voltmeter?	7M

UNIT-II

3.	a)	Draw and explain Wave Analyzer?	7M
	b)	Explain with neat sketch function Generator?	7M
		(OR)	
4.	a)	Explain with neat sketch AF sine generator?	7M
	b)	Draw and explain Harmonic distortion analyzer?	7M

UNIT-III

5.	a)	Write about CRT feature?	7M
	b)	Explain with neat sketch Digital storage oscilloscope?	7M
		(OR)	
6.	a)	Draw and explain the Block Diagram of CRO?	7M
	b)	Explain with neat sketch Dual beam oscilloscope?	7M

UNIT-IV

7.	a)	Draw and explain Wheatstone bridge for Measurement of resistance?	7M
	b)	A Wheatstone consist of Following values R_1=4kΩ, R_2=5kΩ R_3=100kΩ find unknown resistance R_x?	7M
		(OR)	
8.	a)	Draw and explain wien Bridge for Measurement of frequency?	7M
	b)	Draw and explain Anderson Bridge for Measurement of frequency?	7M

UNIT-V

9.	a)	Write short notes on thermistor?	7M
	b)	Explain with neat sketch Linear Variable Differential Transformer?	7M
		(OR)	
10.	a)	Define Transducer and classify different transducer with Examples?	7M
	b)	Explain with neat sketch Data acquisition systems?	7M

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AR16

CODE: 16OE2017 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

IT SYSTEMS MANAGEMENT

(Open Elective)

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.		Write about the services of Cloud Computing?	14M
		(OR)	
2.	a	How IT industry will handle Projects and Products?	7M
	b	Mention the key aspects of Application Software and System Software	7M

UNIT-II

3.	a	Mention the essence of PPT approach?(People-Process-Technology)	7M
	b	State the Design of IT Infrastructure	7M
		(OR)	
4.		Describe steps involved in IT Service Management	14M

UNIT-III

5.	a	List out the common tasks of ITSM	7M
	b	Narrate the role of Use case diagram in modelling	7M
		(OR)	
6.	a	Is e-Waste disposal is a burning issue to this planet, explain?	7M
	b	How Refactoring is helpful to IT industry?	7M

UNIT-IV

7		Explain the objectives of FCAPS	14M
		(OR)	
8.		List out the challenges of IT Managers?	14M

UNIT-V

9.	a	Write short notes on: Primary Memory Secondary Memory	7M
	b	How storage management will organized , explain?	7M
		(OR)	
10.		Briefly explain about Disaster Recovery	14M

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AR16

CODE: 16OE2014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

FUNDAMENTALS OF MATERIAL SCIENCE

(Open Elective)

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.	Classify materials and crystal imperfection and briefly explain line defects?	14M
	(OR)	
2.	Briefly explain about surface defects and volume defects?	14M

UNIT-II

3.	What are the mechanical properties required for materials and briefly explain about the deformation by slip?	14M
	(OR)	
4.	Explain about the mechanism of slip and twinning?	14M

UNIT-III

5.	What are advantages of hot working and cold working?	14M
	(OR)	
6.	Briefly explain about planar and dendritic growth?	14M

UNIT-IV

7.	Define hardness and briefly explain about rockwell hardness test?	14M
	(OR)	
8.	Define ductility and brittleness, Draw stress strain curve for ductile and brittle material and explain stress strain curve for mild steel?	14M

UNIT-V

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

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AR16

CODE: 16OE2016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October, 2017

UNIX UTILITIES

(Open Elective)

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	What an Operating System? Explain the functions of UNIX OS	7M
	b	Compare and Contrast UNIX and WINDOWS	7M
		(OR)	
2.	a	Draw the diagram of UNIX structure. Explain each component	7M
	b	Differentiate between System-V Vs. BSD	7M

UNIT-II

3.	a	What is the need for File system? Explain UNIX file system with neat diagram	7M
	b	Write short notes on vi editor	7M
		(OR)	
4.	a	Explain with examples file commands (i) cp (ii) mv (iii) rm (iv) cat	8M
	b	Explain any three commands related to vi editor	6M

UNIT-III

5.	a	What is a Shell? Write a shell script to copy the content from one file to another and remove the original file	8M
	b	What is the need for Electronic Mail? Explain with example	6M
		(OR)	
6.	a	What is a pipe? Give two examples of implementing pipes	8M
	b	Write short notes on **pine**	6M

UNIT-IV

7.	a	Explain the commands with examples (i) man (ii) join (iii) look	9M
	b	Write a shell script to find the number is a prime or not	5M
		(OR)	
8.	a	Explain the commands with examples (i) df (ii) head (iii) ls	9M
	b	Write a shell script to find the sum of 'n' numbers	5M

UNIT-V

9.	a	Explain with examples network related commands (i) finger (ii) telnet	8M
	b	Write short notes on X Windows	6M
		(OR)	
10.	a	Explain with examples network related commands (i) talk (ii) ftp	8M
	b	Write short notes on Window manager.	6M

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AR13

CODE: 13EC2003 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

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

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

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

PART-A

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

1. a) Implement the Boolean expression using NAND Gates ((A+B) C)'D
   b) Find the minimal SOP and POS expression for the following function
   F (A,B,C,D) = (1,4,5,6,11,12,13,14)
   c) Design a full adder using two half adders and logic gates
   d) Convert the following numbers $(225.225)_{10}$ = (x) 8
   e) Realize y=ab+ab'+b'c with basic gates
   f) How does an Ex-OR gate differ from an OR gate in its logical operation.
   g) Distinguish between decoder & demultiplexer.
   h) What is race condition in flip-flops? How it can be eliminated?
   i) Obtain the dual of A(A+B) & A(B.C).
   j) Distinguish between synchronous and asynchronous sequential circuits.

PART-B

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

UNIT-I

2. a) Determine the error in the received hamming code 110011. Consider even parity 6M
   b) Find the value of x in the following 6M
   i) $(4058.052)_{10} = (x)_{12}$ ii) $(10111.11)_2 = (x)_{16}$ iii) $(2512)_8 = (x)_2$

(OR)

3. a) Find the 1's and 2's complement of the following binary numbers. 6M
   i. 1011101101 ii) 011101110 iii) 10000111
   b) Find the 10's complement of $(539)_{11}$ and 9's complement of $(A8)_{16}$ 6M

UNIT-II

4. a) Find the simplified expression for the Boolean function 6M
   F(A,B,C,D)= ∑m (2,3,12,13,14,15)
   b) Implement the function F=AB'+CD'+AB'C+ABCD using universal gates 6M

(OR)

5. a) Implement the Boolean function F (A,B,C)=∑m(0,1,3,5) with NAND gates only. 6M

   b) Determine the canonical sum form for *f*(ABC)=C+($\bar{A}$+B)(A+$\bar{B}$). 6M

AR13

CODE: 13EC2003 **SET-1**

UNIT-III

6.	a)	What are the steps involved in simplification of Boolean function using Quine Mc-clusky method.	**6M**
	b)	Simplify using K- Map F(A,B, C, D)= ∑m(1,3,7,11,15)+d(0,2,5) and implement it with NAND gate	**6M**

(OR)

7.	a)	(a) Define the prime implicants and essential prime implicant minimize using tabular method, the given function f(w,x,y,z)= $\sum m$(1,4,8,9,13,14,15) + $\sum d$(2,3,11,12)	**7M**
	b)	Obtain the simplified expression in SOP and POS for the following Boolean expression $A\bar{B}+C\bar{D}+A\bar{B}C+ABCD$	**5M**

UNIT-IV

8.	a)	Design a combinational circuit that converts a four bit reflected code number to a four bit binary number	**6M**
	b)	Implement the following function with the multiplexer. F(A,B,C,D)= ∑m(0,1,3,4,8,9,15)	**6M**

(OR)

9.	a)	Design a combinational circuit that generates the 9's complement of a BCD digit .	**6M**
	b)	What is a priority Encoder. Design a 4 to 2 line priority encoder	**6M**

UNIT-V

10.	a)	What is a race around condition. Explain 2 solutions for overcoming race around conditions.	**8M**
	b)	What are the design steps of a synchronous counters.	**4M**

(OR)

11.	a)	Design a synchronous BCD counter using T flip- flop	**6M**
	b)	What are steps involved in the design of a ripple counter/ N-mod counter. And design modulus 10 ripple counter.	**6M**

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RA / AR13

SET-2

13ME1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October-2017
CLASSICAL MECHANICS
(Mechanical Engineering)

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

PART- A

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

1. a) Define Resultant?
   b) State converse of polygon law of forces.
   c) State Lami's theorem.
   d) What do you mean by statically determined truss?
   e) Define virtual displacement?
   f) Differentiate centroid and center of gravity
   g) State perpendicular axis theorem
   h) A body moves along a straight line so that its displacement from a fixed point on *t*he line is given by$s = 3t^2 + 2t$. Find *t*he velocity a*n*d acceleration at the end *o*f 3 seconds
   i) State D'Alemberts principle
   j) Write the relation between impulse and change in momentum.

PART- B

Answer one question from each unit **[5X12=60M]**

UNIT- I

2. a) Two forces are acting at a point O as shown in figure1. Determine the resultant in magnitude and direction. **[6M]**

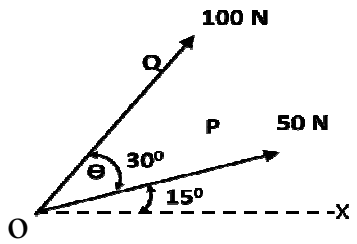

figure 1

   b) Determine the resultant of the following forces such that **[6M]**
      i .20kN force acting at an angle 30^0 through north east direction
      ii. 25kN force acting in north direction
      iii. 35kN force acting at an angle 40^0 through south west direction

(OR)

3. a) State Varignon's theorem. **[2M]**
   b) Two identical rollers each of weight 50 N, are supported by an inclined plane and a vertical wall as shown in figure2. Find the reactions at point of supports A,B,C . assume all surfaces to be smooth. **[10M]**

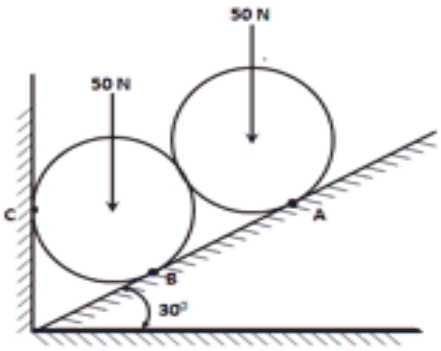

figure 2.

UNIT - II

4. Determine the forces in the truss shown in figure3 which carries horizontal load of 12 kN and vertical load of 18 kN. **[12M]**

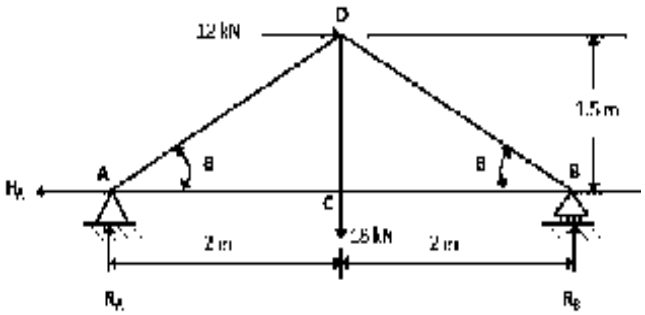

figure 3

(OR)

5. a) A Truss is loaded as shown in figure4 find by method of joints axial forces in each member of truss. **[6M]**

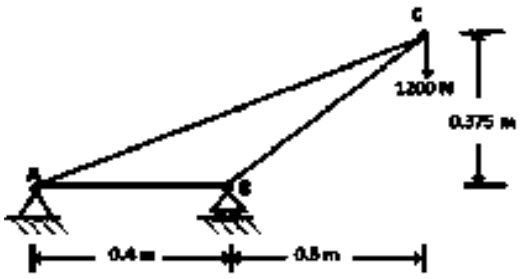

figure 4

b) Using the principle of virtual work, find the value of angle defining the configuration equilibrium of the system shown in figure5 below. The balls D & E can slide freely along the bars AC and BC but the string DE connecting them is inextensible. **[6M]**

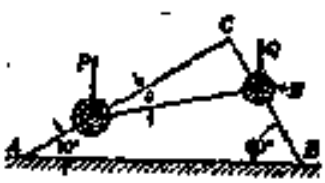

figure 5

UNIT – III

6. a) state and prove pappu's theorems. **[6M]**

   b) Locate the centriod of given section as shown in figure6 below. **[6M]**

   (all dimensions are in mm)

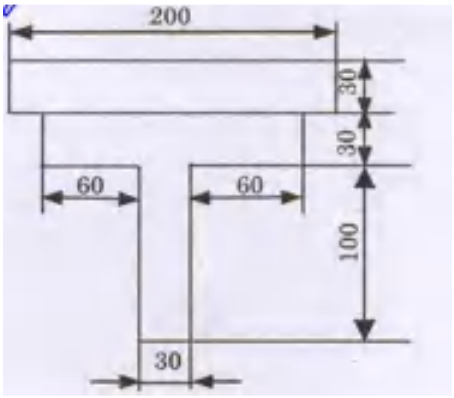

figure 6

(OR)

7.Calculate the Moment of Inertia of the shaded area about its centroidal axis in the figure7 shown below. (all dimensions are in mm) **[12M]**

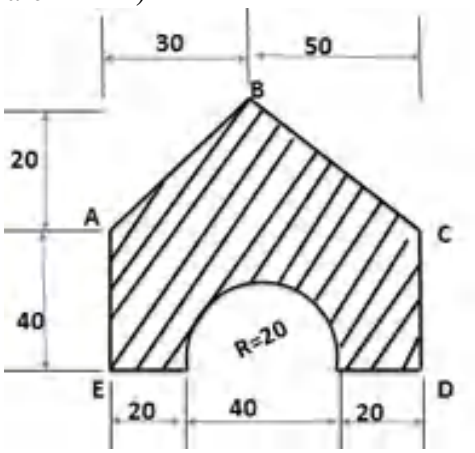

figure 7

UNIT– IV

8.a) A motorist is travelling at 80kmph,when he observes a traffic light 200m ahead of him turns red. The traffic light is timed to stay red for 10 seconds. If the motorist wishes to pass the light without stopping ,just as it turns green , determine the required uniform deceleration of the motor and speed of the motor as it passes the light. **[6M]**

b) Find the acceleration of the moving loads as shown in figure8. Take mass of P=120 kg and that of Q=80 Kg and coefficient of friction between surfaces of contact is 0.3. Also find the tension in the connecting string. **[6M]**

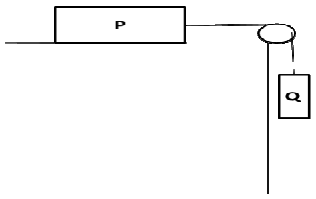

figure 8

(OR)

9. a) The velocity of a particle moving in a straight line is given by the expression $V = t^3-t^2-2t+2$ the particle is found to be at a distance of 4m from station A after 2seconds. Determine acceleration, displacement after 4seconds and maximum/minimum acceleration. **[6M]**

b) Determine the Tension in the strings and the velocity of 1500 N block shown in figure95seconds after starting and when it is in rest and starting with downward velocity of 3m/sec assume pulleys are weightless and frictionless. **[6M]**

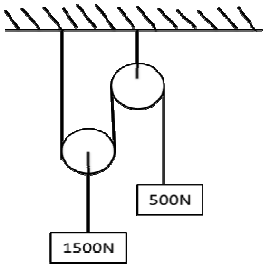

figure 9

UNIT - V

10.a) A Projectile is fired with initial velocity of 250m/sec at a target located at horizontal distance of 4km and vertical distance of 700m above the gun. Determine the firing angle to hit the target. Neglect air resistance. **[4M]**

b) A 3000N block starting from rest as shown in figure10 slides down a 50^0 inlcine. **[8M]** After moving 2meters it strikes a spring whose modulus is 20N/mm .with coefficient of friction between the block and incline is 0.2 .Determine the maximum deformation of the spring and maximum velocity of the block.

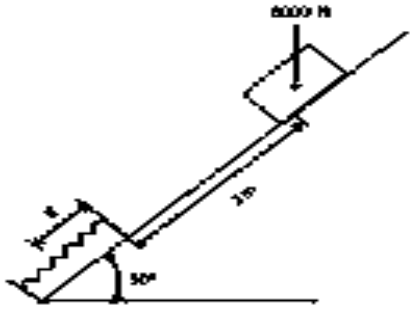

figure 10

(OR)

11.a) Derive work energy equation for translation. **[4M]**

b) A man of mass 75kg and boy of 25kg dive off the end of a boat so that relative horizontal velocity with respect to the boat is 3m/sec. If initially the boat is at rest find the final velocity if the two dive off simultaneously and the man dives first followed by the boy. **[8M]**

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