CODE: 18EST103   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular/Supplementary Examinations, November-2020

ENGINEERING MECHANICS
(Civil Engineering)

Time: 3 Hours   Max Marks: 60

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) Explain the classification of forces with examples   6M
   b) Three forces of 2P, 3P and 4P act along the three sides of an   6M
      equilateral triangle of side 100 mm taken in order. Find the
      magnitude and position of the resultant force.
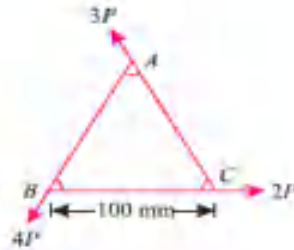
(OR)

2. a) List out the different methods to calculate resultant of a   6M
      coplanar concurrent system with an example.
   b) Determine the *x* and *y* components of each of the forces as   6M
      shown in Figure.2
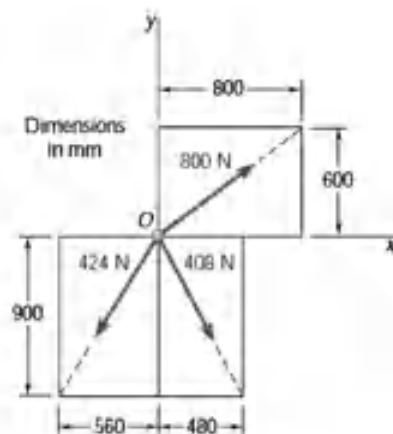
Figure.2

3. a) Differentiate between moment and couple with an example.   3M
   b) Two identical rollers of each weight Q= 100 N are supported   9M
      by a vertical wall and an inclined plane as shown in Figure.
      Determine the reactions at the point of supports A, B and C.
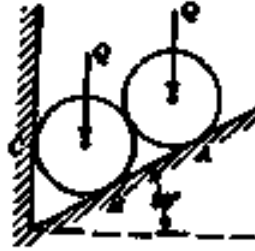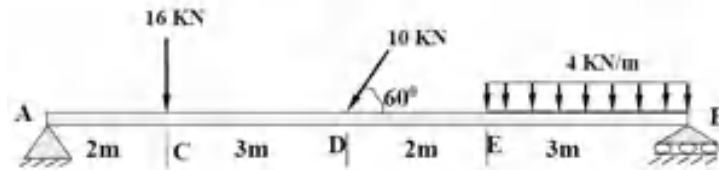

Figure.3

(OR)

4. a) Show that if three coplaner forces, acting at a point be in   3M
      equilibrium, then, each force is proportional to the sine of the
      angle between the other two.

   b) Determine the reactions at supports for the beam shown in   9M
      fig.

UNIT-III

5. a) Define angle of repose and cone of friction   3M
   b) A body of weight 200 N is placed on a rough horizontal   9M
      plane. If the coefficient of friction between the body and
      horizontal plane is 0.3, determine i) Horizontal force required
      to impend motion. ii) Pull at an angle 30^0 to horizontal
      required to impend motion.

(OR)

6. a) Explain the assumptions made for determining the forces in   3M
      trusses.

b) Compute the force in each member of the truss using method of joints as shown in Figure.　　9M
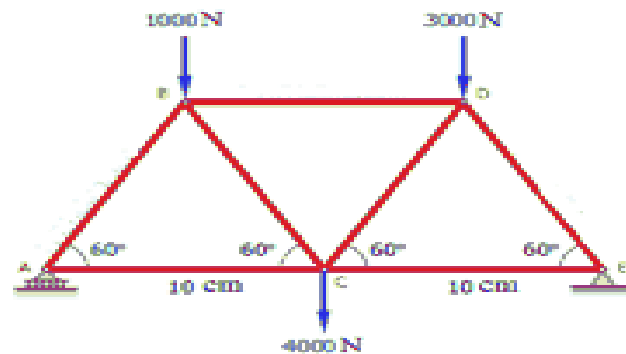
7. a) Determine the centroid of rectangle having base b and height h.　　6M

   b) Determine the centroid of Z – section shown　　6M
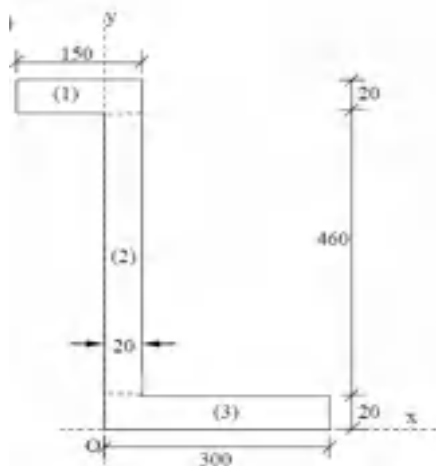
(OR)

8. a) Determine the moment of inertia of rectangular area about its centroid　　6M

   b) Find the M.I of following T-Section about centroidal horizontal and vertical axes　　6M

9. a) Find the height of the tower from top of which an object 6M falls freely and during the last second of its motion ,the object travels a distance is equal to 2/3 of height of the tower . Assume g =9.81 m/sec^2
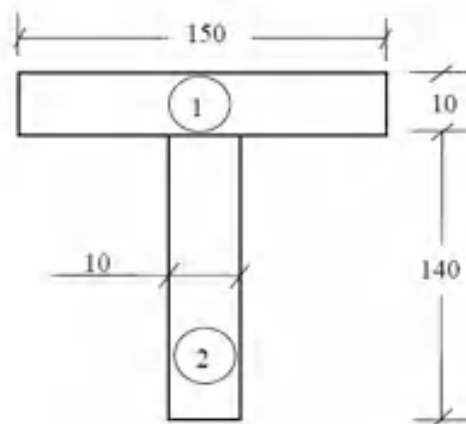
   b) The rotation of a fly wheel is governed by the equation $\omega = 3t^2 - 2t + 2$ where ω is radian per second and 't' is in seconds after one second from start the angular displacement was 4 radians. Determine the angular displacement, angular velocity and angular acceleration of the flywheel when t = 3 sec. 6M

(OR)

10. Two blocks A and B slide under the action of gravity slide 12M down the inclined plane CD that makes with the horizontal the angle $\alpha=30^0$ as shown in Figure.8. If the weights of the blocks are W_a =44.5N and W_b= 89N and the coefficients of friction between them and the inclined plane are μ_a= 0.15 and μ_b= 0.30, find the pressure P existing between the blocks during the motion.
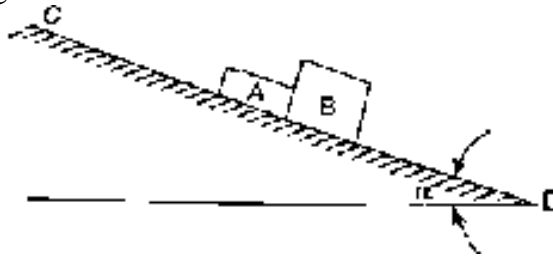
Figure.8

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CODE: 18EST102   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular/Supplementary Examinations, November-2020
PROGRAMMING FOR PROBLEM SOLVING
(Common to EEE, ME Branches)

Time: 3 Hours   **Max Marks: 60**

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)	Describe a Flowchart? Show the symbols used in a flow chart with an example each. Draw a flowchart for check the given number is Prime or not.	6M
	b)	Classify tokens in C and explain each with an example.	6M

(OR)

2.	a)	Explain all bitwise operators with suitable examples.	6M
	b)	What are the program development steps in C? Explain each.	6M

UNIT-II

3.	a)	Explain switch statement with a suitable example.	6M
	b)	Differentiate entry controlled and exit controlled loops with suitable examples.	6M

(OR)

4.	a)	Explain nested if statement with a suitable example.	6M
	b)	Write a C program to reverse the given number and check whether it is a palindrome or not	6M

UNIT-III

5.	a)	Explain integer 1D array with suitable example code snippets illustrating declaring, initializing and accessing of the array.	6M
	b)	Write a C program to print largest and smallest element in an array.	6M

(OR)

6.	a)	Write a recursive function to print Fibonacci series up to 'N'	6M
	b)	What are the types of functions based on parameters and return values? Explain all with proper syntaxes.	6M

UNIT-IV

7.	a)	Write about Pointer to Pointer concept with suitable examples	6M
	b)	What are the advantages of dynamic memory allocation? Write sample code to create memory dynamically.	6M

(OR)

|			
8.	a)	Show how pointer arithmetic can be performed with suitable example.	6M
	b)	Write a C program to allocate memory dynamically for a 1D array and use realloc() to change the size of the array.	6M

UNIT-V

9.	a)	Write a C program to read five students marks and find the average by using array of structures.	6M
	b)	Differentiate text and binary files.	6M

(OR)

10.	a)	Explain nested structure with a suitable example.	6M
	b)	Write short note on pre-processor directives	6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular/Supplementary Examinations, November-2020
NETWORK THEORY
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 60

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) State and explain Kirchhoff's laws?   5M
   b) Using mesh analysis find all branch currents for the following   7M
      circuit

(OR)

a) State and explain Norton's theorem?   5M
b) Find branch currents for the following circuit   7M

UNIT-II

3. a) State and explain Compensation theorem?   5M
   b) Verify the reciprocity theorem for the network shown in fig .   7M

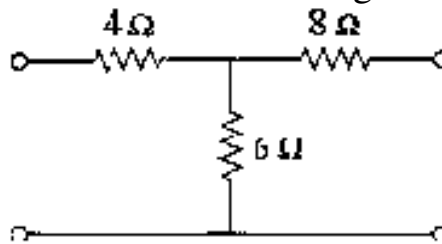4. a) State and explain Substitution theorem   5M
   b) Verify Milliman's Theorem for the given circuit   5M
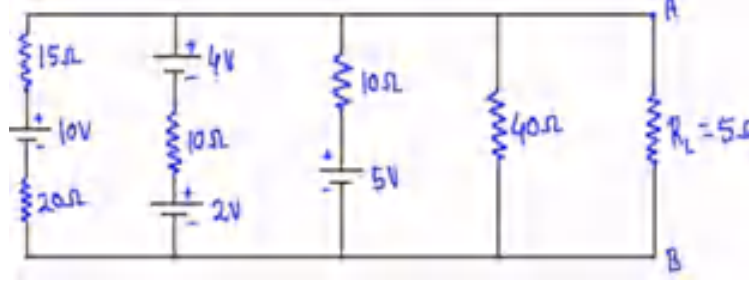
UNIT-III

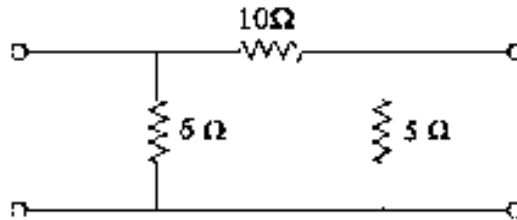5. a) Find the h- parameters for the following circuit.   7M

   b) Find the relationship between Z and h parameters   5M

(OR)

6.   Find the ABCD and h - parameters for the following circuit   12M

UNIT-IV

7.   Obtain the expression for resonant frequency, bandwidth and   12M
      Q-factor for parallel R-L-C circuit.

(OR)

8.   Show that the resonant frequency $fr^2 = f1f2$ where f1 and f2   12M
      are the half power frequencies and fr is the resonant
      frequency.

9. The switch has been closed for long time at a .At t>0,the switch is switched to b, what is the voltage across the capacitor Vc(t)   12M
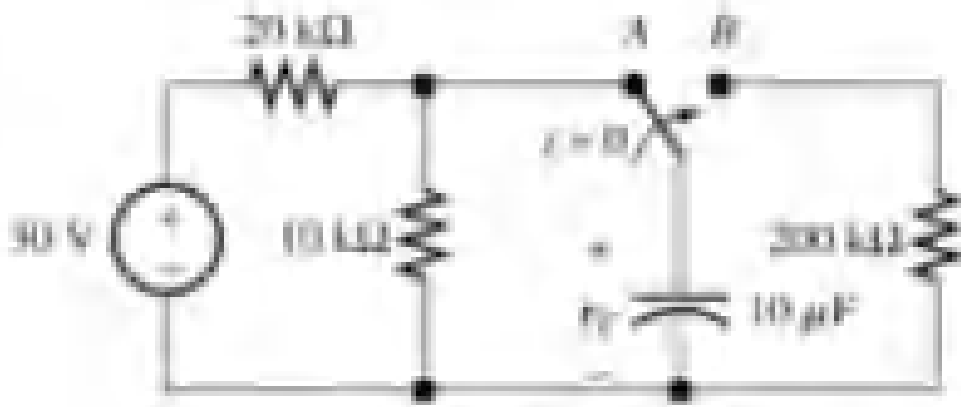
(OR)

10. The switch has been closed for long time .At t=0,the switch is opened, what is the voltage across the capacitor Vc(t)   12M

3 of 3

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