13ME1003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B. Tech I Semester Regular / Supplementary Examinations, December, 2015
ENGINEERING MECHANICS
(Common to EEE & ECE)

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

PART- A

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

1. (a) Differentiate between resolution and composition of forces.
   (b) Define moment and moment of force.
   (c) The conditions of equilibrium for coplanar and non concurrent forces are ----
   (d) Forces whose lines of action pass through a common point are called ---forces
   (e) What is cone of friction?
   (f) When a plane area is rotated about a fixed axis,---------- gets generated.
   (g) Define the term radius of gyration.
   (h) State the transfer formula for product of inertia.
   (i) State D'Alembert's principle.
   (j) What do you mean by fixed axis rotation ?.

PART-B

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

UNIT-I

2.Determine the resultant, both in magnitude and direction, of the four forces acting on the body as shown in Fig.1 (12M)

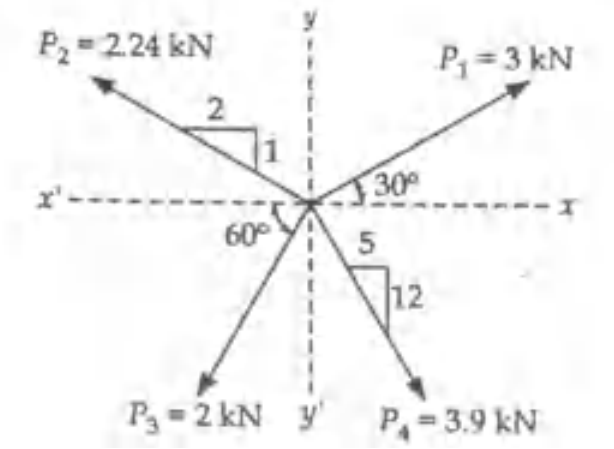

Fig.1

(OR)

3.(a) State and prove the Parallelogram law. (6M)
(b) Discuss graphical and analytical methods for finding resultant of several coplanar concurrent forces. (6M)

13ME1003

UNIT-II

4. Two smooth spheres P,Q each of radius 25 cm and weighing 500 N, rest in a horizontal channel having vertical walls as shown in Fig.2.If the distance between the walls is 90 cm. Calculate the reactions at points of contact A,B and C. (12 M)

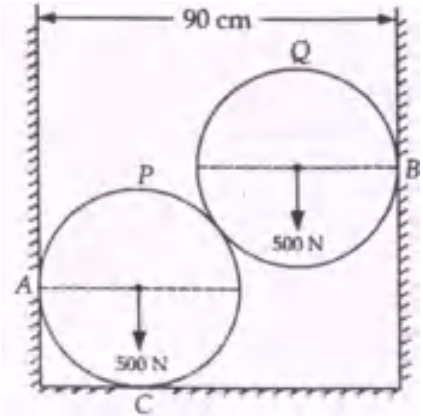

Fig.2

(OR)

5. A plate measuring 6 mX4 m is acted upon by a set of forces in its plane is as shown in Fig.3.Determine the magnitude, direction and position of the resultant force. (12M)

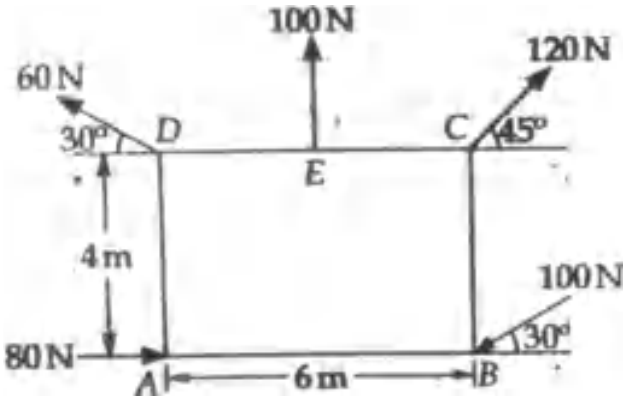

Fig.3

UNIT-III

6. Two identical blocks A and B are connected by a rod and rest respectively against vertical wall and horizontal floor as shown in Fig.4. The sliding motion of the block impends when rod makes an angle of 45^0 with the horizontal. Calculate the coefficient of friction assuming it to be same both at the floor and wall. (12M)

13ME1003

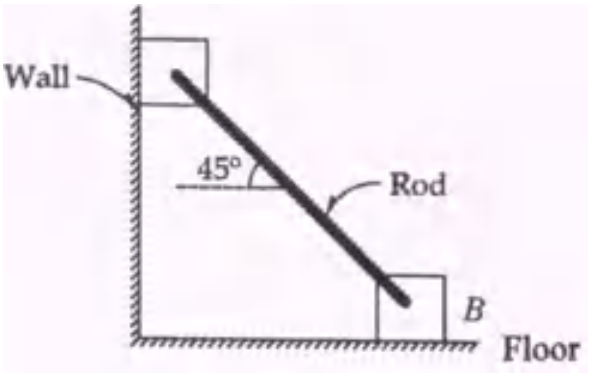

Fig.4

(OR)

7. Locate the Centroid of the shaded area bounded by a straight line and a parabola as shown in Fig.5. (12M)

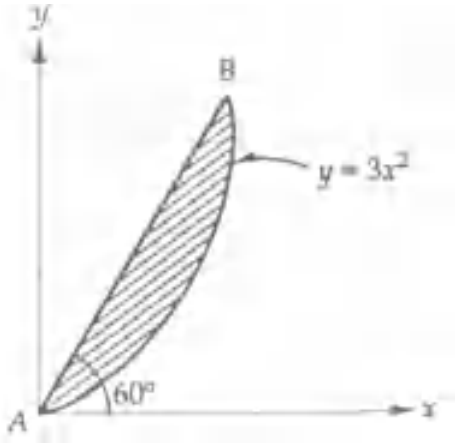

Fig.5

UNIT-IV

8. Determine I_{xx} and I_{yy} of the cross-section of a cast iron beam as shown in Fig.6. (12M)

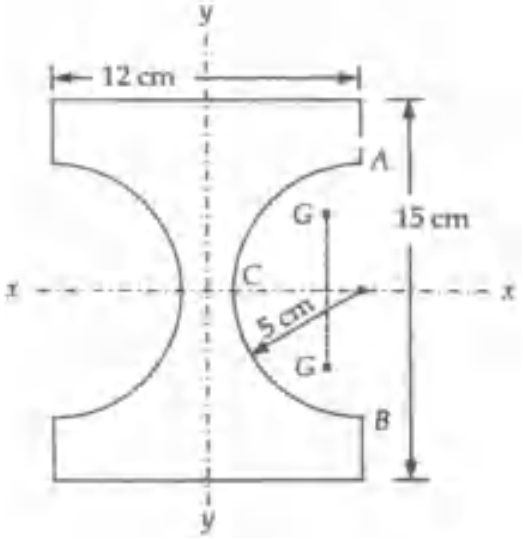

Fig.6

13ME1003

(OR)

9. Derive the expression for the mass moment of inertia of a solid right circular cone. (12M)

UNIT-V

10. Two blocks of mass 60 Kg and 15 Kg are connected by a string and move along a rough horizontal surface when a force of 300 N is applied to the block of 60 Kg mass as shown in Fig.7.Apply D'Alemberts principle to determine the acceleration of the blocks and tension in the string. Assume coefficient of friction between the sliding surface of the blocks and the plane is 0.25. (12M)

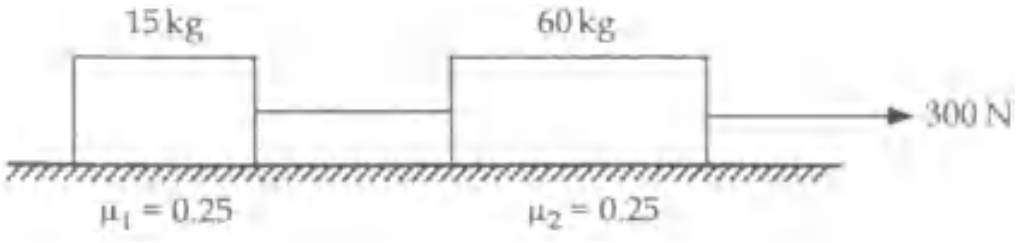

Fig.7

(OR)

11.Two blocks of masses m_1 = 25 Kg and m_2 = 20Kg are connected by a light inextensible string which passes over a 25 cm diameter pulley of 2.5 Kg mass as shown in Fig.8.Neglecting friction, Calculate the acceleration of the system and the tension in the string when the masses are released from rest. Assume radius of gyration of the pulley to be equal to its radius. (12M)

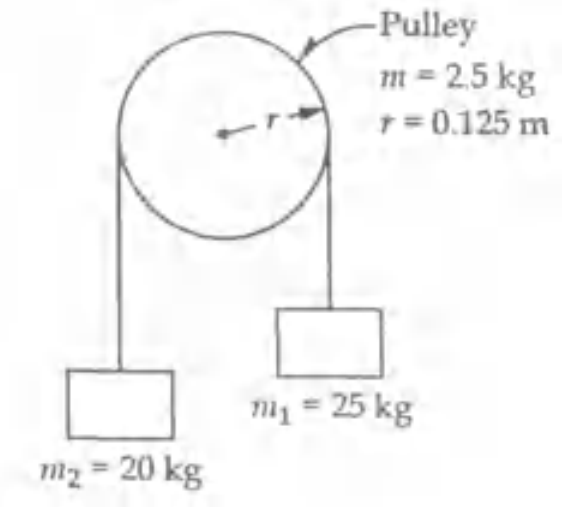

Fig.8

***

AR13

Code: 13CS1001 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B. Tech I Semester Regular/ Supplementary Examinations, December, 2015

COMPUTER PROGRAMMING
(CE, ME, CSE & IT)

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

PART-A

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

1. a) What is meant by recursion.
   b) How does a structure differ from union?
   c) How can a function return an array to its calling routine?
   d) What is ternary operator and write an example.
   e) What is the purpose of **continue** statement?
   f) What is a pre-processor directive? Give two examples.
   g) What is the difference between reading a string with scanf() function and gets() function?
   h)Define an algorithm? Write few properties of an algorithm.
   i) What is the output of the following C program?

```
void main ()
{ int x=4,y=0,z;
while(x>=0)
{
   x--;
  y++;
if(x==y)
continue;
else
printf("\nx:%d y:%d",x,y);
}
}
```

   j) What is a pointer? Write few applications of pointers?

PART-B

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

UNIT-I

2. a) Define a flow chart ? Draw the flow chart for finding whether the given number is prime number or not and write a c program for that.
   b) Explain in detail about frame work for problem solving. [6M+6M]

(OR)

3. a) Explain in detail about the various data types in C language.
   b) Explain about unary and relational operators with example programs. [6M+6M]

AR13

Code: 13CS1001 **SET-1**

UNIT-II

4. a) Explain about for, while, do-while loop control structures with its syntax, flow charts and examples,.
   b) Write a program to add first ten terms of the following series using a **for** loop:
   $1^2+2^2+3^2+4^2+$ ..... [6M+6M]

(OR)

5. a) Write a C Program to produce the following output using nested loops.

```
   1
  2  3
 4  5  6
7  8  9  10
```

   b. Explain about switch statement with syntax and flow chart .Write program that illustrates all arithmetic operations using switch statement. [6M+6M]

UNIT-III

6. a) What is an array? Write a program to find the sum of diagonals of a square matrix?
   b) Define a string. Write a program for calculating string length and string concatenation without using string library functions.
   [6M+6M]

(OR)

7. a) Explain parameter passing techniques with example programs.
   b) What is the use of storage class? Write about all storage classes with examples?
   [6M+6M]

UNIT-IV

8. Explain in detail about definition, declaration and initialization of a structure? Define a structure called student with fields name, roll no, marks and write a program for creating the details of 10 students and sort them according to their percentage.
   [12M]

(OR)

9. a) Write a 'C' program to illustrate the use of command line arguments.
   b) Describe various dynamic allocation and de-allocation functions with examples.
   [6M+6M]

UNIT- V

10. a) Define a file and elaborately discuss about reading, opening and closing of a file.
    b) Write program to create a file with some textual information and display every third character in a file. [4M+8M]

(OR)

11. a) Write a program to copy the contents of one file to another.
    b) Write a program to count the number of vowels and spaces in a file. [6M+6M]

***