AR13 **SET-01**

Code: 13ME1003

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
1 B.Tech 1 Semester Regular Examinations, FEBRUARY- 2014
ENGINEERING MECHANICS
(Common to EEE & ECE)

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

Part – A

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

1

a) What are equations of equilibrium?
b) What is a free body diagram?
c) State the principle of superposition.
d) Define couple.
e) What is the difference between center of gravity and centroid?
f) What is angle of friction?
g) Define area moment of inertia.
h) State D' Alembert's principle.
i) What are normal and tangential components of acceleration?
j) State the Work - Energy principle.

Part-B

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

Unit-1

2. a. What are the different methods to find resultant of several coplanar concurrent forces?
b. State and prove the parallelogram law.

(OR)

3. Find the resultant of the coplanar concurrent forces acting at the point 'O' as shown in fig.1.

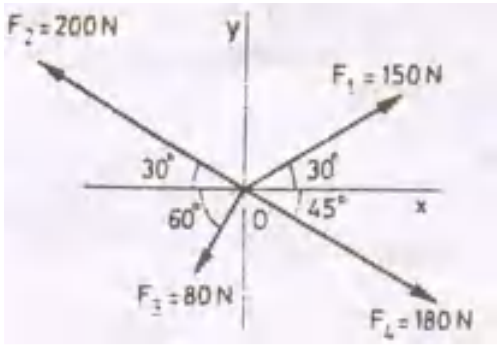

Fig.1

Unit-2

4. A uniform wheel of 60cm diameter weighing 1000N rests against a rectangular obstacle 15cm high. Find the least force required which when acting through the center of the wheel will just turn the wheel over the corner of the block. Also, find the angle θ which this least force shall make with AC.(fig.2)

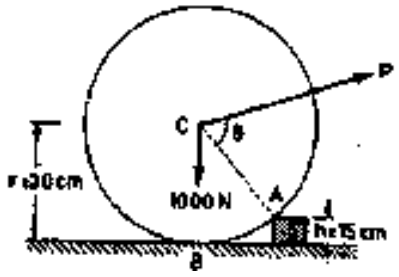

Fig.2

(OR)

5. A bar 2m long and of negligible weight rests in horizontal position on two smooth inclined planes as shown in fig.3. Determine the distance x at which the load Q = 100N should be placed from point B to keep the bar horizontal.

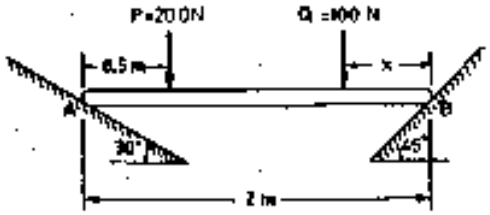

Fig.3

Unit-3

6. Two blocks A & B are resting against a wall & the floor as shown in the fig. 4. Find the value of the horizontal force, P applied to the lower block that will hold the system in equilibrium. Coefficients of friction are 0.25 at the floor, 0.3 at the wall & 0.2 between the blocks.

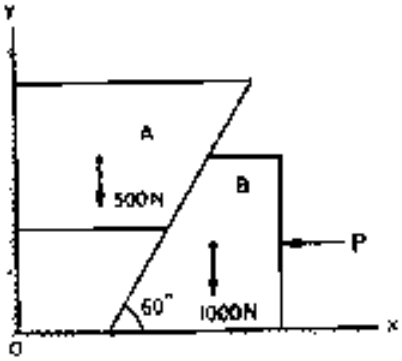

Fig.4

(OR)

7. Determine by direct integration the coordinates of the centroid of the shaded area formed by the intersection of a straight line and the curve $y = kx^2$ as shown in fig.5.

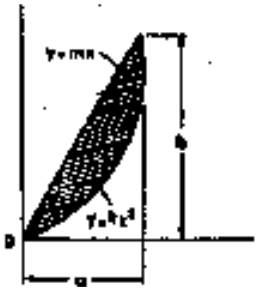

Fig.5

Unit-4

8. What is radius of gyration? From the first principles determine the moment inertia of a rectangle about the centroidal x-axis and centroidal y-axis

(OR)

9. Find the moment of inertia of the composite area about its centroidal parallel to x-axis as shown in fig.6.

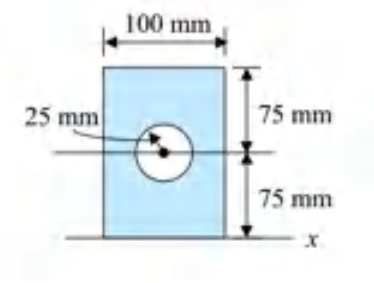

Fig.6

Unit-5

10. a) A stone is dropped into well and the sound of splash is heard after 4 seconds. Assuming the velocity of sound to be of 350 m/s find the depth of the well.

b) A body is thrown vertically up. It was found to travel a distance of 5.0 m during its 3rd second of the travel. Find the initial velocity with which the body is thrown up.

(OR)

11. Two blocks A & B are held on a inclined plane 5 m apart as shown in fig.7. The coefficients of friction between the blocks A, B and the inclined plane are 0.2 & 0.1 respectively. If the blocks begin to slide down the plane simultaneously, calculate the time & distance travelled by each block before collision.

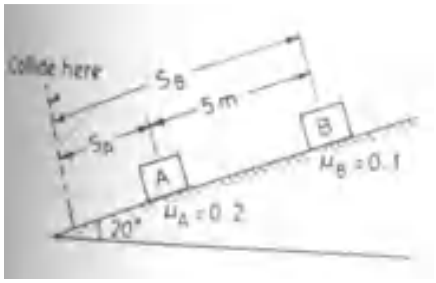

Fig.7

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AR13 SET-01

Code:13CS1001

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Regular Examinations, February – 2014
COMPUTER PROGRAMMING
(Common to CE, ME, CSE & IT Branches)

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

PART – A

Answer all questions **[10X1=10M]**

1. a) Define flowchart
   b) List out the primary data types in C
   c) Write the general form of conditional operator
   d) Write the general form of simple if statement
   e) What are actual parameters
   f) Define Recursion
   g) Define an Array
   h) List out various storage classes in C
   i) Write the operation of putw( ) function
   j) What will be the output of the following program

```
main()
{
int i;
for(i=1;100;i++)
printf("i=%d",i);
}
```

PART-B

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

Unit-I

2) a) Write about constants in C
   b) Write an algorithm, draw the flow chart and write a C program to convert given temperature in Fahrenheit to Celsius using the following conversion formula: C=(F-32)/1.8

(OR)

3) a) Write about relational operators in C with suitable examples
   b) Define Algorithm. Write the properties of Algorithms. Write an algorithm to calculate area of a rectangle using the formula area=length x breadth

UNIT-II

4) a) Write about else if ladder with its general form ,flow chart and with a suitable example.

b) Write a C program which reads the marks of a student and prints appropriate grade based on the following criteria

marks	grade
80 to 100	Honours
60 to 79	First Division
50 to 59	Second Division
40 to 49	Third Division
0 to 39	Fail

Use else if ladder.

(OR)

5) a) Write the general form of for loop. Write a C program to print the following output using for loop.

```
1
2  2
3  3  3
4  4  4  4
5  5  5  5  5
```

b) Write the general form of while loop. Write a C program to evaluate sum of first n natural numbers using while loop.

UNIT – III

6) a) Write about passing Two-Dimensional array to functions with suitable example.
b) Write about storage classes in C.

(OR)

7) a) Write about declaration and accessing of 1-Dimensional arrays with suitable example.
b) Write about parameter passing with suitable examples.

UNIT – IV

8) a) Write about declaration and initialization of pointer variables with suitable examples.
b) Write about string handling using pointers with suitable examples.

(OR)

9) a) Write about Bit fields with suitable examples
b) Write about Arrays of structures with suitable examples

UNIT – V

10) Write about input and output operations on files with suitable examples

(OR)

11) Write a C program to copy the contents of one file into another

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