Code No: R161107 **R16** SET - 1

I B. Tech I Semester Supplementary Examinations, April- 2022

COMPUTER PROGRAMMING

(Com to ECE, Aero E, Auto E, Bio-Tech. Chem. E, CE, CSE, IT, EIE, EEE, ME, Metal E, Min E, PChem. E, PE, ECom. E)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

PART –A

1. a) Define Application software. (2M)
   b) List any four Mathematical Library Functions. (2M)
   c) Write the syntax of if-else Statement. (2M)
   d) Write any four features of modular programming. (2M)
   e) Define an array. (2M)
   f) What are the various derived data types available? (2M)
   g) List various modes of opening a file. (2M)

PART –B

2. a) Discuss the features of the high-level languages with suitable examples. (7M)
   b) Write an algorithm to compute the sum of first n numbers. (7M)
3. a) Discuss various Data Types and Arithmetic Operations in detail. (7M)
   b) Explain how Operator Precedence and associativity applied in C with an example. (7M)
4. a) Write a C program to demonstrate the use of Switch-Case. (7M)
   b) Write a C program to compute the factorial of a given number using the While loop. (7M)
5. a) Discuss the importance of storage class, local variable storage class, and global variable storage classes with suitable examples. (7M)
   b) Write a C program to print the Fibonacci series using Recursion. (7M)
6. a) Write a C program to find the biggest number in a given array. (7M)
   b) Write a C program to compute the reverse of any given string. (7M)
7. a) List and explain various file functions available in C. (7M)
   b) Compare and contrast structure with union with suitable examples. (7M)

Code No: R161213 **R16** SET - 1

I B. Tech II Semester Supplementary Examinations, November - 2021

DATA STRUCTURES

(Com. to ECE, EIE, E Com)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

PART –A

1. a) What are the properties of sparse matrix? (2M)
   b) Convert following infix expression into postfix expression: A+B^(C-D)+E/F+G. (2M)
   c) What are the advantages of using a linked list rather than array? (2M)
   d) What are the features of a threaded binary tree? (2M)
   e) What is the need of balanced binary trees? (2M)
   f) State the scenario under which insertion sort should be used. (2M)
   g) Define in-degree and out-degree of a graph. (2M)

PART -B

2. a) With an example explain polynomial addition using arrays. (6M)
   b) Discuss about transpose of a sparse matrix with an example. Also write a function for its implementation. (8M)
3. a) Write the algorithm for evaluating a postfix expression using stack. Evaluate the following postfix notation 5 6 2 + * 8 4 / - (7M)
   b) Explain the operations of Queue with an example. (7M)
4. a) Write an algorithm to delete duplicates in a linked list and explain with example. (7M)
   b) Write a c program for the implementation of circular linked list. (7M)
5. a) What is a binary tree? Construct a binary tree given the pre-order traversal and in-order traversals as follows: (7M)
   Pre-Order Traversal: G B Q A C K F P D E R H
   In-Order Traversal: Q B K C F A G P E D H R
   b) Create max heap for the following elements 33, 14, 65, 02, 76, 69, 59, 85, 47, 99, 98. (7M)
6. a) Does the minimal spanning tree of a graph give the shortest distance between any two specified nodes? Justify your answer. (7M)
   b) Differentiate between the DFS and BFS graph traversal techniques. (7M)
7. Discuss Heap sort algorithm. Create Heap for the following elements and then sort them. (13, 102, 405, 136, 15, 105, 390, 432, 28, 444). (14M)

Code No: R161216 **R16** SET - 1

I B. Tech II Semester Supplementary Examinations, November -2021

ENGINEERING MECHANICS

(Com. to CSE, IT, Agri. E)

Time: 3 hours Max. Marks: 70

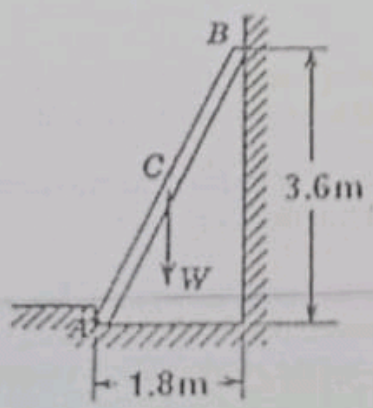
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

PART –A

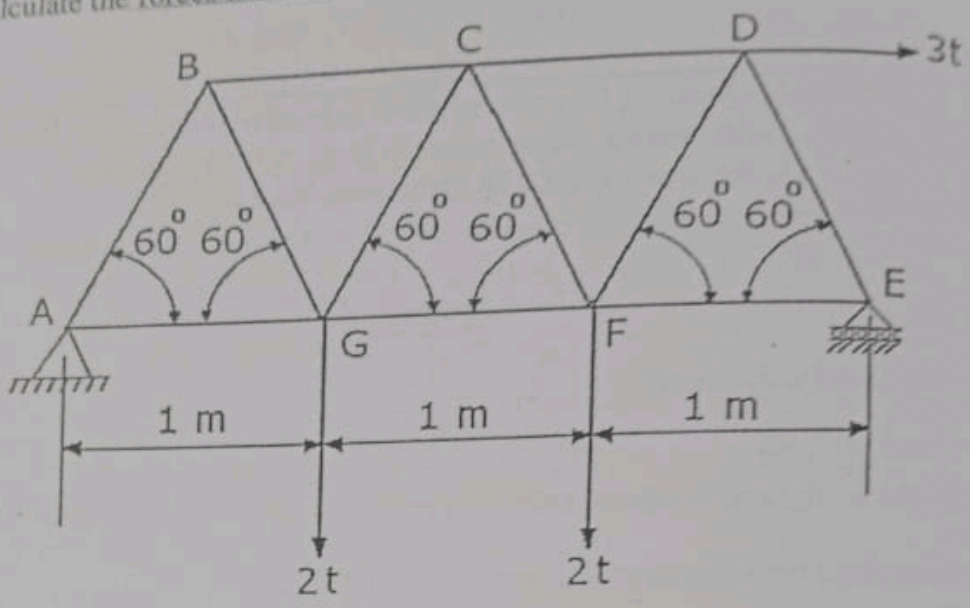
1. a) Define Lami's theorem. (2M)
   b) Define a couple. (2M)
   c) State the analytical conditions for the equilibrium of coplanar forces in a plane. (2M)
   d) Differentiate between centriod and centre of gravity. (2M)
   e) Give a brief note on Transfer theorem. (2M)
   f) Mention the applications of work-energy method. (2M)
   g) Define law of conservation of angular momentum. (2M)

PART -B

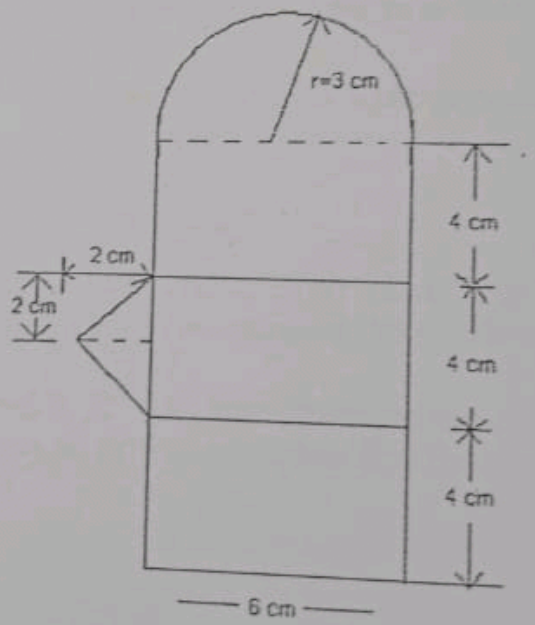
2. a) Two forces equal to 2P and P respectively act on a particle. If first be doubled and the second increased by 12N the direction of the resultant is unaltered, find the value of 'P'? (7M)
   b) A 675 N man stands on the middle rung of a 225 N ladder, as shown in Figure Assuming a smooth wall at B and a stop at A to prevent slipping, find the reactions at A and B. (7M)



3. Calculate the forces induced in the member of a pin-jointed truss shown in figure



4. Find the centroid of the area shown figure



5. a) Show that the moment of inertia of a thin circular ring of mass 'M' and mean radius 'R' with respect to its geometric axis is MR^2.

   b) Find out the mass moment of inertia of a right circular cone of base radius 'R' and mass 'M' about the axis of the cone

6. a) The motion of the particle is defined by the relation $x = 6t^4 + 8t^3 - 14t^2 - 10t + 16$. where x and t are expressed in meters and records, respectively. Determine the position, the velocity, and the acceleration as the particle when $t = 3s$.

b) A car is tested for acceleration and braking. In the street - start acceleration test, the elapsed time is 8 seconds for a velocity increase from 8 km/h to 80 km /h. In the braking test, the distance traveled is 40m during braking to a stop from 80 km / hr. Assuming constant values of acceleration and deceleration, determine (7M)

i. the acceleration during the street - start test

ii. the deceleration during the braking test

7. With a suitable example, explain Impulse momentum method. (14M)