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MATHEMATICS

( Major )

Paper : 6.3

( **Computer Programming in C** )

*Full Marks : 40*

*Time : 2 hours*

*The figures in the margin indicate full marks  
for the questions*

1. Answer as directed (any six) :

1×6=6

- (a) What is the utility of a compiler?
- (b) What is meant by a source program?
- (c) Mention any two operating systems commonly used.
- (d) Give an example of volatile memory.
- (e) Mention the main hardware components of a computer.

(f) What is meant by an application software?

(g) What is an algorithm?

(h) State True or False :

C is a case-sensitive language.

2. Answer any *four* questions :

1×4=4

(a) What is meant by an identifier?

(b) Mention four reserved words used in C.

(c) Mention four basic data types used in C.

(d) What are relational operators? Give two examples.

(e) Write the following mathematical equation in C expression :

$$\sin\left(\frac{y}{\sqrt{x^2 + y^2}}\right)$$

(f) What is the utility of a size of operator?

3. Answer any *two* parts :

5×2=10

(a) Write the general form of nested if-else statement. Use it in a program which can be used to find the biggest of 3 given distinct integers.

(b) Give the general syntax of switch statement and explain in detail how it works with the help of a program segment.

(c) Write a C program to check whether a given number is a prime number.

4. Answer any *two* parts : 5×2=10

(a) What is an array variable? How does it differ from an ordinary variable? Explain how you can declare, initialize and use an array of 10 integers.

(b) Write a program in C to find the multiplication of two 3×3 given matrices.

(c) Write a C program to find the sum of two values using pointer. Also explain how pointers differ from an ordinary variable.

5. Answer any *two* parts : 5×2=10

(a) Write a function to find the factorial of a given integer and use it to find the value of  ${}^n C_r$ , where

$${}^n C_r = \frac{n!}{r!(n-r)!}$$

- (b) What is meant by a recursive function?  
Write a recursive function for computing  
the value of  $x^n$  for given values of  $x$  and  $n$ .
- (c) Write short notes on (any two) :
- (i) Auto-storage class
  - (ii) Static storage class
  - (iii) Extern storage class

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