

(01/13-II)

2353

B.C.A. (First Year)/Diploma in Computer

Application EXAMINATION

(New Scheme)

PROGRAMMING FUNDAMENTAL USING C

BCA/DCA-103

Time : Three Hours

Maximum Marks : 70

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) What is a flowchart ? How is it better than algorithm ? Discuss various merits and demerits of flowcharting. 10
- (b) What is the difference between a linker and a loader ? 4

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2. (a) Discuss in detail advantages and drawbacks of machine, assembly and high-level languages. 10
- (b) What is the difference between Compiler and Interpreter ? 4
3. (a) What are various types of operators available in C ? Explain each operator by giving example ? 7
- (b) Explain the input and output statements available in C. 7
4. Write short notes on the following :
- (a) Compiler 5
- (b) Debugger 2
- (c) Assembler 2
- (d) Linker and Loader. 5
5. (a) Write a C program to calculate a factorial of a number using recursion. 8
- (b) Explain various types of control statements available in C. 6
6. (a) What is the difference between while loop and do-while loop ? Explain by giving example. 7
- (b) What is the difference between break and continue statement ? 7
7. (a) What are arrays ? How are they defined ? Explain their use with the help of an example. 7
- (b) What are local and external variables ? What do you understand by scope of a variable ? 7
8. (a) What is a pointer variable ? How is it different from other variables ? 6
- (b) What is a function ? What are different methods of passing arguments to a function ? Explain in detail. 8

(b) Determine the number of triangles that can be formed by selecting from a set of 15 points out of which 1 are collinear.

8. Define the following with suitable examples :

- (i) Composition of relations
- (ii) Combinatorial arguments.



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B.C.A. (First Year)/

Diploma in Computer Application

EXAMINATION

(New Scheme)

BCA/DCA-104

MATHEMATICAL FOUNDATION OF
COMPUTER SCIENCE

Time : Three Hours

Maximum Marks : 70

Note : Attempt any Five questions. All questions carry equal marks.

1. (a) Define identity and square matrix with suitable examples :

(b) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 4 \\ 1 & 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{bmatrix}$. If

A' denotes the transpose of the matrix A , verify that $(AB)' = B'A'$.

2. Find the inverse of the matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

where $ad - bc \neq 0$

3. (a) Define finite set and empty set with suitable examples.
 (b) Let $A = \{x : x^3 + 1 = 0\}$, $B = \{x : x^2 - x + 1 = 0\}$. Find $A \cap B$ when x is real and when x is not real.

4. (a) Let $R = \{1, 2, 3\}$ and $S = \{4, 5, 6\}$. Determine the Cartesian product.

- (b) Determine Finite set and Infinite set among the following :

- (i) $K = \{\text{cities in India}\}$
 (ii) $L = \{\text{members of the Parliament}\}$
 (iii) $D = \{x : x \text{ is a multiple of 3 and 5}\}$

5. (a) Let f, g be the functions from n to n , where n is the set of the natural numbers so that :

$$f(n) = (n + 1)$$

$$g(n) = 2n$$

Determine the composite functions :

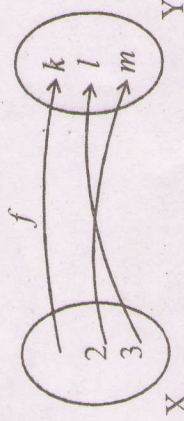
- (i) $f \circ f$
 (ii) $g \circ f$

- (b) If A has m elements and B has n elements, how many functions are there from A to B and from B to A .

6. Define the following with respect to :

- (i) Surjective functions

- (ii) Consider $X = \{1, 2, 3\}$, $Y = \{k, l, m\}$ and $f : X \rightarrow Y$ such that $f = \{(1, k), (2, m), (3, l)\}$ as in the given figure.



Find the inverse of f .

7. (a) How many ways can we select a software development group of 1 project leader, 5 programmers and 6 data entry operators from a group of 5 project leaders, 20 programmers and 25 data entry operators.