

BCA (Semester-I) Examination, 2022

(Session : 2021-24)

COMPUTER APPLICATION

[Paper Code : BCA-101].

(Mathematical Foundation)

Time : Three Hours]

[Maximum Marks : 80

Note : Candidates are required to give their answers in their own words as far as practicable. The questions are of equal value. Answer any five questions.

1. (a) For what value of x , the matrix

$$\begin{bmatrix} 3-x & 2 & 2 \\ 2 & 4-x & 1 \\ -2 & -4 & -1-x \end{bmatrix}$$
 is singular?

(b) If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$, find the value of $A^2 - 4A + 3I$, where I is the unit matrix with proper dimension.

2. (i) If $y = \sin[m \sin^{-1} x]$, prove that
 $(1-x^2) \cdot y_2 + m^2 y = 0.$

(ii) If $y^{\frac{1}{m}} + y^{-\frac{1}{m}} = 2x$, prove that :
 $(x^2 - 1) \cdot y_2 + x \cdot y_1 - m^2 y = 0.$

3. If $y = e^{a \sin^{-1} x}$, prove that :
 $(1-x^2) \cdot y_2 - x \cdot y_1 - a^2 y = 0.$

4. If $u = \sqrt{x^2 + y^2 + z^2}$, prove that :
 $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = \frac{2}{u}.$

5. Evaluate $I = \int \frac{\tan x \cdot \sec^2 x}{1 - \tan^2 x} \cdot dx$

✓6. Evaluate double integral $I = \int_0^2 \int_0^2 (x^2 + y^2) \cdot dx \cdot dy$

7. Solve the following :

$$(x^2 - y \cdot x^2) \cdot dy + (y^2 + x \cdot y^2) \cdot dx = 0$$

8. Apply Maclaurin's theorem to obtain the expansion of $\sec x$.

\mathcal{X} Solve $\frac{d^2y}{dx^2} - 4 \cdot \frac{dy}{dx} + 3y = 2 \cdot e^{3x}$

✓ 10. Write short notes on the following :

- (a) Transpose matrix
- (b) Singular matrix
- (c) Taylor's theorem
- (d) Inverse matrix

-----X-----

BCA (Semester-I) Examination, 2022

(Session 2021-24)

COMPUTER APPLICATION

[Paper Code : BCA-102 (Gr.-A)]

(Computer Fundamentals)

Time : Three Hours]

[Maximum Marks : 80

Note : Candidates are required to give their answer in their own words as far as practicable. Answer **any five** questions. The questions are of equal value.

1. Explain the different Generations of Computers in detail.
2. Draw the block diagram of a Digital Computer. Explain its components in detail.
3. What is Primary Memory? Distinguish between Primary Memory and Secondary Memory.

4. What is Output Device? Write down the types of Output Device used in Digital Computer.
5. What is Language Translator? Distinguish between Compiler and Interpreter.
6. What is Printer? Discuss the types of Printers in detail.
7. Explain the types of Computers according to their size in details.
8. Explain operating system. Discuss the types of operating system.
9. What is Flowchart? Write down the rules for making a Flowchart. Draw a Flowchart to find the sum of n Natural Numbers.
10. Explain High Level Language. Also, discuss its merits and benefits. Explain some High level Language which is used for General Purpose Programming.

-----x-----

BCA (Semester-I) Examination; 2022
(Session 2021-24)

**BUSINESS COMMUNICATION AND
INFORMATION SYSTEM**

[Paper Code : BCA-103]

Time : Three Hours]

[Maximum Marks : 80

Note : Candidates are required to give their answer in their own words as far as practicable. The questions are of equal value. Answer **any five** questions.

- 1.** Define the term "Barriers to Communication". Explain its various types.
- 2.** What do you mean by Communication? Explain its characteristics in detail.
- 3.** Explain the various ways for removing barriers to Communication.

4. What do you mean by Non-Verbal communication?
Explain its various types.
5. Explain the various skills required for participating in a Group discussion activity.
6. Describe the various types of questions that can be asked in any interview?
7. What is MIS? Explain the function of MIS.
8. Explain the different elements of system.
9. What are the various types of Information System?
10. Write short notes on **any two** of the following :
- (a) Knowledge Base System
 - (b) System Maintenance
 - (c) Classification of Mail
 - (d) Extempore speech

-----x-----

BCA (Semester-I) Examination, 2022

(Session : 2021-24)

COMPUTER APPLICATION

[Paper Code : BCA-104]

(C - Programming)

Time : Three Hours]

[Maximum Marks : 80

Note : Candidates are required to give their answer in their own words as far as practicable. Answer **any five** questions. The questions are of **equal** value.

1.  What is Looping Control Structure? Discuss the types of Looping Control Structure.
2. What is Data Structure? Discuss the types of Data Structure used in "C".
3. What is Pointer? Write a C program using pointer to print sum of N natural numbers.

4. Write short notes on **any two** of the following :

- (a) Pointer
- (b) Applications of C
- (c) Dynamic Memory Allocation
- (d) Function Prototype

5. Design and develop a C program to read a year as input and find whether it is leap year or not.

6. Write and explain the basic concepts of a C program.
Write the guidelines to use printf() function in C language.

7. Write a C program that :

- (i) Implements string copy operation STRCPY(str1, str2) that copies a string str1 to another string str2 without using library function.
- (ii) Reads a sentence and prints frequency of each of the vowels and total count of the consonants.

8. What is Function and its parameters? Explain different types of parameters in C Functions.

9. What is a File? Explain File Open and File Close functions with examples.
10. Write a C program to maintain a record of "n" students details using an array of structures with four fields-Roll Number, Name, Marks and Grade, Each field is of an appropriate data type. Print the marks of the student by giving "Student Name" as input.

-----x-----