BCA I[th] Semester Full and Reappear Examination, November-2023

COMPUTER AND PROGRAMMING FUNDAMENTALS

Paper–BCA-101

Time allowed : 3 hours] *[Maximum marks : 80*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt **five** questions in all, selecting **one** question from each unit. **Question no.1 is compulsory.**

1. (a) Define Memory.
(b) Explain Characteristics of Computer.
(c) What do you mean by Software?
(d) Explain Operating System.
(e) What do you mean by Debugging?
(f) Define Structured Programming.
(g) Explain MAN with its advantages.
(h) Define Networking. 8×2=16

Unit-I

2. Differentiate:
(a) Primary Memory and Secondary Memory
(b) Magnetic Tape and Magnetic Disk
(c) Human being and Computer 16

3. (a) Draw a block diagram of Computer with its Components. 8
(b) Define Computer with its characteristics and limitations. 8

Unit-II

4. (a) Explain Input and Output Devices in detail. 8

   (b) Define virus with its types in detail. 8

5. (a) Define operating system with its functions. 8

   (b) Difference between :

   (i) Single user and Multi User Operating System

   (ii) Multiprogramming and Multitasking 8

Unit-III

6. (a) Define structured programming with its advantages and disadvantages. 8

   (b) Explain :

   (i) Debugging

   (ii) Documentation

   (iii) Assembler 8

7. (a) Explain Structured Programming. Also explain top-down and bottom-up programming. 8

   (b) Define Programming language with its characteristics. 8

Unit-IV

8. (a) What do you mean by Networking ? Also explain the network types in detail. 8

   (b) Define Network Topologies. 8

9. Define:

   (a) Forms of Data Transmission 8

   (b) Application of Intranet 8

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B.C.A. 1st Semester (Full & Re-appear) Examination,

November–2023

PC SOFTWARE

Paper–BCA–102

Time allowed : 3 hours] *[Maximum marks : 80*

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Note : *Attempt* ***five*** *questions.* ***Question No. 1 is compulsory****, selecting* ***one*** *question from each unit.*

1. (a) What are the components of windows ?

(b) What are the different type of icons ?

(c) What is Auto-text ?

(d) What is the use of Print-Preview in MS-Word ?

(e) How would you use AutoSum ?

(f) How many row and column in one excel sheet ?

(g) What is slide show ?

(h) How to do layering objects in PowerPoint ?

Unit–I

2. (a) What is Operating System ? Explain the various functions of operating system.

(b) What is windows explorer ? What are the features and facilities available in it ?

3. Describe various option available under window accessories briefly.

Unit–II

4. (a) What do you understand by mail merge ? Explain with example.

(b) Explain :

(i) Text formatting

(ii) Paragraph formatting

5. Explain :

(i) Bookmark

(ii) Styles

(iii) Template

(iv) Header & Footer

Unit–III

6. Explain :

(i) Goal Seek

(ii) Pivot Table

(iii) Macros

(iv) Cell, Cell address and Cell referencing.

7. (a) Describe the syntax, use and purpose of four built-in functions used in MS-Excel with examples.

(b) What is meant by chart ? What are the utilities of chart ? How many type of charts can be drawn in MS-Excel ?

Unit–IV

8. (a) Describe the procedure of adding Excel chart to the slide.

   (b) What for MS-PowerPoint is meant ? Describe all the major capability of MS-PowerPoint.

9. (a) What are the different types of slide layout available in MS-PowerPoint ? Explain

   (b) How to add animation to the slide ? Explain.

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B.C.A. 1st Semester (Full and Re-appear)

Examination, November–2023

MATHEMATICS

Paper–BCA-103

Time allowed : 3 hours] *[Maximum marks : 80*

Note : *Attempt* ***five*** *questions in all, selecting* ***one*** *question from each unit.* ***Question No. 1 is compulsory.*** *All questions carry equal marks.*

1. (a) If A = {1, 3, 5, 7}, B = {2, 4 6, 8} and C = {0, 4, 5}. Write $A \cap B$ and $B \cup C$.

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

(c) If the function $f : R \to R$ defined by

$$f(x) = \begin{cases} 3x - 1, & \text{if } x > 3 \\ x^2 - 2, & \text{if } -2 \le x \le 3 \\ 2x + 3, & \text{if } x < -2 \end{cases}$$

Find (i) f(4), (ii) f(–3)

(d) Evaluate : $\lim_{x \to 1} \frac{x^3 - 1}{x - 1}$

(e) If $y = 5x^3 + 8x^2 - 7x + 10$, find $\frac{dy}{dx}$.

(f) If $y = \cos(2x + 1)$, find $\frac{dy}{dx}$.

(g) Evaluate $\int (2x+1)^{\frac{2}{3}} dx$

(h) Evaluate $\int_1^2 (3x - 2) dx$

Unit–I

2. (a) If $A = \{2, 4, 6, 8, 10\}$, $B = \{1, 2, 3, 4, 5, 6, 7\}$ and $C = \{2, 6\ 7, 10\}$, then verify that

(i) $A - (B \cup C) = (A - B) \cap (A - C)$

(ii) $A - (B \cap C) = (A - B) \cup (A - C)$

(b) For a certain test a candidate could offer English or Hindi or both the subjects. Total number of students was 500, of whom 350 appeared in English and 90 in both subjects.

(i) How many appeared in English only ?

(ii) How many appeared in Hindi ?

(iii) How many appeared in Hindi only ?

3. (a) Prove that

$$\begin{vmatrix} 1 & b+c & b^2+c^2 \\ 1 & c+a & c^2+a^2 \\ 1 & a+b & a^2+b^2 \end{vmatrix} = (a-b)(b-c)(c-a).$$

(b) Solve the following system of equations :

$6x + y - 3z = 5$

$x + 3y - 2z = 5$

$2x + y + 4z = 8$

Unit–II

4. (a) Determine whether the Relation R in the set $A = \{4, 5, 6, 7\}$ defined as $R = \{(4, 5), (5, 4), (7, 6), (6, 7)\}$ is reflexive, symmetric, transitive or anti symmetric ?

(b) Prove that f is a bijective function and hence find its inverse, f^{-1} where $f : R \to R$ is defined as $f(x) = 2x + 3$.

5. (a) (i) Evaluate : $\lim_{x \to 0} \frac{\sin 2x + \sin 6x}{\sin 5x - \sin 3x}$

(ii) Evaluate : $\lim_{x \to 0} \frac{x}{|x|}$

(b) Find the value of a if the function f is given by

$$f(x) = \begin{cases} 2x - 1, & x < 2 \\ a, & x = 2 \\ x + 1, & x > 2 \end{cases}$$

is continuous at $x = 2$.

Unit–III

6. Differentiate the following w.r.t. x

(i) $(x^2 - 4x + 5)(x^3 - 2)$

(ii) $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2$

(iii) $\frac{3x^2 - 2}{x^2 + 7}$

(iv) $\sqrt{1 + x^2}$

7. Differentiate the following w.r.t. x

(i) $\frac{x}{1 + \tan x}$

(ii) $(\sin^{-1} x)^2$

(iii) $\cos^{-1}\left(\frac{1 - x^2}{1 + x^2}\right)$

(iv) $e^x \log x$

Unit–IV

8. (i) Evaluate : $\int \frac{1}{\sqrt{2x - x^2}}\, dx$

(ii) Evaluate : $\int x^2 \sin x\, dx$

9. (i) Evaluate : $\int \frac{2x - 1}{(x - 1)(x + 2)(x - 3)}\, dx$

(b) Evaluate : $\int_0^{\pi/2} \frac{\sin \theta}{\sqrt{1 + \cos \theta}}\, d\theta$.

B.C.A. 1st Semester (Full & Re-appear) Examination,

November–2023

LOGICAL ORGANIZATION OF COMPUTER–I

Paper–BCA–104

Time allowed : 3 hours] *[Maximum marks : 80*

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Note : *Attempt **five** questions in all by selecting **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks.*

1. (a) What is BCD ?

(b) What is EBCDIC ?

(c) Differentiate canonical and standard forms.

(d) What is Boolean algebra ?

(e) What is universal gates ?

(f) Define digital signal.

(g) What is half adder ?

(h) What is code converter ?

Unit–I

2. (a) What do you mean by number system ? Explain different type of number system with example.

(b) Determine the single error-correcting code for the message code (1011) for even parity.

3. (a) What is fixed point representation of number ? Explain with example.

(b) Perform the following conversions

$(347)_{10} = ()_2 = ()_8 = ()_{16}$

Unit–II

4. Obtain the minimal POS expression for the function given below using a four variable K-Map

$F(A. B. C. D) = \prod(3, 4, 6, 7, 11, 12, 13, 14, 15)$

5. (a) State and prove De Morgan's Law.

(b) Simplify the following Boolean expression :

(i) AB + ABC' + A'BC + ABC

Unit–III

6. Realise the following logic operation using only NAND gates :

(i) NOR

(ii) XOR

(iii) XNOR

(iv) OR

7. (a) Explain :

(i) AND-OR-INVERT

(ii) OR-AND-INVERT

(b) What are the characteristics of combinational logical circuit ?

Unit–IV

8. (a) What do you mean by comparator ? Explain.

   (b) Differentiate between Half Subtractor and Full Subtractor.

9. Differentiate between the following :

   (i) Encoder and decoder

   (ii) Multiplexer and demultiplexer