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97661

BCA 1st Semester
Examination – December, 2022

COMPUTER & PROGRAMMING FUNDAMENTALS

Paper : BCA-101

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, 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. Q. No. 1 is ***compulsory***.

1. Write short notes on following : 16

(i) RAM

(ii) Keyboard

(iii) Assembly language

(iv) LAN

P. T. O.

UNIT – I

2. Define computer. Describe the block diagram of computer along with its components. 16

3. Explain the following : 16

   (i) Cache memory

   (ii) Flesh memory

UNIT – II

4. Define computer hardware and software. Explain types of software. Also explain the relationship between hardware and software. 16

5. Explain the following : 16

   (i) Antivirus software

   (ii) Functions of operating system

UNIT – III

6. Describe the following : 16

   (i) Forth generation languages

   (ii) Characteristics of good programming language

7. Give a complete description about structured programming. 16

UNIT – IV

8. Define network topology. Explain its types in detail. 16

9. Describe internet and its applications in detail. 16

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PC SOFTWARE

Paper : BCA-102

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, 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. Explain the following : 16

(a) Window Accessories

(b) Header and Footer

(c) Pivot Table and Pivot Chart

(d) Animations and Sounds

UNIT – I

2. (a) What do you mean by Windows ? Explain the basic components of Windows in detail. 8

(b) Explain how can you add and remove hardware and software in window environment. 8

3. Define Control Panel in detail. 16

UNIT – II

4. Describe the following features of MS-Word : 16

(i) Linking and Embedding objects

(ii) Template

(iii) Mail-Merge

5. Explain the following : 16

(i) Format Painter

(ii) File Management

(iii) Page Formatting

UNIT – III

6. What do you mean by chart ? Explain how many types of charts can be drawn in MS-Excel. 16

7. What is Spreadsheet ? Explain the features of Spreadsheet in detail. 16

UNIT – IV

8. (a) What are the different types of Slide Layout available in MS-PowerPoint ? 8

(b) What are the various formatting options available in MS-PowerPoint ? Explain in detail. 8

9: Explain the following : 16

(i) Word Art

(ii) Inserting Recorded Sound Effect

(iii) Layering art object

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BCA 1st Semester Examination – December, 2022

MATHEMATICS

Paper : BCA-103

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, 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***. All questions carry equal marks.

1. (a) If $A = \{2, 4, 6, 8\}$ and $B = \{6, 8, 10, 12\}$, write $A - B$ and $B - A$. 2

(b) Without expanding, prove that : 2

$$\begin{vmatrix} 1 & bc & a(b+c) \\ 1 & ca & b(c+a) \\ 1 & ab & c(a+b) \end{vmatrix} = 0$$

(c) If $f : R \to R$ is defined by $f(x) = 3x^2 - 8x + 1$, find $f(f(x))$. 2

(d) Evaluate : $\lim_{x \to 0} \frac{\sin 5x}{\sin 15x}$. 2

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

(f) Find : $\frac{dy}{dx}$, if $y = \cos x^4$. 2

(g) Evaluate : $\int \frac{dx}{4 + x^2}$. 2

(h) Evaluate : $\int_{-1}^{1} x^{99}\, dx$.

UNIT – I

2. (a) Prove that : $(A \cap B)' = A' \cup B'$. 8

(b) There are 210 members in a Club, 100 of them drink Tea and 65 drink Tea but not Coffee. Find :

(i) How many drink Coffee ?

(ii) How many drink Coffee but not Tea ? 8

3. (a) Prove that : 8

$$\begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ x^3 & y^3 & z^3 \end{vmatrix} = xyz(x-y)(y-z)(z-x)$$

(b) Find the inverse of the matrix : 8

$$A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$$

UNIT – II

4. (a) If R is a relation in $N \times N$, defined by $(a, b)\ R\ (c, d)$ if and only if $a + d = b + c$, show that R is an equivalence relation. 8

(b) Find the domain and range of the following functions : 8

(i) $y = \dfrac{x^2 - 1}{x - 1}, x \neq 1$

(ii) $y = \sqrt{9 - x^2}$

5. (a) Evaluate : 8

(i) $\lim\limits_{x \to 0} \dfrac{\tan 3x - 2x}{3x - \sin^2 x}$

(ii) $\lim\limits_{x \to 0} \dfrac{x^3 \cot x}{1 - \cos x}$

(b) Discuss the continuity of the function : 8

$$f(x) = \begin{cases} \dfrac{3}{2} - x, & \dfrac{1}{2} \leq x < 1 \\ \dfrac{3}{2}, & x = 1 \\ \dfrac{3}{2} + x, & 1 < x \leq 2 \end{cases}, \text{ at } x = 1.$$

UNIT – III

6. Differentiate the following functions w.r.t. x : $4 \times 4 = 16$

(i) $(x^4 + x)(5x^3 + 6x)$

(ii) $\dfrac{x^4 + 1}{x^2 + 1}$

(iii) $\dfrac{\sin x + \cos x}{\sin x - \cos x}$

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

7. Differentiate the following functions w.r.t. to x : $4 \times 4 = 16$

(i) $\tan^{-1}\left(\frac{\sin x}{1+\cos x}\right)$

(ii) $\log(x+\sqrt{x^2-a^2})$

(iii) $(\sin x)^x$

(iv) Differentiate $\sin x^3$ w.r.t. x^3

UNIT – IV

8. Evaluate : $4 \times 4 = 16$

(i) $\int \frac{x^4}{x+1} dx$

(ii) $\int \sqrt{1+\sin 2x}\, dx$

(iii) $\int \frac{1}{x(1+\log x)^2} dx$

(iv) $\int \frac{dx}{1-6x-9x^2}$

9. Evaluate : $4 \times 4 = 16$

(i) $\int x^2 \cos x\, dx$

(ii) $\int \sqrt{x^2-4x+2}\, dx$

(iii) $\int \frac{x}{(x+2)(3-2x)} dx$

(iv) $\int_0^{\pi/2} \log(\tan x)\, dx$

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BCA 1st Semester
Examination – December, 2022

LOGICAL ORGANIZATION OF COMPUTER - I

Paper : BCA-104

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, 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***. All questions carry equal marks.

1. (a) What is Unicode ?

(b) What is Number system ?

(c) What is Multiplexer ?

(d) Differentiate Encoder and Decoder.

(e) How does a NAND gate works ?

(f) What is Digital signal ?

(g) What is Boolean Function ?

(h) What is Venn diagram ?

UNIT – I

2. (a) Construct an even parity seven bit hamming code to transmit the data (i) 0100 (ii) 1110.

(b) What is BCD code ? What are the rule for BCD addition ? Explain with suitable example.

3. (a) Perform the following conversions $(37.125)_{10} = (\ )_2 = (\ )_8 = (\ )_{16}$.

(b) Add 10110111 and 01110101

(c) Subtract 10001 from 11001.

UNIT – II

4. Simplify the following Boolean function $F(A, B, C, D) = \Sigma(0, 1, 2, 5, 8, 9, 10)$ in SOP. Draw the logic circuit using gates.

5. (a) State and prove De Morgan law.

(b) Simplify the following Boolean expression :

(i) ABC'D' + ABC'D + ABCD' + ABCD

(ii) AB (A'BC' + AB'C' + A'BC)

UNIT – III

6. (a) How to realize OR, NOT, AND using universal gates ?

(b) What is the design procedure for combinational logic circuit ?

7. (a) What is an exclusive OR and exclusive NOR gate ? Draw its symbol and prepare truth table.

(b) Explain AND-OR-INVERT and OR-AND-INVERT gate.

UNIT – IV

8. (a) What is full adder ? How a full adder is built using half adder ?

(b) What is BCD to seven segment Decoder ? Explain.

9. (a) What are Encoders ? Draw and explain a Octal to binary encoder.

(b) What is full subtractors ? Prepare truth table circuit for full subtractor.
