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BCA 1st Semester (Full & Re-appear)

Examination, December-2024

COMPUTER & PROGRAMMING

FUNDAMENTALS

Paper : BCA-101

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

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

1. (a) What is anti-virus software?

(b) What is Problem design?

(c) What do you mean by Flash memory?

(d) What are the uses of Optical disks?

(e) What do you mean by Virtual memory?

(f) Explain modes of data transmission.

(g) What do you mean by Linker and Loader?

(h) Define the Forms of data transmission.

8×2=16

Unit–I

2. (a) What is Computer? Explain the characteristics and classification of computers in detail. 8

(b) Explain the following in detail : 2×4=8

(i) Block Diagram of Computer along with its components

(ii) Limitations of computers.

3. Explain the following in detail : 2×8=16

(a) Primary and Secondary memory

(b) Secondary storage device

Unit–II

4. (a) What is Operating system? Explain the functions of operating system in detail. 8

(b) What is computer virus? Explain its different types in detail. 8

5. (a) Explain Multiprogramming, Multitasking, Time-sharing and real time operating system in detail. 8

(b) What is Software? Explain its types and role. Also explain the relationship between hardware and software. 8

Unit–III

6. (a) What is Programming Language? What are the good features of a programming language? Explain. 8

(b) Explain the concept of Compiler and Interpreter in detail. 8

7. (a) Explain the concept of structured programming. Also explain the top-down and bottom-up programming. 8

(b) Explain the concept of Machine language and Assembly language in detail. 8

Unit–IV

8. Explain the following in detail : 2×8=16

(a) Hardware and Software requirements for Internet

(b) Network Topologies

9. (a) What is internet? Explain the history of internet. Also explain the main applications of internet. 8

(b) What do you mean by Computer networks? Explain the types of computer network in detail. 8

BCA 1st Semester 4 Year Course

Examination, December–2024

MATHEMATICS

Paper-23BCA401DS01

Mathematical Foundation of Computer Science

Time allowed : 3 hours] *[Maximum marks : 70*

Note : *Students have to attempt **five** questions in total, **first being compulsory** and selecting **one** from each unit. All questions carry equal marks.*

1. (a) How many number of subset of a set having n elements.

(b) Define equivalance relation ?

(c) Evaluate $\lim_{x \to 0} \frac{\sin x}{x}$

(d) Discuss the removable discontinuity.

(e) Find $\frac{dy}{dx}$ for $y = \sin^{-1}(x)$.

(f) If $\tan A = \frac{4}{3}$ then evaluate $\cos A$ and $\sin A$

(g) Evaluate the value of $\int_0^1 \frac{dx}{1+x^2}$.

Unit–I

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

(i) $A \cup B$

(ii) $A - B$

(iii) $A \cap B$

(b) In a group of 65-people, 40 like cricket, 10 like both cricket and tennis. find :

(i) How many like tennis ?

(ii) How many like tennis only and not cricket.

3. (a) If $f : R \to R$ is defined as $f(x) = \frac{5x+3}{7} : x \in R$.

Prove that f is bijective function and hence find the inverse of f.

(b) If the map $f : R \to R$ is given by $f(x) = \log(1+x)$ and the map $g : R \to R$ is given by $g(x) = e^x$ find $(g \circ f)\, x$ and $(f \circ g)\, x$.

Unit–II

4. (a) If $\tan A = ½$ and $\tan B = \frac{1}{3}$, find $\tan(2A+B)$.

(b) Show that $\lim_{x \to 0} \frac{e^{1/x}-1}{e^{1/x}+1}$ does not exist.

5. (a) Test continuity of the function

$$f(x) = \begin{cases} (x-a)\sin\frac{1}{x-a} & : x \neq a \\ 0 & : x = a \end{cases}$$

(b) Prove that

$$3\cos^2\frac{\pi}{4} + \sec\frac{2\pi}{3} + 5\tan^2\frac{\pi}{3} = \frac{29}{2}$$

Unit–III

6. Differentiate the following function with respect to x.

(a) $y = \tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$

(b) $y = \left(\frac{\sin x + e^x}{1+\log x}\right)$.

7. Differentiate the function with respect to x.

(i) $y = \frac{\sqrt{1+\cos x}}{\sqrt{1-\cos x}}$

(ii) $y = x^{\log x}$

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Unit–IV

8. (a) Let $f(x) = x^2 - 5x + 6$, find $f(A)$, If

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

(b) Prove that $\begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix} = x^2(a+b+c)$

9. (a) Solve the given system of linear equations by matrix method.

$x - y - z = 1,\ 2x + y + z = 2,\ x - 2y + z = 4$

(b) If $A = \begin{bmatrix} 1 & 3 & 5 \\ -1 & -3 & 7 \\ 0 & -5 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 4 & 6 \\ 0 & -2 & -4 \\ -6 & 8 & -8 \end{bmatrix}$

Prove that $(AB)^1 = B^1A^1$.

BCA 1st Semester (Full & Re-appear)

Examination, December-2024

Logical Organization of Computers-I

Paper : BCA-104

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

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

1. (a) What are Boolean Theorems?

(b) What are code converters?

(c) What are DeMorgan's Laws?

(d) What do you mean by digital logic? Explain.

(e) What are Demultiplexers? State its importance.

(f) What is Unicode? State its relevance.

(g) What is the smallest and largest integer number represented in a 32-bit computer?

(h) What are encoders? 8×2=16

Unit–I

2. (a) What are BCD codes? What is their significance? Discuss. 4

(b) Find out the values of X, Y and Z in the following : 12

$$(FA.C)_{16} = (X)_2 = (Y)_8 = (Z)_{10}$$

3. Explain the following :

(a) Character Codes 8

(b) Error detection and correction codes 8

Unit–II

4. (a) What is principle of Duality? Illustrate. 4

(b) Simplify the following Boolean expression using K-map : 12

$F(a, b, c, d) = \sum (1, 3, 4, 6, 7, 9, 11, 12, 13, 14)$

and obtain the expression in both SOP and POS.

5. Explain the following :

(a) Canonical form of Boolean Functions 5

(b) Venn diagrams 5

(c) De-Morgan's Law 6

Unit–III

6. (a) What are Universal Gates? Why these are named so? Justify. 6

(b) What do you mean by multilevel NAND and NOR circuits? Illustrate. 5

(c) What are AND-OR-INVERT and OR-AND-INVERT implementation? Explain. 5

7. (a) What is combinational circuit? What are its characteristics? Detail out the procedure for design of combinational circuit. 8

(b) Design a combinational circuit that receives 2-bit binary input and produces its square at the output. 8

Unit–IV

8. (a) What is a full-subtractor? Design a full-subtractor and implement the same using gates. 8

(b) What is a BCD to seven-segment Decoder? Design and implement it. 8

9. Explain the following :

(a) Multiplexer 8

(b) Magnitude Comparators 8

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BCA 1st Semester (4 Year Course)

Examination, December-2024

COMPUTER FUNDAMENTALS AND PROBLEM SOLVING USING C

Paper : 23BCA401DS02

Time allowed : 3 hours] *[Maximum marks : 50*

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

1. (a) Compare RAM with ROM. 2

   (b) What is debugging in programming? 2

   (c) Differentiate between constant and variables in C with example. 2

   (d) Compare i++ with ++i. 2

   (e) Define operating system and mention various functions of operating system. 2

Unit–I

2. What do you mean by computer networks? Discuss various network topologies with their pros and cons. 10

3. Explain the Block diagram of the computer system and explain the functions of each unit. Discuss classification of computer systems. 10

Unit–II

4. (a) Explain various symbols used in Flowcharts. Draw a flowchart to find the given number is odd or even. 5

   (b) What is an algorithm? Write an algorithm to find out smallest of 3 numbers. 5

5. (a) Explain the following : 5

   printf(), scanf(), getch(), main() and getchar()

   (b) Write a program in C to find out simple interest. 5

Unit–III

6. Compare if-else and switch () statements. Write a program to print the months of year using switch () statement and if statement. 10

7. (a) Write a program in C to find out if given No. is prime or not. 5

   (b) Explain the syntax of all types of loops with examples. 5

Unit–IV

8. What is a user defined function? What are its different elements? What are different methods of passing arguments to functions? Discuss with an examples. 10

9. (a) What is an array? Write a program to take 5 values from the user and store them in an array. 5

   (b) Discuss various string manipulation functions with examples. 5

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BCA 1st Semester (Full & Re-appear)

Examination, December-2024

PC SOFTWARE

Paper : BCA-102

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

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

1. Explain the following in detail : 8×2=16

(a) Difference between Slide View and Slide Sorter View

(b) Inserting Animated Pictures in PowerPoint

(c) Coping and moving file and folders

(d) Screensaver and Appearance

(e) Components of window

(f) Page formatting in MS-Word

(g) Finding and replacement text in MS-Word

(h) Word art in MS-PowerPoint

Unit–I

2. (a) What is Operating System? Explain the functions of Operating System in detail. 8

   (b) What are icons? Explain the types of icons. Also explain the various operations which can be performed with icons. 8

3. Explain the concept of Control panel and the role of control panel in detail. 16

Unit–II

4. (a) What do you mean by Word Processing? What are the advantages of Word Processing? Also explain how to create and save documents. 8

   (b) Explain in MS-Word the concept of Macros and file management in detail. 8

5. (a) What is mail merge? Write the steps involved in creating a mail merge in detail. Also explain the benefits of mail merge. 8

   (b) Explain in MS-Word the concept of Linking and embedding object in detail. 8

Unit–III

6. (a) What is MS-Excel? How to manage and organize data in MS-Excel? Also explain the main applications of MS-Excel. 8

   (b) What is Spreadsheet? Explain the features of spreadsheet in detail. 8

7. (a) What is Worksheet? Explain the various operations you can perform on your worksheet in detail. 8

   (b) Explain the following in detail :

   (i) Database management using Excel 4

   (ii) Formulas and functions 4

Unit–IV

8. Explain the following in MS-PowerPoint in detail :

   (a) Organizational charts and Animations 8

   (b) Manipulating and Enhancing 8

9. (a) What is PowerPoint? What is the various application of the PowerPoint? Explain. 8

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