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BCA/D-13

COMPUTER AND PROGRAMMING FUNDAMENTALS

Paper-III

Time allowed : 3 hours]

[Maximum marks : 80

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

1. Explain: 16
- (i) Flash memory
 - (ii) Debugging
 - (iii) Pseudo code
 - (iv) Virus
 - (v) RAM
 - (vi) ROM
 - (vii) Hardware
 - (viii) Decision table.

Unit-I

2. What is a computer ? Explain working of computer with block diagram with its components. 16
3. What is main and secondary memory ? Explain some secondary storage devices. 16

Unit-II

4. What is an operating system ? Explain the function of operating system. 16

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5. (a) What is software ? Explain various types of software. 8
(b) Explain the difference between multi-tasking and multi-threading. 8

Unit-III

6. What is a program ? Explain various steps for planning a program. 16
7. What is an algorithm ? Explain. Write an algorithm for finding largest of three given numbers. 16

Unit-IV

8. Explain the difference between searching and merging. Write an algorithm to sort a list of N numbers using bubble sort method. 16
9. Explain the difference between assembly and high level language. Also explain the characteristics of a good programming language. 16

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BCA / D-13

WINDOWS AND PC SOFTWARE

Paper-BCA-112

Time allowed : 3 hours]

[Maximum marks : 80

Note : Question number 1 is compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each unit.

1. Select right choice :

- (i) While working with MS- Windows which command transfers a specific file from one disk to another ?
(A) Copy (B) Diskcopy
(C) Time (D) Rename
- (ii) Which command divides the surface of the blank disk into sectors and assign a unique address to each one
(A) Ver (B) Format
(C) Fat (D) Chkdsk
- (iii) CD-ROM is a
(A) Semiconductor memory
(B) Memory register
(C) Magnetic memory
(D) None of above
- (iv) A floppy disk contains
(A) Circular tracks only
(B) Sectors only
(C) Both circular tracks and sectors
(D) All of the above

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- (v) Which of the following is not a valid Zoom percentage in Excel?
(A) 10 (B) 100
(C) 300 (D) 500
- (vi) What is entered by the function = today ()
(A) The date value for the day according to system clock
(B) The Time value according to system clock
(C) Today's date as Text format
(D) All of above
- (vii) Merge cells option can be applied from
(A) Format Cells dialog box Alignment Tab
(B) Formatting toolbar
(C) Both of above
(D) None of the above
- (viii) The name of box on the left of formula bar
(A) shows the name of workbook currently working on
(B) shows the name of worksheet currently working on
(C) shows the name of cell or range currently working on
(D) none of the above

Unit-I

2. Give a brief introduction to Windows operating systems. What are hardware requirements of windows XP operating system? 16

(3)

3. Explain following :
(i) CD (ii) Pen drive
(iii) Media players (iv) Word Pad 4×4
- Unit-II**
4. Explain following with concern to window operating system :
(i) Disk Defragmentation
(ii) Web browser
(iii) Drive Space
(iv) Character Map. 4×4
5. What is control panel ? Explain various steps to add new hardware. 16

Unit-III

6. What is Spreadsheet ? Explain various applications of any spreadsheet software. 16
7. Explain various methods of inserting, deleting and hiding a rows and columns from a worksheet by giving suitable example. 16

Unit-IV

8. How are charts useful in MS-Excel ? Describe various steps to create a chart. 16
9. Explain various steps to create a pivot table and pivot chart with suitable example. 16

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BCA (11/12) / D-13

PC-SOFTWARE

Paper- BCA-112

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt five questions in all, selecting one question from each unit in addition to compulsory Question No. 1.

(Compulsory Question)

1. (a) How many rows and columns are there in MS-Excel Worksheet ? 2
- (b) How date and time can be changed in computer ? 2
- (c) How elements can be sorted in MS-Excel ? 2
- (d) Write steps for inserting sound-effect in slide. 4
- (e) What is office Automation ? 3
- (f) How files and folders can be copied to other drives ? 3

Unit-I

2. (a) Write note on :
 - (i) Desktop
 - (ii) Recycle Bin 2×4=8
 - (b) Explain various types of icons. 8
3. Explain various windows accessories and their roles. 16

Unit-II

4. What is Mail-Merge ? Also write down various steps to perform it by giving suitable examples. 16

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5. Explain following Tools in MS-Word :

- (a) Spelling and Grammar
- (b) Find and Replace
- (c) Cut-Paste and Copy-Paste
- (d) Linking and Embedding Object.

4×4=16

Unit-III

6. (a) What are the various application areas of MS-Excel ?

10

(b) What is Pivot Chart ? How it is useful ?

6

7. Write note on following function in MS-Excel with example :

(a) IF (b) COUNT

(c) ODD and EVEN (d) FLOOR

4×4=16

Unit-IV

8. Explain Role of PowerPoint in :

(a) Education (b) Business

(c) Computer Industry (d) Media

4×4=16

9. (a) What is Animation and how it can be incorporated in PowerPoint ?

8

(b) How charts can be created in MS-PowerPoint ?

8

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BCA (11/12) / D-13

COMPUTER ORIENTED NUMERICAL METHODS

Paper-BCA-113

Time allowed : 3 hours]

[Maximum marks : 80

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

Compulsory Question

1. (a) Triangulize the Matrix :

$$\begin{pmatrix} 1 & 3 & 8 \\ 2 & 4 & 3 \\ 1 & 3 & 4 \end{pmatrix}$$

3

(b) Differentiate Runge Kutta second order formula and Runge Kutta fourth order formula for solving differential equation. 4

(c) Determine the order of convergence of False position method. 3

(d) Explain inherent error and round off error with example. 3

(e) Write necessary condition for convergence of Gauss Seidal method for solving simultaneous equations. 3

Section-A

2. (a) Using bisection method, to find a real root of the equation $f(x) = x^3 - 5x - 4 = 0$ upto four decimal places. 8

(b) Use Newton Raphson's method to find a root of the equation $f(x) = x^2 - x - 1 = 0$ for accuracy upto four decimal places. 8

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3. (a) Explain normalized floating point representation of real numbers? Determine maximum and minimum value of a floating point number of 4 bytes. 8
- (b) Use false position method, determine the real root of the function $f(x) = x^3 + 7x^2 + 9 = 0$ upto four decimal places. 8

Section-B

4. (a) Use Gauss Seidal method, to solve the following simultaneous equations

$$10 X_1 - 5 X_2 - 2 X_3 = 3$$

$$-4 X_1 + 10 X_2 - 3 X_3 = 3$$

$$-X_1 - 6 X_2 + 10 X_3 = 3$$

Iterate three times with initial value $X_0 = 0$. 8

- (b) Differentiate partial pivoting and complete pivoting with example. 8

5. (a) Use Euler's modified method to find $y(0.2)$, taking $h = 0.1$, given differential equation

$$\frac{dy}{dx} = x^2 + \sqrt{y}; y = 1 \text{ when } x = 1 \quad 8$$

- (b) Solve differential equation $\frac{dy}{dx} = 1 + y^2$; where $y = 1$ when $x = 0$ taking $h = .1$ find $y(0.2)$ using Runge Kutta 4th order formula. 8

Section-C

6. (a) Determine the function $f(x)$ when $x = 2$ using Lagrange's formula for unequal interval for table:

x	0	1	4	6
f(x)	9	15	27	46

8

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- (b) Use Taylor's series expansion, find the appropriate polynomial and also find the range upto 4 decimal places for differential equation $\frac{dy}{dx} = 0.1(x^3 + y^2)$; where $y = 1$ if $x = 0$. 8

7. (a) Use Newton's interpolation formula for equal interval to find y when $x = 23.4$ for the table

x	19	20	21	22	23	24	25
y	91	100.25	110	120.25	131.0	142.25	154.0

8

- (b) Explain Chebyshev's polynomial of first and second kind and determine their relationship. 8

Section-D

8. Solve the integral $\int_0^1 \frac{dx}{1+x^2}$ by taking $h = 1$ by using

(a) Trapezoide's rule 8

(b) Simpson's $\frac{3}{8}$ th rule 8

9. (a) Find $y'(1.5)$ and $y''(1.5)$ using numerical differentiation for the table

x	1.0	1.5	2.0	2.5	3.0
y	1.729	1.691	1.505	1.416	1.311

8

- (b) Use Gauss Legendre's integral formula to evaluate

$$\int_{-1}^1 \frac{1}{x} dx.$$

8

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MATHEMATICAL FOUNDATION-I

Paper-BCA-113

Time allowed : 3 hours]

[Maximum Marks : 80

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

(Compulsory Question)

1. (a) If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{1, 2, 3, 4, 5, 6, 7\}$, $B = \{2, 6, 7, 10\}$ then verify that $(B \cup A)' = B' \cap A'$ 4

(b) Define partial ordering relation. Explain its all the three properties. 3

(c) Prove that $\lim_{n \rightarrow \infty} \frac{\sum n^2}{n^3} = \frac{1}{3}$ 3

(d) If $y = \sqrt{x + \sqrt{x + \sqrt{x + \dots \infty}}}$,

Show that $(2y - 1) \frac{dy}{dx} = 1$ 3

(e) Show that $x^2 + 4y = 0$ is a

solution of $\left(\frac{dy}{dx}\right)^2 + x \frac{dy}{dx} - y = 0$ 3

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Section-I

2. (a) In a group of 65 people, 40 like Cricket, 10 like both Cricket and Tennis. 8

(i) How many like Tennis?

(ii) How many like Tennis only and not Cricket?

(b) Consider the sets $S_1 = \{5, 6, 7\}$, $S_2 = \{2, 4, 5, 9\}$, $S_3 = \{3, 4, 5, 6, 8, 9\}$, $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

Write the non-empty minsets generated by S_1, S_2, S_3 . Also write the Partition. 8

3. (a) Find r , if ${}^5P_r = 2 \cdot {}^6P_{r-1}$ 8

(b) A polygon has 44 diagonals. Find number of its sides. 8

Section-II

4. (a) Using $\epsilon-\delta$ definition, Prove that

$$f(x) = \begin{cases} x^2 \cos \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

is continuous at $x=0$ 8

(b) If $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$

Prove that $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{\sqrt{1-x^2}}$ 8

5. (a) Find n^{th} derivative of $\log(ax+b)$. 8

(b) Differentiate $(x)^{(\tan x)} + (\sin x)^{\cos x}$ w.r.t. x . 8

(3)

Section-III

6. (a) Find Differential Equation of system of circles touching y -axis at the origin. 8

(b) Solve $x \frac{dy}{dx} - y = \sqrt{x^2 + y^2}$ 8

7. (a) Solve $(1+x^2) \frac{dy}{dx} + 2yx - 4x^2 = 0$ 8

(b) Verify $(1+e^{x/y}) dx + e^{x/y} \left(1 - \frac{x}{y}\right) dy = 0$ is exact and hence solve it. 8

Section-IV

8. (a) Solve the Differential Equation

$$\frac{d^2y}{dx^2} - 4 \frac{dy}{dx} + 4y = x^2 + e^x + \cos 2x$$
 8

(b) Solve the Differential Equation

$$\frac{d^2y}{dx^2} + 2 \frac{dy}{dx} + y = e^x \sin 2x$$
 8

9. (a) Solve $x^3 \frac{d^3y}{dx^3} + 2x^2 \frac{d^2y}{dx^2} + 2y = 10 \left(x + \frac{1}{x}\right)$ 8

(b) Solve the Differential Equation

$$(3x+2)^2 \frac{d^2y}{dx^2} + 3(3x+2) \frac{dy}{dx} - 36y = 3x^2 + 4x + 1$$
 8

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BCA/D-13

LOGICAL ORGANIZATION OF COMPUTER-I

Paper-BCA-114

Time allowed : 3 hours]

[Maximum marks : 80

*Note : Attempt any five questions. Each carry equal marks.
First question is compulsory. Attempt other four
questions selecting one from each unit.*

1. (i) Explain Minterm
- (ii) What is De-Morgan's law ?
- (iii) Explain two's complement
- (iv) $(101101101.101) = ()_8$
- (v) What is AND gate ?
- (vi) What is don't care condition ?
- (vii) What is multiplexer ?
- (viii) What is code converter ?

2×8=16

Unit-1

2. (a) Write method of subtraction using one's complement give example
- (b) $(251.25)_8 = (?)_2$
- (c) $(ABC)_{16} = (?)_2 = (?)_{10}$

8,4,4

or

3. (i) Explain Error detecting and correcting codes give example.
- (ii) Explain BCD code. How Addition is done using BCD code ? Give example.

8,8

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(2)

Unit-2

4. (i) Draw the K-map for
 $F(x, y, z, w) = \Sigma(4, 5, 6, 7, 11, 12, 14)$
- (ii) Explain two canonical forms of boolean expression. 8,8
- or
5. (i) Explain Duality principals
- (ii) What is truth table, write truth table for expression
 $X \cdot (Y+Z) + XY$
- (iii) Explain validity of Eq.
 $Z\bar{X} + ZXY = ZX$ 5,5,6

Unit-3

6. (i) Construct logic circuit for Boolean expression
 $\overline{A \cdot B} + C \cdot D + \overline{E \cdot F}$
- (ii) Explain implementation of NOT, AND, OR gates by NOR gates. 8,8
- or
7. (i) Explain working of exclusive OR and OR gate with table.
- (ii) "AND, OR, NOT" gates are logically complete", Discuss. 8,8

Unit-4

8. Define Combinational Circuit. Explain Full Adder with circuit Diagram.
- or
9. What is code converter ? Make a code converter of 8421 To Cyclic Code. 16

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LOGICAL ORGANIZATION OF COMPUTERS-I

Paper-BCA-114

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt any five questions. Select one from each unit.

Q. No. 1 is compulsory.

1. (a) Discuss cyclic code. 3
(b) Abbreviate
ASCII, BCD, EBCDIC. 3
(c) Make 'Venn Diagram for AND gate. 3
(d) Make T.T. for 3 variable AND, NOR gate 3
(e) Discuss Half Adder 3
(f) Make T.T. (only) for
 $a + (b + c) = (a + b) + c$ 1

T = 16

Unit-I

2. Convert as follows :

- (a) (i) $(7.3)_{10} \rightarrow ()_2$
 $\rightarrow ()_8$ 4
(ii) $(X)_5 = (2134)_{10}$ 2
(iii) $(DE4) \rightarrow ()_2$
 $\rightarrow ()_8$ 4

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(b) Use 2's complement to solve :

$$\begin{array}{r} -16 \\ + 48 \\ \hline -20 \\ \hline -32 \end{array}$$

6

3. (a) Discuss floating point Arithmetic with conditions of overflow and underflow. 8
- (b) Explain error detection and correction coding scheme. 5

Unit-II

4. (a) Write postulates of Boolean Algebra. 8
- (b) State and prove Demorgan's Law. 4
- (c) Solve using Boolean Algebra $(X + Y)(XZ + Z)(\bar{Y} + XZ) = \bar{X}YZ$. 4
5. (a) Draw and label 4 variable K-Map 4
- (b) Solve using K-Map

$$Z(A, B, C) = \sum 1, 3, 5 + \sum 6, 7$$

$$Z(A, B, C, D) = \pi 0, 1, 2, 3, 8, 9, 10, 11$$

$$Z(A, B, C, D) = \sum 0, 1, 4, 5, 14 + \sum 10, 11, 15$$

Unit-III

6. (a) Prove that NAND, NOR are Universal gates. 4
- (b) Use NAND gates only to solve Full-Adder. 4

(3)

(c) Use Logic Gates to Design

$$(\bar{X}Y + X\bar{Y})(\bar{A}B C + \bar{A}B\bar{C})$$

$$(\bar{a} + \bar{b}) \cdot (a + b) \cdot (\bar{X}Y + PQ)$$

8

7. (a) Explain Design and Analysis Procedure of Combinational Circuits. 8
- (b) Explain concept of Multilevel NAND and NOR gates. 8

Unit-IV

8. (a) Design 4 : 1 multiplexer. 8
- (b) Design Binary to Decimal Decoder as 4 to 10 line. 8
9. (a) Explain 7-Segment Display. 8
- (b) Make code convertor from 8421 to cyclic. 8

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BCA / D-13

COMMUNICATIVE ENGLISH

Paper-BCA-115

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt five questions in all, selecting one question from each unit. All questions carry equal marks.

Unit-I

1. Discuss the theme of the story 'The Verger' in your own words.

or

Give a brief critical appreciation of the essay 'The Pleasures of Ignorance.' 16

2. Attempt any five of the following questions :

- (i) What does Narayan say about admission in our educational institutions ?
- (ii) What created uproar at the meeting of the animals ?
- (iii) What did Socrates realise at the age of seventy ? Why does Lynd remind us of that ?
- (iv) What trainings does Gandhiji talk about in his essay ? Which one of them, he says, is the most important ?
- (v) How did Pan-Biri Wallah treat old Bapu ?
- (vi) How did Ranji lose his magic bat ?
- (vii) Who is Ilse ? What is her rôle in the play 'Day of Alonement' ?

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- (viii) What did MacIntosh advise Rory to do in the court ?
 (ix) Who was Mr. Kumar ? What role does he play in the story ?
 (x) Who was Holtz ? What type of man was he ? Where did he work ? What kind of duties did he perform ? 16

Unit-II

3. Read the passage and answer the questions given at the end :
 At last I picked up a ruler lying at hand and delivered a blow on his arm. I trembled as I struck him. I dare say he noticed it. This was an entirely novel experience for them all. The boy cried out and begged to be forgiven.
- (a) Who is the speaker of these lines ?
 (b) Why did the speaker deliver a blow on the boy's arm ?
 (c) What has been referred to as 'a novel experience' ?
 (d) Why did the speaker tremble as he struck ?
 (e) Use the following words in your own sentences :
 (i) deliver (ii) dare (iii) beg 16
4. (A) Write a note on fax. 5
 (b) Describe how e-mail functions. 5
 (C) What is the usual way of composing a text message ? Explain. 6

Unit-III

5. Attempt any *sixteen* items out of the following :
- (A) Fill in the blanks with correct articles :
 (i) _____ gold used in the making of this ring was imported from China.
 (ii) Can you give me _____ one-rupee note ?
 (iii) _____ Arabian sea lies on the west of India.
- (B) Fill in the blanks with correct prepositions :
 (i) Flour is made _____ wheat.
 (ii) You should be honest _____ business.
 (iii) Are you satisfied _____ my work ?
- (C) Fill in the blanks with correct forms of verbs :
 (i) It _____ since ten o'clock. (rain)
 (ii) We shall go out for a walk when it _____ raining. (stop)
 (iii) Anyone who _____ late shall not be admitted. (reach)
 (iv) She _____ happy since her husband died. (never be)
- (D) Add appropriate 'question tags' to the following sentences :
 (i) She has really won your heart.
 (ii) You will leave tomorrow.
 (iii) He can't help you.
 (E) Change the voice :
 (i) This jug contains water.

- (ii) The news surprised us all.
- (iii) Which book do you like most ?
- (iv) She gave me a piece of advice.
- (F) Fill in the blanks with correct degrees of the adjectives given against each sentence :
- (i) No one can do it _____ than you. (good)
- (ii) This is _____ pen I have ever bought. (expensive)
- (iii) She is _____ than any other girl of her class. (tall)
- (A) Write a paragraph of about 150 words on any *one* of the following topics :
- (i) If I were the Principal of my College
- (ii) Computer Literacy
- (iii) Value of Books
- (iv) Female Foeticide
- (v) An Ideal Student
- (B) Change the narration of any *five* :

- (i) She said to me, "Why are you so sad today ?"
- (ii) The beggar said to the traveller, "Please help me."
- (iii) The farmer said, "Alas ! I am ruined."
- (iv) My friend said to her, "Did you like my poem ?"
- (v) She said to her father, "I shall never do it again."
- (vi) Suman said to Prakash, "If you helped me, I would pass."
- (vii) He said, "Let us start the game."

Unit-IV

7. Write a letter to the principal of a college applying for the post of a Computer Instructor.

or

Write a letter to the Station House Officer of the local Police Station requesting him to take action to prevent the increasing incidents of theft in your locality.

8. Describe in dialogue form any *two* of the following :

- (i) A conversation between a doctor and a patient
- (ii) A conversation between bank officials and a customer who wants to open an account with the bank.
- (iii) A conversation between a candidate for a job and the interview board.
- (iv) A telephonic conversation between two friends.

Unit-V

9. Explain the important provisions of the Right to Information Act, 2005. What kind of information is not obtainable under the act ? 16
10. What are the appellate authorities created under the RTI Act, 2005 ? How do they function ? What are the terms and conditions of the appointment of their members ? 16

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MATHEMATICAL FOUNDATION-I

Paper-BCA-115

Time allowed : 3 hours]

[Maximum Marks : 80

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

Compulsory Question

1. (a) Write down all subset of $\{1, 2, 3\}$ 3
- (b) Solve $\frac{d^2y}{dx^2} + 4y = 0$. 3
- (c) Find n^{th} derivative of $\sin(2x + 1)$ 3
- (d) Define order and degree of differential equation. 3
- (e) Define lattice 2
- (f) Define Equivalence relation on set. 2

Section-I

2. (a) Which of the following lattices are Boolean algebras
(i) D_6 (ii) D_{12} (iii) D_{20} (iv) D_{99} 8
- (b) A polygon has 44 diagonals. Find the number of its sides. 8
3. (a) Prove that $A - (B \cup C) = (A - B) \cap (A - C)$ 8
- (b) Define set, subset, Power set, compliment of a set. 8

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Section-II

4. (a) Show that $\lim_{x \rightarrow 0} \frac{e^{1/x}}{e^{1/x} + 1}$ does not exist 8
- (b) If $e^x + e^y = e^{x+y}$. Find $\frac{dy}{dx}$ 8
5. (a) Using $\epsilon - \delta$ method definition, prove that $\cos^2 x$ is a continuous function. 8
- (b) Find n^{th} derivative of $\frac{x}{1 + 3x + 2x^2}$ 8

Section-III

6. (a) Find the differential equation of the system of circles touching x -axis at the origin. 8
- (b) Solve $(x^2 + y^2 + 2x) dx + 2y dy = 0$ 8
7. (a) Solve $y dx - (x + 2y^2) dy = 0$ 8
- (b) Solve $(\tan^{-1} y - x) dy = (1 + y^2) dx$. 8

Section-IV

8. (a) Solve $\frac{d^2y}{dx^2} + 4y = x \sin x$ 8
- (b) Solve $\frac{d^2y}{dx^2} + y = \sec x$ 8
9. Solve $x^2 \frac{d^2y}{dx^2} + 3x \frac{dy}{dx} + y = \frac{1}{(1-x)^2}$ 8
- Solve $\frac{d^2y}{dx^2} + y = \sin x \cos 2x$ 8

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BCA / D-13
PROGRAMMING IN 'C'

Paper- BCA-116

Time allowed : 3 hours]

[Maximum marks : 80

Note : Student will be required to attempt five questions in all.

Question number '1' is compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each unit.

1. **(Compulsory question) :** 8×2=16

- (i) Explain structure of program in 'C' language.
- (ii) What is purpose of symbolic constant ? Give example.
- (iii) What is the purpose of gets () and puts () functions. Give examples.
- (iv) Give one example depicting use of conditional operator.
- (v) Write syntax of switch statement with example.
- (vi) Differentiate between while and do-while statement.
- (vii) Write short note on 'passing arrays to functions'. Give example.
- (viii) Write a program in 'C' language to swap two numbers.

Unit-I

2. Explain character set and data types used in 'C' language along with example. 16

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3. Explain the following with examples :

- (a) Identifiers and Keywords 8
- (b) Formatted Input / Output Functions. 8

Unit-II

- 4. (a) Discuss various types of operators available in 'C' language. Also write down the precedence of operators. 8
- (b) Write a program to find the largest among three numbers. 8
- 5. (a) Differentiate between 'nested if' and 'else-if' ladder statement. Explain with example. 8
- (b) Explain type casting and conversion with examples. 8

Unit-III

- 6. What is the purpose of break and continue statement. Differentiate between these statements by writing one program for each statement in 'C' language. 16
- 7. (a) What is recursion? Write a program to find factorial of a number using recursion. 8
- (b) Explain various parameters passing techniques used in 'C' language. 8

Unit-IV

- 8. Explain different types of storage classes available in 'C' language along with their scope, storage and lifetime. 16
- 9. (a) How the arrays are declared, initialized and processed in 'C' language? 8
- (b) Explain various string handling functions available in 'C' language along with examples. 8

(4)

3. Several books on that subject _____ during the present year. (appear)
 4. It _____ continuously since six o'clock this morning.
- (d) Change the voice of the following :
1. I know Mr. Armit.
 2. They have sent the report.
 3. Who teaches you Physics ?
 4. She helps the poor.

7. Write a paragraph in about 150 words on any *one* of the following topics :
- Internet Craze
Evils of Drinking
Value of Books
Fashion among Students

Unit-IV

8. Write a letter to the Superintendent of Police drawing his attention to the increasing number of thefts in your area.
- or
- Write a letter to the SDO (Electricity) of your area complaining about the frequent breakdown of electricity.

9. Compose dialogues between two friends discussing their future plans.

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Printed Pages : 4

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BCA (11/12) / D-13

COMMUNICATION SKILLS (English)

Paper-BCA-116

Time allowed : 3 hours] [Maximum marks : 80

Note : Attempt five questions in all. Question No. 1 is compulsory. The remaining four questions are to be attempted selecting one from each unit. All questions carry equal marks.

1. Write short answers of the following :

- (i) Complete the following :
Self-realization was, according to Gandhiji _____.
- (ii) Ranji was going to play _____, but at the last moment _____.
- (iii) Who was Moses ?
- (iv) What was Petrov's wife suffering from ?
- (v) Who was Ranji ?
- (vi) What had MacCallum seen Rory do ?
- (vii) Define Fax message.
- (viii) What does R. K. Narayan mean by "a grand musical-chair-manner" ?

Unit-I

2. Bring out Gandhiji's main arguments in "Training of the Spirit".
- or
- "...a living picture of sorrow and suffering..." Draw a pen-portrait of Old Bapu in the light of these words.

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P.T.O.

3. Attempt any five short answer type questions :

- (i) What does Gandhiji mean by "the culture of the spirit" ?
- (ii) What is Narayan's opinion about the prevailing system of examination ?
- (iii) Why did Petrov wish to live another life again ?
- (iv) How was the new vicar different from the old one ?
- (v) How did Ranji lose the "magic" bat ?
- (vi) Why would not Mr. MacCallum go to the fire in the waiting room ?
- (vii) Do you feel sad at the end of the play "Day of Atonement" ? If yes, why ? If no, why not ?
- (viii) Name the three types of training Gandhiji aimed at. Which of these types was, according to him, more difficult than the other two ?

Unit-II

4. Read the following passage carefully and answer the questions :

Ranji could not ignore Mr. Kumar, who had been so kind and helpful, always giving him advice on how to play different kinds of bowling. Mr. Kumar had been a test player once, and had scored a century in a one day game at Sharjah. Now he had retired from first-class cricket, but he liked encouraging young players and he thought Ranji would make a good cricketer.

- (i) Why could Ranji not ignore Mr. Kumar ?
- (ii) Where had Mr. Kumar once scored a century ?

- (iii) What was he doing now ?
 - (iv) What was his opinion about Ranji ?
 - (v) Pick out prepositions from the passage.
5. (a) Discuss the role of a fax message in the business world.
 (b) Explain the essentials of writing formal e-mails.
 (c) What are the features of writing text message ?

Unit-III

6. Do as directed :

- (a) Fill in the blanks with articles :
 1. _____ water in that stream is not suitable for drinking.
 2. I have never heard such _____ absurd story.
 3. Everyone respects _____ honest person.
 4. Italy is _____ European country.
- (b) Fill in the blanks with prepositions :
 1. We leave for our holiday _____ Friday.
 2. The work must be finished _____ the end of the week.
 3. The prisoner was accused _____ ill-treating his small child.
 4. We were glad to get rid _____ such an untrustworthy person.
- (c) Fill in the blanks with correct form of verb :
 1. _____ you _____ playing football ? (like)
 2. A schoolboy _____ a purse full of money lying in the gutter. (find)

Roll No.

Total Pages : 3

BCA(12/13)/D-13

724

'C' PROGRAMMING-II

Paper-BCA-231

Time Allowed : 3 Hours]

[Maximum Marks : 80

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

1. Compulsory question :

- (a) Explain strrev() function and its uses. 3
- (b) What is a nested structure? Describe with one example. 3
- (c) Write advantages of pointers. 3
- (d) What is the syntax and purpose of # define directive? 3
- (e) How memory is allocated dynamically using calloc() function? 2
- (f) Write a short note on enum datatype? 2

UNIT-I

- 2. (a) Explain formatted and unformatted Input/Output functions available in C language for string data type. 8
- (b) Write a program to count the number of characters in a string without using string handling function. 8

724/K/60/4,200

P. T. O.

3. Differentiate the following :
- (a) String constant and string variable 8
 - (b) Structure and union data type. 8
- UNIT-II**
4. Explain the following with suitable example :
- (a) Pointer to pointer 6
 - (b) Pointer to function 6
 - (c) NULL pointer. 4
5. (a) What are the uses of pointers in passing parameters to function? 8
- (b) Write a program to accept a linear array and display using pointer. 8

UNIT-III

6. Differentiate the following functions :
- (a) Sscanf() and fscanf() 8
 - (b) fseek() and ftell() 8
7. Explain :
- (a) Errors in File Handling 8
 - (b) File access methods. 8

UNIT-IV

8. (a) Explain with example the features of a C preprocessor. 8
- (b) Describe MACRO with arguments. 8

BCA(12/13)/D-13

725

DATA STRUCTURES-I

Paper-BCA-232

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt **five** questions in all. Question No. 1 is compulsory. In addition to compulsory question, attempt **four** more questions selecting exactly **one** question from each Unit. All questions carry equal marks.

1. (a) What do you mean by data structure?
- (b) Name various ways to store strings in computer memory.
- (c) How linear array is represented in computer memory?
- (d) What do you understand by garbage collection in computer memory?
- (e) What is recursion?
- (f) Name any four applications of queue.
- (g) How binary tree is stored in computer memory?
- (h) Define directed and undirected graph. $8 \times 2 = 16$

UNIT-I

2. What are the various applications of data structures? Also explain what do you mean by complexity of algorithms? How is it calculated? Explain with suitable examples. 16

3. Write down both the algorithms of pattern matching and explain with appropriate examples. Compare both the algorithms. 16

UNIT-II

4. (a) Differentiate between array and linked list. 6
(b) What is a Sparse matrix? How Sparse matrices are stored in computer memory? Explain with suitable examples. 10
5. (a) Write down the algorithm for searching in a linked list. 8
(b) Write down the algorithm for inserting an element in a doubly linked list. 8

UNIT-III

6. Explain the memory representations of Stack using both arrays and linked list. Also write the algorithm for insertion and deletion in a stack using both the techniques. 16
7. (a) What is a deque? How can we insert and delete an element in a deque? 8
(b) What is priority queue? Explain the memory representation of priority queue in computer memory. 8

UNIT-IV

8. Write an algorithm for traversing a tree using postorder traversal. Also explain the same with the help of suitable example. 16
9. What do you understand by graph? Explain the memory representations of graphs with the help of appropriate examples. Explain some major applications of graph. 16

Roll No.

Total Pages : 2

BCA(12/13)/D-13

726

COMPUTER ARCHITECTURE-I

Paper-BCA-233

Time Allowed : 3 Hours]

[Maximum Marks : 80

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

1. Describe :

- (a) Paper tape
- (b) Flat-panel display
- (c) Polling
- (d) Stack based CPU
- (e) Register transfer language
- (f) Burst mode in DMAC
- (g) Instruction Register
- (h) Status Flags.

8×2=16

UNIT-I

2. Describe :

- (a) Tracker Ball
- (b) OMR
- (c) Touch Screen
- (d) Inkjet Printer.

4×4=16

726/K/62/ 4200

P. T. O.

3. (a) Explain the working of DMA.
(b) Discuss various ways of connecting devices on the wire bus. $2 \times 8 = 16$

UNIT-II

4. How a floating pt. no. is represented in a computer? Represent $(6.5)_{10}$ in a 32-bit location having 24-bits for mantissa and 8-bits for exponent. 16
5. Explain the use of shift operations and explain shift counter. 16

UNIT-III

6. (a) Describe various memory mapping techniques.
(b) Explain various problems related to management of memory hierarchy. $2 \times 8 = 16$
7. (a) Explain the concept of paging and discuss two page replacement methods.
(b) Discuss Cache memory, schemes for Cache organization and multilevel Cache. $2 \times 8 = 16$

UNIT-IV

8. (a) Explain various types of addressing modes.
(b) Explain various registers in a CPU. $2 \times 8 = 16$
9. (a) Explain Stack operations with suitable examples.
(b) Differentiate between vertical and horizontal microprogramming. $2 \times 8 = 16$

Roll No.

Total Pages : 3

BCA(12/13)/D-13

727

INTRODUCTION TO DATABASE SYSTEM

Paper-BCA-234

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : First question is compulsory. A candidate will be required to answer five questions in all, selecting **one** question from each Unit in addition to compulsory question. All questions carry equal marks.

1. Compulsory Question :

- (a) What do you mean by security?
- (b) Define data aggregate.
- (c) Distinguish between entity and attribute.
- (d) Define domain of an attribute.
- (e) Distinguish between composite and atomic attributes.
- (f) What do you mean by storing entity type?
- (g) Define recursive relationship.
- (h) Define view.

UNIT-I

2. (a) Define database. What are the characteristics of database?
- (b) Explain integrated database environment by using example. What are its disadvantages?

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P. T. O.

3. (a) Explain various components of DBMS.
- (b) Explain the duties of database designers and application programmers.

UNIT-II

4. Describe three level architecture of DBMS by using example. What are its advantages?
5. (a) Explain object-based data models.
- (b) What are the reasons for data independence? Explain.

UNIT-III

6. Explain various steps in designing ER diagram. Design a ER diagram for the company database with the following descriptions :
 - (a) The company is organized into departments. Each department has a unique name and a unique number. A department may have several locations.
 - (b) A department controls a number of projects, each of which has a unique name, a unique number and a single location.
 - (c) We store each employee's name, social security number, address and salary. An employee is assigned to one department but may work on several projects, which are not necessarily controlled by the same departments.
 - (d) We want to keep track of the dependents of each employee for insurance purposes. We keep each dependent's name, age and relationship to the employee.

7. (a) Explain hierarchical data model and its operations.
- (b) Explain various types of relationship constraints.

UNIT-IV

8. Distinguish between the following :
 - (a) Primary and secondary key
 - (b) Degree and cardinality
 - (c) Domain and tuple uniqueness constraints
 - (d) Extension and intension.
9. (a) Explain relational data model.
- (b) Explain integrity rule 1 and integrity rule 2 by using example.

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Total Pages : 2

BCA(12/13)/D-13

728

**STRUCTURED SYSTEM ANALYSIS AND
DESIGN**

Paper-BCA-235

Time Allowed : 3 Hours]

[Maximum Marks : 80

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

1. Compulsory Question :

- (a) Physical v/s Abstract system
- (b) Decision table
- (c) Logical system design
- (d) White box testing
- (e) Cost/benefit analysis.

UNIT-I

- 2. Explain various phases of system development life cycle in detail.
- 3. (a) Who is system analyst and what he does in the development of a software system?
(b) What do you mean by man made information system? Explain.

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P. T. O.

UNIT-II

4. What is structured system analysis? Explain tools of structured analysis.
5. Write short notes on the following :
 - (a) Technical feasibility
 - (b) IPO and HIPO charts
 - (c) Interview.

UNIT-III

6. Explain various file organization methods.
7. Explain input form design and output form design for a software system.

UNIT-IV

8. What is testing of a software? Explain various techniques of testing.
9. Write short notes on the following :
 - (a) Software quality assurance levels
 - (b) Software cost reduction.

BCA(12/13)/D-13

729

MATHEMATICAL FOUNDATION-III

Paper-BCA-236

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) Differentiate $\sqrt{\sec\sqrt{x}}$ w.r.t. x . 2
- (b) Find the derivative of $y = \log(\sin x)$ w.r.t. x . 2
- (c) Find ϕ for the curve $r = a(1 - \cos\theta)$. 2
- (d) Define Taylor's theorem with Cauchy's form of remainder. 2
- (e) Show that the function $f: \mathbb{R}^2 \rightarrow \mathbb{R}$ defined by
- $$f(x, y) = \begin{cases} \frac{x^2 - y^2}{x^2 + y^2} xy & , (x, y) \neq 0 \\ 0 & , \text{otherwise} \end{cases}$$
- is continuous at $(0, 0)$. 2
- (f) Define Concavity and Convexity. 2
- (g) Define Symmetry about origin. 2

UNIT-I

2. (a) Find $\frac{dy}{dx}$, where $y = x^x + (x)^{\sin x}$. 8
- (b) Differentiate $\tan^{-1} \frac{\sqrt{1+x^2}-1}{x}$ w.r.t. $\sin^{-1} \frac{2x}{1+x^2}$. 8
3. (a) Find nth derivative of $\sin^3 x$. 8
- (b) If $y = (\sin^{-1} x)^2$.
 Prove that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} + n^2y_n = 0$. 8

UNIT-II

4. (a) Show that the two circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ touch if $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c}$. 8
- (b) Find the length of tangent, normal, sub tangent and sub normal to $x = a \cos^3 \theta$ and $y = a \sin^3 \theta$ at the point θ . 8
5. (a) Show that $\left(x - \sqrt{1+x^2} \right)^n = 1 + nx + \frac{n^2 x^2}{2!} + \frac{n(n^2-1^2)x^3}{3!} + \frac{n(n^2-2^2)x^4}{12} + \dots$ 8

- (b) Evaluate the following :

$$\lim_{x \rightarrow 0} \left(\frac{1}{x^2} - \frac{1}{\tan^2 x} \right).$$

8

UNIT-III

6. (a) Find all asymptotes to the curve $x^2y - xy^2 + xy + y^2 + x - y = 0$. 8
- (b) Find asymptote of the curve $r = a \sec \theta + b \tan \theta$. 8
7. (a) Find the position and nature of double points of the curve $x^3 + x^2 + y^2 - x - 4y + 3 = 0$. 8
- (b) Find point of inflexion on the curve $x = a(2\theta - \sin \theta)$, $y = a(2 - \cos \theta)$. 8

UNIT-IV

8. (a) If ρ_1 and ρ_2 are radii of curvature at the extremities of a focal chord of a parabola whose latus rectum is l , prove that $(\rho_1)^{\frac{-2}{3}} + \text{and } (\rho_2)^{\frac{-2}{3}} = (l)^{\frac{-2}{3}}$. 8
- (b) Find the radius of curvature at the origin of the two branches of the curve given by $x = 1 - t^2$, $Y = t - t^3$. 8
9. (a) Trace the curve $x^4 + y^4 = a^2xy$. 8
- (b) Trace the curve $r = a(1 - \sin \theta)$. 8