

No. of Printed Pages : 03

Roll No.

20B741

B.C.A. EXAMINATION, 2022

(Second Semester)

(C Scheme) (Main & Re-appear)

BCA

BCA102C

Digital Design

Time : 3 Hours]

[Maximum Marks : 75

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

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. Convert the following hex numbers to octal numbers :
 - (a) A72E
 - (b) 0.BF85
2. (a) What is the largest binary number that can be obtained with 16 bits ? What is its decimal equivalent ?
 - (b) Convert the following decimal numbers to the indicated bases :
 - (i) 7562.45 to octal
 - (ii) 175.175 to binary

Unit II

3. (a) Minimize the following expressions using K-maps and realize using NOR gates only :
$$f_1 (A, B, C, D) = \pi M (1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15)$$

- (b) Prove the following using the Boolean algebraic theorems :

$$\bar{A}BC + A\bar{B}C + AB\bar{C} + ABC = AB + BC + CA$$

4. Differentiate between fixed point and floating point representation of a number with suitable examples.

Unit III

5. What are Universal Gates ? Why are these Gates called universal gates ? Describe with the help of truth table.
6. Explain basic concept and difference between SOP and POS.

Unit IV

7. Design a BCD to Excess-3 code converter using minimum number of NAND gates.
8. Write short notes on the following :
 - (a) Master and Slave Flip-Flop
 - (b) Multiplexer and Demultiplexer.

8. Show with the help of an example how graphs are represented in memory. Give merits and demerits of each representation scheme. 15
9. (a) What are AVL trees ?
(b) What is an Array ? Explain.
(c) Give three applications of stack.
(d) Define circular list.
(e) What are abstract data types ? 15

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BCA

BCA104C

Data Structure Using C

Time : 3 Hours]

[Maximum Marks : 75

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Note : Attempt *Five* questions in all. Q. No. 9 is compulsory. All questions carry equal marks.

Unit I

1. What is a Data structure ? In what different ways can the data structures be categorized ? Discuss the different applications of data structures. 15
2. (a) Discuss time space trade off giving examples. 7
(b) Write an algorithm to search an element using linear search. What is the complexity of linear search algorithm ? 8

Unit II

3. (a) Write the procedure to delete an element from an array. 8
(b) Write an algorithm to insert a node in the beginning of a linked list. 7
4. (a) Compare the working of insertion sort and selection sort. 8
(b) What are the main advantages of linked lists over arrays ? 7

Unit III

5. (a) Consider the following arithmetic expression P written in infix notation
$$P : A + (B * C - (D/E \wedge F) * G) * H.$$
Convert the expression P into postfix notation using Stacks. 8
(b) What are the main operations that can be performed on stacks ? Explain with the help of an example. 7
6. (a) Differentiate between stacks and queues. Quote example. 8
(b) Explain Deque. How is a Deque represented in memory ? 7

Unit IV

7. (a) Explain the Shortest Path algorithm for graphs with the help of an example. 8
(b) Explain how the following elements are inserted in a tree : 7

A, V, L, T, R, E

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BCA

BCA106C

Database Management System

Time : 3 Hours]

[Maximum Marks : 75

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Note : Attempt *Five* questions in all. Q. No. 9 is compulsory. All questions carry equal marks.

Unit I

1. (a) Explain the functioning of DBMS.
(b) Describe the role of database designer.
2. (a) Describe Database Languages with examples.
(b) Write down applications of Database Environment.

Unit II

3. (a) Explain conceptual and internal levels of DBMS.
(b) What is Schemas ? Explain.
4. (a) Explain Centralized and Client Server Architecture of DBMS.
(b) Write short note on mappings and instances.

Unit III

5. (a) Explain Object-Oriented Model of DBMS.
(b) Write down working of network data model.

6. (a) Explain properties of Relations.
(b) What are the integrity constraints over relations ?

Unit IV

7. (a) Explain Transaction Management.
(b) What is Concurrency Control ? Explain with a problem.
8. (a) Explain Deadlocks and locking protocols.
(b) What are data types ? Explain.

(Compulsory Question)

9. Explain the following :
 - (a) Application developers and users
 - (b) Three levels of architecture
 - (c) Entity Sets
 - (d) Abstraction and Integration
 - (e) ACID properties.

- (c) Give antonyms of the following words
(do any *four*) : 4
- (i) Able
 - (ii) Hard
 - (iii) Agree
 - (iv) Minimum
 - (v) Oral.

Unit II

3. Write notes on any *two* of the following :
- (a) Proxemic Communication
 - (b) Kinesic Communication
 - (c) Chronomatic Communication. $7\frac{1}{2} \times 2 = 15$
4. Write notes on any *two* of the following :
- (a) Telephone Etiquettes
 - (b) Business Etiquettes
 - (c) Dining Etiquettes. $7\frac{1}{2} \times 2 = 15$

Unit III

5. What are the things that you must keep in mind while planning for an employment (Job) interview ? 15

20B745

B.C.A. EXAMINATION, 2022

(Second Semester)

(C Scheme) (Main & Re-appear)

BCA

HUM202BC

Communication Skill-II

Time : 3 Hours]

[*Maximum Marks : 75*

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Note : Attempt *Five* questions in all. Q. No. 9 is compulsory. All questions carry equal marks.

Unit I

1. Do as directed : **10**

(a) One word substitution (Attempt any *ten*) :

- (i) One who knows everything
 - (ii) One who abstains from alcohol
 - (iii) One who looks at the bright side of things
 - (iv) One who is liked by everybody
 - (v) Medical examination of a body held after the death
 - (vi) One who eats vegetables only
 - (vii) One who cannot read or write
 - (viii) Study of environment
 - (ix) One which cannot be corrected
 - (x) A list of books
 - (xi) Fit to be eaten
 - (xii) A place where clothes are kept.
- (b) (i) Write any *five* silent letter words (e.g. Comb where "b" is silent).

(ii) Make at least two words beginning with : **5**

- (i) Abs...
- (ii) Cam...

2. (a) Distinguish the following pair of words by making sentences (do any *seven*) : **7**

- (i) Beside, Besides
- (ii) Weak, Week
- (iii) Road, Rode
- (iv) Meet, Meat
- (v) Waste, Waist
- (vi) Lesson, Lessen
- (vii) Dairy, Diary
- (viii) Die, Dye
- (ix) Heat, Heel.

(b) Give synonyms of the following words (do any *four*) : **4**

- (i) Begin
- (ii) Danger
- (iii) Join
- (iv) Old
- (v) Love.

- (c) Write any *two* elevator etiquettes. 2
- (d) How body language is important ? 2
- (e) Write any *two* steps for PowerPoint presentation. 2
- (f) Write any *two* Don'ts of presentation. 2
- (g) What is the layout of Memorandum ? 2
- (h) Important steps for Drafting the report. 2

6. Read the passage below and answer the questions that follows it : $5 \times 3 = 15$

Speech and language have contrasting advantages and disadvantages. Speech can be changed, even while being uttered, to fit the mood, audience and occasion; language cannot be so changed, for once printed, it is unchangeable and cannot be brought up to date without the necessity of a revised edition. Audible speech is augmented by its own possibilities of variation in pitch (intonation), force, volume and intensity, and by the simultaneous aid of the visual facial, gestural and postural code; language has none of the aids when read silently, and it is at the mercy of the voice and pantomime of the reader when read aloud. Speech stands to fall on its single momentary utterance - unless, perhaps the speaker repeats what he has just said, or expounds it - and the bearer cannot stop to think upon a statement, for fear of losing the

next statement; language may be read and reread, pondered upon and discussed at any point, without danger of losing what follows on the next page.

- (i) What advantages does speech enjoy over-writing ?
- (ii) What is the disadvantage that speech suffers from in comparison with written language ?
- (iii) Explain : "Speech stands or falls on its single momentary utterance."
- (iv) "Gestural" is an adjective formed from "gesture". There are two other words in the passage similarly formed from nouns. Find out these words and give their noun forms.
- (v) What advantage does written language enjoy over speech ?

Unit IV

7. What is the significance of Business Communication ? 15

Or

Write a letter of complaint to a firm that the goods sent by it were defective and ask for a free replacement. 15

8. What is a Formal Report ? Write a brief review of some of the types of reports, their uses and formats. 15

Unit V

- 9, Do as directed :
- (a) Make new words using the following prefix : 1½
 - (i) Non...
 - (ii) Super
 - (iii) Inter...
 - (b) Make new words using the following suffix : 1½
 - (i) ...able
 - (ii) ...full
 - (iii) ...ous

5. (a) Given the following pairs of values :

Capital Employed (Crores of Rs.)	Profits (Lakhs of Rs.)
2	6
3	5
5	7
6	8
8	12
9	11

Make a scatter diagram and check whether is any correlation between profits and capital employed ?

- (b) Two judges in a beauty competition rank the 12 entries as follows :

X	Y
1	12
2	9
3	6

20B744

B.C.A. EXAMINATION, 2022

(Second Semester)

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BCA

MATHS112C

Mathematics–II

Time : 3 Hours]

[Maximum Marks : 75

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Note : Attempt *Five* questions in all. Q. No. 9 is compulsory. All questions carry equal marks.

Unit I

1. (a) Evaluate :

$$\lim_{x \rightarrow 0} f(x)$$

where :

$$f(x) = \begin{cases} \frac{|x|}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

- (b) Suppose :

$$f(x) = \begin{cases} a + bx, & x < 1 \\ 5, & x = 1 \\ b - au, & u > 1 \end{cases}$$

and if $\lim_{x \rightarrow 1} f(x) = f(1)$, what are possible values of a and b ?

- (c) Evaluate $\lim_{x \rightarrow \pi/2} \frac{\tan 2x}{x - \pi/2}$.

2. (a) Find all points of discontinuity of f , where f is defined by :

$$f(x) = \begin{cases} \frac{x}{|x|} & \text{if } x < 0 \\ -1 & \text{if } x \geq 0 \end{cases}$$

- (b) The sum of the reciprocals of Tony's ages in (years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

Unit II

3. (a) A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine :
- P (1 or 3)
 - P (not 3).
- (b) A card is drawn from a well shuffled pack of playing cards. Find the probability that it is either a diamond or a king.
4. (a) An urn contains four balls. Two balls are drawn at random and are found to be white. What is the probability that all the balls are white ?
- (b) Define the following with examples :
- Simple event
 - Compound event.

- (d) State the nature of the following correlations (positive, negative or no correlation) :
- (i) Sale of woollen garments and the day temperature.
- (ii) The color of the Saree and the intelligence of the lady who wear it.
- (e) Find the roots of the equation $2x^2 + x - 6 = 0$, by factorization.
- (f) Find a quadratic polynomial with the sum and product of its zeros, given by $\frac{1}{4}$ and -1 respectively.

4	10
5	3
6	5
7	4
8	7
9	8
10	2
11	11
12	1

What degree of agreement is there between the two judges ?

6. (a) Distinguish between correlation and regression analysis and indicate the utility of regression analysis in economic activities.
- (b) The following data give the experience of machine operators and their performance ratings as given by the

number of good parts turned out per 100 pieces :

Operator	Experience (in years)	Performance Ratings
	(X)	(Y)
1	16	87
2	12	88
3	18	89
4	4	68
5	3	78
6	10	80
7	5	75
8	12	83

Calculate the regression line of performance ratings on experience.

Unit IV

7. (a) Find the slope of a line, which passes through the origin, and the midpoint of the line segment joining the points P (0, - 4) and B (8, 0).

- (b) Find the equation of the line passing through the point (2, 2) and cutting off intercepts on the axes whose sum is 9.

8. (a) Find the equation of the right bisector of the line segment joining the points (3, 4) and (- 1, 2).
 (b) Find angles between the lines $(\sqrt{3}x + y) = 1$ and $x + \sqrt{3}y = 1$.

(Compulsory Question)

9. (a) Find the value of x for which the point $(x, - 1)$, $(2, 1)$ and $(4, 5)$ are collinear.
 (b) Describe the sample space for the following experiments :
 A coin is tossed and then a die is rolled only in case a head is shown on the coin.
 (c) A die is rolled. Let E be the event "die shows u " and F be the event "die shows even number". Are E and F mutually exclusive ? Give your reasoning also.