S–4416

Sub. Code
23BCA1C1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Application

PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions

1. What are the keywords in Python?
2. Difference between variables and constants in Python.
3. What is meant by condition if?
4. Explain break statement in python.
5. What is the use of str.upper( ) and str.lower( ) functions in string?
6. Explain function call in python.
7. Explain how to create dictionary in python.
8. What is the function of append( ) in List?
9. How to open a new file in python?
10. Which method is used to read the content of a file?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain data types in python.

Or

(b) Explain identifiers and keywords in python with example.

12. (a) Explain nested loops with suitable example.

Or

(b) Explain pass statement with example program.

13. (a) Explain python string operations.

Or

(b) Explain python function call.

14. (a) What are the methods that are used in python tuple?

Or

(b) What is the advantage of tuple over list?

15. (a) Explain file methods in python.

Or

(b) How to renaming and deleting files in python.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain operators and expressions in python.

17. Explain conditional branching statement in python.

18. Write a python program for Recursive function call.

19. Explain basic list operations.

20. Explain reading, writing and closing process in python files.

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S–4417

Sub. Code
23BCAA1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Computer Application

Allied — DIGITAL LOGIC FUNDAMENTALS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is the purpose of binary codes in digital systems?

2. Convert the binary number 1101 into its hexadecimal equivalent.

3. What is the purpose of an arithmetic logic unit (ALU) in digital systems?

4. Differentiate between Sum of Products (SOP) and Product of Sums (POS).

5. Define the purpose of a decoder in digital circuits.

6. Explain the difference between an encoder and a decoder.

7. Define the purpose of a D flip-flop.

8. What is a shift register in digital circuits?

9. Define ring counter, and where is it commonly used.

10. What does “MOD” represent in the context of counters?

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Construct the truth table for a 3-input OR gate and explain how it operates.

Or

(b) Discuss the role of logic gates in digital circuits. How do they influence the design of digital systems?

12. (a) Explain the process of simplifying a Boolean function using Boolean algebra laws.

Or

(b) Explain the concept of two's complement and its significance in binary arithmetic operations.

13. (a) Illustrate the operation of Multiplexer and Demultiplexer.

Or

(b) Explain how a BCD to Gray code converter functions with a block diagram.

14. (a) How does a D flip-flop work, and why is it often used in memory storage?

Or

(b) Discuss the advantages and disadvantages of using a T flip-flop in sequential circuits.

15. (a) Compare and contrast different types of ROM (PROM, EPROM. EEPROM).

Or

(b) How does an MOD-10 counter operate? Provide a block diagram and its application.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the design and operation of a digital circuit using universal gates (NAND or NOR gates) with the truth table and logic diagram.

17. Explain the method of using a K-map for simplifying a Boolean function with four variables. Include a detailed example and the step-by-step process.

18. Discuss about the design and working methodology of a Gray to Binary code converter.

19. Describe the concept of a master-slave flip-flop in detail.

20. Explain the concept of memory in digital systems.

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S–4418	Sub. Code
	23BCA1S1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024.

First Semester

Computer Application

WEB DESIGNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write the structure of HTML program.

2. Explain the use of COMMENT tag.

3. Write the simple syntax to insert a image using HTML.

4. List the common video formats that can Be embedded with HTML.

5. What are the benefits of using CSS?

6. What is Entity Reference?

7. What is DHTML?

8. Why we use Javascript?

9. What is Advanced Javascript?

10. How do web browsers run in javascript?

Part B (5 × 5 = 25)

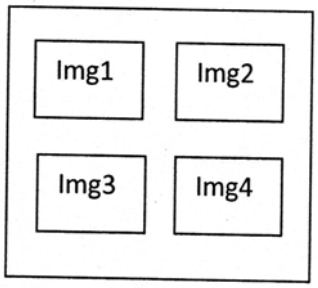
Answer **all** questions, choosing either (a) or (b).

11. (a) Explain any five attributes of TABLE tag in HTML.

Or

(b) What are Hyperlinks and how will you create it using html tags?

12. (a) Write a HTML code to list create the following design.



Or

(b) Explain the two methods used in HTML FORM.

13. (a) Define grouping styles and its uses.

Or

(b) "XML is platform independent and language independent." Justify.

14. (a) Explain about JavaScript variables with examples.

Or

(b) Illustrate the working of DCOM.

15. (a) What are Javascript own objects?

Or

(b) What is Data binding? Depicts its working through a diagram.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Illustrate the types of list in HTML.

17. What is a HTML form? Enumerate the form attributes with their uses.

18. What are the three types of CSS? Explain each type with example.

19. Write a JavaScript program to find factorial of a given number using function.

20. Write a JavaScript code to perform form validation by checking the given HTML input is empty or non empty.

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S–4419	Sub. Code 23BCA1FC

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Application

STRUCTURED PROGRAMMING IN C

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is character set?

2. What is a unary operator? Give example.

3. Specify the syntax used for 'while' statement.

4. Mention the use of' 'break' and 'continue' statements.

5. What are an array and its types?

6. How to initialize Multi dimensional arrays?

7. Differentiate call by value and call by reference.

8. What are the various dynamic memory allocation functions?

9. What is a pointer?

10. Write the features of a pointer.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain all types of constants.

Or

(b) Explain Relational and bitwise operators.

12. (a) Explain do-while and 'goto' statement with examples and syntax.

Or

(b) Write a program for to calculate factorial number using 'for' loop.

13. (a) What is an array? How a single dimension and two dimension arrays are declared and initialized?

Or

(b) Write a program in C to store elements in an array and print them.

14. (a) Write a program for multiply two numbers using user defined functions based on parameter passing and no return value.

Or

(b) Explain storage classes in C programming with an example.

15. (a) Explain how the pointer variable declared and initialized.

Or

(b) Write a program for to find the biggest number using pointers.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain a general structure of C program with an example.

17. How to declare 'for' loop and switch-case expressions with example program

18. Write an algorithm and develop a C program that reads N integer numbers and arrange them in ascending order using selection Sort.

19. What is recursion? Explain. Write a c-program using recursive function for to finding Factorial number.

20. Explain the concept of Pointer to one dimensional Array.

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S–4420	Sub. Code
	23BCA2C1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Application

OBJECT ORIENTED PROGRAMMING CONCEPT USING C++

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write the benefits of OOPS.
2. Write the structure of C++ program.
3. Explain function prototyping in C++.
4. Give a short note on member function.
5. Explain destructor in C++.
6. What is inheritance?.
7. Simply explain the “This pointer” in C++.
8. Write the command line argument syntax.
9. Explain defined templates.
10. Write a short note on error handling in C++.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the user defined data types in C++.

Or

(b) Write a simple program on Operator over loading.

12. (a) Describe the call by reference in C++.

Or

(b) Explain Static member function with suitable program.

13. (a) Discuss the importance of Constructors with default arguments.

Or

(b) Write a simple program for multiple inheritances.

14. (a) What is a Pure virtual function?

Or

(b) Explain the Class for file stream operations.

15. (a) Briefly explain the nesting of function calls.

Or

(b) Give a note on Catch all exceptions.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the tokens, keywords and identifiers and constants in C++.

17. Illustrate the Arrays with in a class.

18. Discuss the Constructor in derived classes.

19. Elaborately explain the Error handling during file operations.

20. Describe the uses of Exceptions in constructors and destructors.

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S–4421

Sub. Code
23BCAA2

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Computer Applications

Allied – RESOURCE MANAGEMENT TECHNIQUES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions

1. What are the different phases of operation Research?

2. Define optimal feasible solution.

3. Explain Least cost Method

4. Define Degenerate basic feasible solution.

5. Explain Transshipment problem

6. Define unbalanced assignment problem

7. Define Idle Time on a machine.

8. What is sequencing problem.

9. What is Critical path?

10. Explain Total float and free float.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain Main phases of operation Research.

Or

(b) A firm manufactures two type of products *A* and *B* and sells them at a profit of Rs. 2 on type *A* and Rs. 3 on type *B*. Each product is processed on two machines *G* and *H*. Type *A* requires one minute of processing time on *G* and two minutes on *H*; Type *B* required one minute on *G* and one minute on *H*. The machine *G* is a available for not more than 6 hour 40 minutes while machine *H* is available for 10 hours during any working day. Formulate the problem as a LPP.

12. (a) Explain Mathematical formulation of Transportation problems.

Or

(b) Find initial basic feasible solution by VAM Method.

	D_1	D_2	D_3	D_4	Available
S_1	11	13	17	14	250
S_2	16	18	14	10	300
S_3	21	24	13	10	400
Requirements	200	225	275	250	

13. (a) Explain Hungarian method procedure for assignment problem.

Or

(b) Solve the assignment problem.

	A	B	C
1	10	7	8
2	8	9	7
3	7	12	6
4	10	10	8

14. (a) Explain Johnson's Algorithm for n jobs 2 machines.

Or

(b) We have seven jobs each of which has to go through the machine M_1 and M_2 in the order M_1, M_2. Processing times are given below

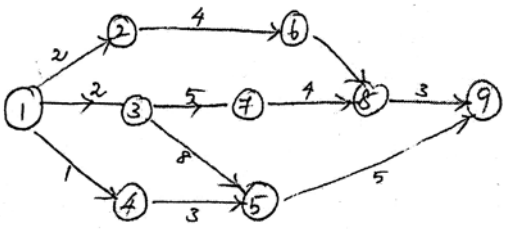
Job	1	2	3	4	5	6	7
Machine M_1	3	12	15	6	10	11	9
Machine M_2	8	10	10	6	12	1	3

Determine a sequence of three jobs that will minimize the total elapsed time T.

15. (a) Write difference between PERT and CPM.

Or

(b) Find the Critical path and Calculate the slack time for each event for the following PERT diagram.



Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Solve the LPP by Graphical Method.

Maximize $= 120x_1 + 100x_2$,

subject to the Constraints

$10x_1 + 5x_2 \leq 80$
$6x_1 + 6x_2 \leq 66$
$4x_1 + 8x_2 \geq 24$
$5x_1 + 6x_2 \leq 90$
$x_1 x_2 \geq 0$

17. Solve the transportation problem

	D_1	D_2	D_3	D_4	D_5	a_i
O_1	73	40	09	79	20	8
O_2	62	93	96	08	13	7
O_3	96	65	80	50	65	9
O_4	57	58	29	12	87	3
O_5	56	23	87	18	12	5
b_j	6	8	10	4	4	

18. Solve the Assignment problem

	J_1	J_2	J_3	J_4	J_5
M_1	7	5	9	8	11
M_2	9	12	7	11	10
M_3	8	5	4	6	9
M_4	7	3	6	9	5
M_5	4	6	7	5	11

19. We have five jobs each of which must go through machines *A, B* and *C* in the Order *ABC*. if Find Idle time for each machine.

Job No.	1	2	3	4	5
Machine A	5	7	6	9	5
Machine B	2	1	4	5	3
Machine C	3	7	5	6	7

Determine a sequence for the jobs that will Minimize the total Elapsed

20. A project has the following time schedule

Activity	Time in months	Activity	Time in months
(1—2)	2	(5—6)	3
(1—3)	2	(5—8)	1
(1—4)	1	(6—9)	5
(2—5)	4	(7—8)	4
(3—6)	8	(8—9)	3
(3—7)	5		

(a) Construct PERT network

(b) Find Total float for each activity and

(c) Find critical path and its duration.

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S–4422

Sub. Code
23BCA2S1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Computer Application

FUNDAMENTALS OF INFORMATION TECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between Hardware and Software.

2. Write any two uses of computer.

3. What are the main components of MS Word?

4. Comment on Hyperlink.

5. What is the use of AutoFill option in MS Excel?

6. How can you insert a row in a table?

7. What is the use and advantage of master slides?

8. How to apply transition to the slides?

9. Expand URL and WWW.

10. Comment on Domain Name.

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) Outline of various Generations of Computer.

Or

(b) Describe any two Output devices.

12. (a) Write down the steps to change text font in MS-Word.

Or

(b) Write shortcut keys for the following :

(i) open a file (ii) print a file (iii) save a file (iv) paste a text (v) cut a text.

13. (a) Describe any five features of MS-Excel.

Or

(b) Comment on :

(i) Sum (ii) Count (iii) Average (iv) Min (v) Max function with example.

14. (a) Write a short note on slide transition in MS-Power point.

Or

(b) Write down the steps for inserting audio and video in Power point slide presentation.

15. (a) Discuss the Merits and Demerits of Digital Signatures.

Or

(b) Brief note on Digital Currency.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Briefly explain the different types of operating system.

17. Mention the procedure involved in creating table in word.

18. Discuss the different types of charts in Excel.

19. Summarize the various features of MS- Power point.

20. Give a brief note on basic components of email.

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S–4423

Sub. Code
23BCA2S2

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Application

MULTIMEDIA SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer all the questions.

1. What is Multimedia?

2. What is Hypermedia?

3. What is Image File Format?

4. Define Digital Audio.

5. What is an Animation?

6. What is video editing?

7. What is a Multimedia Project?

8. Define Authoring.

9. What is Scheduling?

10. What is Bid Proposal?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) List the benefits of Multimedia.

Or

(b) Discuss about Font Faces.

12. (a) What is Plan approach for Images?

Or

(b) Explain how sounds are added to multimedia.

13. (a) Discuss on how Animations are made.

Or

(b) Write a note on Digital Video Controllers.

14. (a) Explain the intangible needs of Multimedia.

Or

(b) Write a note on the Production Team.

15. (a) What is Designing and Producing?

Or

(b) Write briefly on Acquiring Talent.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss how text is used in Multimedia.

17. Discuss the Multimedia System Audio file Formats.

18. Explain the Principles of Animation.

19. Discuss the Stages of Multimedia Project.

20. Explain the process of making Multimedia.

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S–4424

Sub. Code
23BCAA3

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Computer Application

Allied — DISCRETE MATHEMATICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. Define the power set with an example.

2. Give an example of a relation that is neither reflexive nor irreflexive.

3. State the order of precedence for logical connectives.

4. Prove that $(P \to (P \vee Q))$ is a tautology.

5. Symbolize the statement
   "All the world loves a lover".

6. Define conjunctive normal form.

7. Define a weighted graph with an example.

8. When will you say the graph will be bipartite?

9. Draw all the spanning trees of K_3.

10. Define sub boolean algebra.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) For any two sets A and B, Prove that

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

(ii) $A\subset B \Leftrightarrow A\cap B=A$.

Or

(b) Let $f(x)=x+2$, $g(x)=x-2$ and $h(x)=3x$ for $x\in R$, where R is the set of real numbers. Find $f\circ g, g\circ f, f\circ h, h\circ g, f\circ g\circ h$.

12. (a) Construct the truth table for the following statement :

$\neg(P\vee(Q\wedge R))\leftrightarrow((P\vee Q)\wedge(P\vee R))$.

Or

(b) Write the converse, inverse and contrapositive of the conditional statement, "If two integers are equal then their squares are equal".

13. (a) Discuss the principles of normal form.

Or

(b) Show that $(x)\ (P(x)\vee Q(x))\Rightarrow (x)\ P(x)\vee\ (\exists x)\ Q(x)$.

14. (a) Draw a graph with 5 nodes A, B, C, D, E such that $\deg(A)=3$, B is an odd node, $\deg(C)=2$ and D and E are adjacent.

Or

(b) Discuss the WARSHLL Algorithm in detail.

15. (a) Explain Prim's algorithm with an example.

Or

(b) In any Boolean algebra show that $ab'+a'b=0 \Leftrightarrow a=b$.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Determine whether the elation R on the set of all integers is reflexive, symmetric and / or transitive where aRb if and only if

    (a) $a \neq b$

    (b) $ab \geq 1$

    (c) 'a' is a multiple of b

    (d) $a = b^2$.

17. Show that $\neg(P \wedge (\neg P \wedge Q))$ and $(\neg P \vee \neg Q)$ are logically equivalent without using a truth table.

18. Find the principal disjunctive normal form and principal conjunctive normal form of

    $(P \wedge Q) \vee (\neg P \wedge Q) \vee (Q \wedge R)$.

19. Prove that in a simple digraph G, every node of the digraph lies in exactly one strong component.

20. Write the following Boolean expressions in an equivalence sum-of-products canonical form in three variables x_1, x_2 and x_3 :

    (a) $x_1 * x_2$;

    (b) $x_1 \oplus x_2$;

    (c) $(x_1 \oplus x_2)' * x_3$.

S–4426

Sub. Code
23BCAA5

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Computer Application

Allied – GRAPH THEORY AND ITS APPLICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions

1. Define a walk concerning graph.

2. What is a Hamilton Circuit?

3. What is meant by a non-separable graph?

4. What are the applications of planar graphs?

5. Define proper Coloring?

6. What is meant by Asymmetric Digraph?

7. Define the incidence matrix of a graph.

8. What do you mean by weighted graph?

9. What is graph coloring with k colors?

10. What do you mean by shortest path?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain about graphs and applications of graphs.

Or

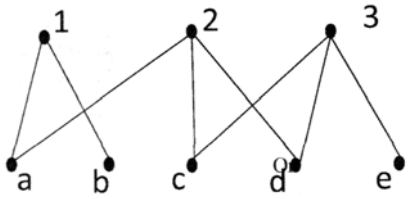
(b) Prove that in any tree (with two or more vertices), there are at least two pendant vertices.

12. (a) Explain the connectivity and separability.

Or

(b) Prove that the maximum flow possible between two vertices a and b in a network is equal to the minimum of the capacities of all cut-sets with respect to a and b.

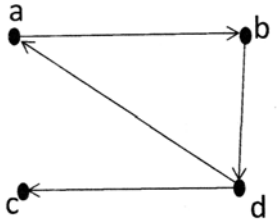
13. (a) Does the following graph have maximal matching? If so, list them with reasons.



Or

(b) Explain in detail about binary relations on digraphs with examples.

14. (a) Discuss the transitive closure of digraph and also write the transitive closure of the following digraph



Or

(b) Write down the steps followed to construct the spanning tree of a graph.

15. (a) Discuss the algorithm for the shortest path from a specified vertex to another vertex.

Or

(b) Why is the four color problem important? Explain in detail.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Prove that A given connected graph G is an Euler graph if and only if all vertices of G are of even degree.

17. Prove that, a connected planar graph with n vertices and e edges has $e - n + 2$ regions.

18. Define chromatic polynomial. And prove the following:

(a) A graph of n vertices is a complete graph if and only if its chromatic polynomial is $P_n(\lambda) = \lambda(\lambda-1)(\lambda-2)-(\lambda-n+1)$.

(b) An n-Vertex graph is a tree if and only if its chromatic polynomial

$P_n(\lambda) = \lambda(\lambda-1)^{n-1}$

19. Explain Prim's minimal spanning tree algorithm with examples.

20. Discuss the traveling salesman problem of the directed graph with a suitable examples.

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S–4428

Sub. Code
23BCA3C1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Application

DATA STRUCTURES AND ALGORITHMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is an Abstract Data Type (ADT)?
2. Define a List ADT and its key operations.
3. What is a Queue ADT and how does it differ from a stack?
4. What is the significance of a dequeue in queue operations?
5. Define AVL tree.
6. Define in-order traversal in the context of binary trees.
7. What is the difference between a directed and an undirected graph?
8. What is an adjacency matrix and how is it used to represent a graph?
9. Define Hash function.
10. What do you mean by Open Addressing.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the operations of insertion and deletion in a doubly linked list, with examples.

Or

(b) Explain how linked lists can be used to perform polynomial addition, including a brief example.

12. (a) Describe the various operations that can be performed on a queue.

Or

(b) Explain how a priority queue is implemented and provide an example of its application.

13. (a) Describe the pre-order, in-order and post-order tree traversal techniques.

Or

(b) Discuss the structure and application of B-trees in database indexing.

14. (a) Describe the algorithms for Breadth-First Traversal (BFS).

Or

(b) Explain the adjacency list representation of a graph with an example.

15. (a) Write a short note on Hash functions.

Or

(b) Discuss shortly on Shell sort.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the various applications of linked lists in real-world scenarios.

17. Explain the concept of a circular queue.

18. Describe about a Binary Search Tree (BST).

19. Discuss in detail on Euler circuits and Euler paths in graphs.

20. Elaborate selection sort and its algorithm.

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S–4429

Sub. Code
23BCA3S1

B.C.A. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Applications

SOFTWARE TESTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions

1. Define software testing?
2. Write the purpose of software testing.
3. How is path testing is performed?
4. List the various software testing methods?
5. Draw a flow chart for data flow testing.
6. Write the reason for resolving bugs and its importance.
7. What is white box testing?
8. Where is decision table is used in logic based testing.
9. Define state graph.
10. What is translation testing?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write about quality in software testing.

Or

(b) Write the difference between testing and debugging.

12. (a) Define bug? Explain with various types of bugs.

Or

(b) Describe in detail the Flow/graphs.

13. (a) Write on domain and interface testing.

Or

(b) Explain the characteristics of test cases.

14. (a) Write a short note on decision tables and structures.

Or

(b) Describe path expressions based on predicates and relational operators.

15. (a) Write a short note on logic-based testing.

Or

(b) What the various structural metrics during testing?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write in detail on model for testing and explain with architectural diagram.

17. Briefly explain the instrumentation and application of path testing.

18. What is data flow testing? Explain its strategies and terminologies.

19. Describe the role of syntax testing and how it is performed.

20. Explain in detail on translation testing based on states and graphs.

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S–4430

Sub. Code
23BCA3S2

B.C.A DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Application

BIOMETRICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the advantages and disadvantages of using face biometrics for authentication?

2. What are the applications of Biometrics?

3. What are the application areas of Iris Biometrics?

4. How fingerprint recognition system works?

5. What are the potential privacy benefits of using soft biometrics?

6. Define Data Encryption.

7. Define Spatial domain.

8. What do you mean by frequency domain water marking?

9. Define RFID.

10. What is Information Security?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) What are the challenges and limitations associated with retina and iris biometrics?

Or

(b) Describe in detail on Face detection in video sequences.

12. (a) Write short notes on concept of privacy-preserving matching

Or

(b) What are minutiae points in fingerprint recognition, and how are they extracted from fingerprint images?

13. (a) Compare different biometric modalities (e.g., fingerprint, iris, face) in terms of their privacy implications.

Or

(b) Define soft biometrics and explain how they differ from traditional biometrics.

14. (a) Explain briefly on different methods for embedding watermarks into digital content?

Or

(b) What are the key characteristics to consider when designing a watermark? Explain briefly.

15. (a) Discuss in detail on Smart card technology.

Or

(b) Elucidate in detail on various biometrics standards.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. How are retina and iris biometrics in various applications, such as access control and healthcare applications?

17. Explain the purpose of fingerprint indexing and common indexing techniques used.

18. Discuss the advantages and challenges of using face and ear biometrics in a multimodal system.

19. Describe in detail on various attacks on spatial domain watermarking.

20. Summarize the comparison of various biometric techniques.

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