

This question paper contains 2 printed pages.

B.C.A. (Part - II)

206/236-A

Roll No.

Obj.Ori.Pro.Con.

B.C.A. (Part - II) EXAMINATION, 2021

(Faculty of Science)

(Three - Year Scheme of 10+2+3 Pattern)

300315

OBJECT ORIENTED PROGRAMMING CONCEPTS (Through C++)

Time Allowed : Three Hours

Maximum Marks : 100

Answers of **all** the questions (Short answer as well as descriptive) are to be given in the main answer-book only. Answers of Short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

Question paper consists of **three** parts. All three parts are **compulsory**.

PART - I : (Very short answer) consists of **10** questions of **two** marks each. Maximum limit for each question is upto **40** words.

PART - II : (Short answer) consists of **5** questions of **four** marks each. Maximum limit for each question is upto **80** words.

PART - III : (Long answer) consists of **5** questions of **twelve** marks each answer **one** question from each unit, each question is with an internal choice.

PART - I

10x2=20

1. Attempt all the questions.
 - (a) What is OOP ?
 - (b) Write any two advantages of OOP.
 - (c) What do you mean by type conversion ?
 - (d) What is ternary operator ?
 - (e) What is 'this' pointer ?
 - (f) What is member data and member function ?
 - (g) What is Inheritance ?
 - (h) What is late binding ?
 - (i) What is binary file ?
 - (j) What is template ?

PART - II

5x4=20

- Attempt all the questions.
2. Explain in brief evolution of OOP.
3. What is an expression ? Explain logical expression with example.
4. What is access specifiers ? Explain each.
5. What is pure virtual function ? Explain with example.
6. What is function template ? Write the syntax with example.

PART-III

7. What is user define data type in C++? Explain the various user define data type in C++. 2+10
OR
What are the basic concepts of OOPs language? Explain each. 12
8. Explain the various types of jumping statements in C++ with example. 12
OR
Write a C++ program read n values into array find sum and average using pointer with function. 12
9. How to define member functions of a class? Explain with example. 12
OR
What is friend function? What are the general characteristic of friend function? Write a C++ program calculate factorial value using friend function. 3+4+5
10. Write a C++ program to demonstrate multiple inheritance, assume suitable data or (data member) for defining classes. 12
OR
What is operator overloading? Explain with suitable example. 4+8
11. Explain the various file stream classes used in C++. 12
OR
What is exception? How many types of exception? How to handle exception in C++? Explain. 2+2+8

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DISCRETE MATHEMATICS

Time Allowed : Three Hours

Maximum Marks : 100

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Write your roll number on question paper before start writing answers of questions.

PART - I: (Very short answer) consists of 10 questions of 2 marks each. Maximum limit for each question is upto 40 words.

PART - II: (Short answer) consists of 5 questions of 4 marks each. Maximum limit for each question is upto 80 words.

PART - III: (Long answer) consists of 5 questions of 12 marks each with internal choice.

PART - I

Attempt all parts of the question.

1. (a) Let $a = b \pmod{x}$ and y be any integer then show that $a - y = b - y \pmod{x}$.
- (b) Expand $(1+x)^5$ using Binomial theorem.
- (c) If $A \subseteq B$ then show that $A \oplus B = B - A$.
- (d) Define equivalence relation.
- (e) Prove that $\sim (p \vee q) \Leftrightarrow \sim p \wedge \sim q$.
- (f) Let $\langle B, +, \cdot, ', 0, 1 \rangle$ be a Boolean algebra, then for all $a \in B$, prove that $a + a = a$.
- (g) Define simple graph.
- (h) Define product of two graphs.
- (i) Define Tree.
- (j) Define Spanning Tree.

PART - II

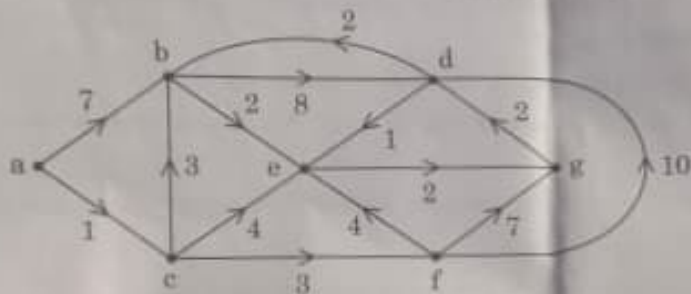
Attempt all the parts of the question.

2. (a) Solve $a_r = a_{r-1} + a_{r-2}$; $r \geq 2$, $a_0 = 0$, $a_1 = 1$.
- (b) If A , B , C and D are any four sets, then prove that $(A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)$.
- (c) If p and q are two statements then show that $p \leftrightarrow q$ and $(p \wedge q) \vee (\sim p \wedge \sim q)$ are logically equivalent.
- (d) Prove that the numbers of edges in a simple graph with n vertices and k connected components ($k \geq 1$) cannot exceed $\frac{(n-k)(n-k+1)}{2}$.
- (e) Prove that there is one and only path between every pair of distinct vertices in a tree.

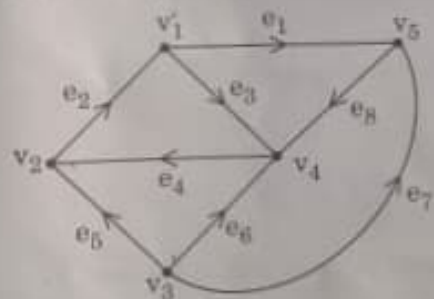
PART - III

Attempt all questions by taking any two parts from each question.

3. (a) Prove that $6^{n+2} + 7^{2n+1}$ is divisible by 43 for each positive integer n .
- (b) Find the Co-efficient x^r for the generating function $G(x) = \sum_{r=0}^{\infty} a_r x^r = \frac{x^2 - 5x + 3}{x^4 - 5x^2 + 4}$.
- (c) Solve the recurrence relation $a_r - 6a_{r-1} + 9a_{r-2} = r \cdot 3^r$.
4. (a) How many integers are there between 1 and 1000 which are not divisible by 2, 3, 5 or 7?
- (b) Is the relation $R_1 = \{(a, b) | ab + 1 > 0; a, b \in \mathbb{R}\}$ on the set \mathbb{R} of real numbers, equivalence relation? If not, explain.
- (c) Prove that the inverse of a one-one onto function is one-one onto.
5. (a) Prove by means of truth table, that $p \rightarrow (q \wedge r) \Leftrightarrow (p \rightarrow q) \wedge (p \rightarrow r)$
- (b) In the Boolean algebra $\langle B, +, \cdot, ', 0, 1 \rangle$, $\forall a \in B$, prove that $(a')' = a$.
- (c) Prove that, no Boolean Algebra can have exactly three distinct elements.
6. (a) Find the shortest path between the vertices a and g in the following directed weighted graph.



- (b) If G is simple connected planer graph with n vertices and e edges ($e > 2$), then $e < 3n - 6$.
- (c) Find the adjacency matrix and the incidence matrix of the following directed graph.



7. (a) If T is binary tree with n vertices and of height h , then prove that $h + 1 \leq n \leq 2^{h+1} - 1$.
- (b) Prove that a graph G is connected if and only if it has a spanning tree.
- (c) Discuss Kruskal's algorithm to find a minimal spanning tree for a weighted connected graph.

B.C.A. (Part - II) EXAMINATION, 2021

(Faculty of Science)

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DATABASE MANAGEMENT SYSTEM

Time Allowed : Three Hours

Maximum Marks : 100

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PART - B : (Short answer) consists of **5** questions of **four** marks each. Maximum limit for each question is upto **80** words.

PART - C : (Long answer) consists of **5** questions of **twelve** marks each with an internal choice.

PART - A

10x2=20

1. (a) Define database.
- (b) What is mean by data independence ?
- (c) Define attributes and entities.
- (d) What is mean by aggregation ?
- (e) What is mean by data recovery ?
- (f) Define transactions.
- (g) What is SQL ?
- (h) Define views.
- (i) Define distributed database.
- (j) What is mean by object database ?

PART - B

2. (a) Discuss the Database system v/s File system.
- (b) Discuss the various types of keys.
- (c) Explain Boyce Codd Normal Form with examples.
- (d) Discuss the Aggregate functions with examples.
- (e) What is mean by concurrency control ? Discuss the concurrency control in distributed databases.

5x4=20

PART - C

3. (a) Discuss the architecture of DBMS.
 - (b) Discuss the role of database administrator.
- OR
- (a) Explain the advantages and disadvantages of DBMS.
 - (b) What is mean by data independence ?

6-

10

4. (a) Discuss the fundamental operations of relational algebra.
(b) Discuss the generalization and aggregation.

OR

Write short notes on :

- (a) Mapping constraints
(b) E-R Model

5. Discuss the functional dependencies, access control, backup, recovery and maintenance.

OR

Discuss the various Normal Forms with examples.

6. (a) Explain SQL Data types.
(b) Discuss the insert, update and delete operations with examples.

OR

Write short notes on :

- (a) Characteristics of SQL
(b) Types of SQL commands
(c) Join, Union and Intersection in SQL

7. (a) Explain object oriented databases.
(b) Discuss Distributed Query Processing.

OR

Write short notes on :

- (a) Object Oriented data model
(b) Object Relational databases
(c) Distributed Transactions

WEB DESIGNING AND MULTIMEDIA

Time Allowed : Three Hours

Maximum Marks : 100

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PART - I

1. Answer all these following questions. Each question carries **equal** marks.

2x10=20

- (a) What is Web Page ?
- (b) What is the role of Web Browser ?
- (c) Differentiate between HTML elements and Tags.
- (d) What is the role of FORM in HTML ?
- (e) How can you refer to CSS file in Web Page ?
- (f) Explain IFrame.
- (g) What do you mean by JQuery ?
- (h) What is AJAX ?
- (i) How filling a selection with color in Photoshop ?
- (j) Listout any 2 important tools of Coraldraw.

PART - II

2. Attempt all questions. Each question carries **equal** marks.

4x5=

- (a) What is the use of Plug-Ins in Web ?
- (b) How to link an image, a website url and e-mail address within a web page ? Explain.
- (c) Explain the elements of Stylesheets.
- (d) Explain how JavaScript working with variables and data functions.
- (e) Differentiate between vector image and raster image.

PART - III

3. (a) Explain Web security and Privacy issues in detail.
(b) Explain playing streaming Audio and Video.

OR

Write short notes :

- (a) Search Engine
(b) News and Chat
(c) Use of Web Resources in Health and Medicine

4. Explain the following with suitable example.

- (a) Table
(b) DIV
(c) Layer in CSS

OR

Explain elements of Web Page. Write steps of creating a Web site.

5. (a) Write features of DHTML.
(b) Explain importance of CSS in HTML with suitable example.

OR

- (a) Explain types of Stylesheets with example.
(b) What is Filter effects in CSS?

6. Explain the JavaScript object model in detail.

OR

- (a) What do you mean by client side JavaScript validation? Explain in detail.
(b) Explain advantage of JQuery with example.

7. (a) Differentiate among JPEG, PNG, GIF and TIFF image file format in detail.
(b) Explain magic wand tool in detail in Photoshop.

OR

- (a) Explain uses and importance of Coraldraw in designing.
(b) Explain basic tools for shapes in Coraldraw.

This question paper contains 2 printed pages

B.C.A. (P. - II)

7

5

3x4=12

3x4=12

12

5

7

7

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12

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5

6

6

B.C.A. (Part - II) EXAMINATION, 2021

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

Business Accounting

Maximum Marks : 100

Time Allowed : Three Hours

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PART - I

10x2=20

1. (a) Give name of any two accounting concept.
- (b) Classify different types of Accounts.
- (c) Explain any two objectives of Preparing a Trial Balance.
- (d) Write two causes of Depreciation.
- (e) Give any two name of Provision.
- (f) Explain the kinds of Error's.
- (g) Give any two names for indirect expenses.
- (h) Give two examples of adjustment.
- (i) Give the formula of amount of claim.
- (j) Explain any two examples of Financial Expenses.

PART - II

5x4=20

2. (a) Give 4 persons who might feel interested in accounting.
- (b) Explain sub-division of Journal.
- (c) Give any four distinction between Reserve and Provision.
- (d) Received ₹ 500 from Dilip, but the same was wrongly credited to Ankit. Give Journal entries to rectify them.
- (e) Give four names for Fixed Assets.

P.T.O.

3. Explain the various Accounting concepts and conventions.

OR

12

Differentiate between Book-keeping and Accounting.

12

4. What are the different types of cash books? Explain in detail.

OR

12

Give Journal Entries in the books of Nishchag for the following transactions.

2021

₹

1. Goods purchased from Sumit	40,000
2. Goods sold to Kumbhat	20,000
3. Loan received from Bank	2,22,000
4. Rent Paid to Suresh	7,500
5. Goods returned to Sumit	5,000
6. Goods returned by Kumbhat	3,000
7. Goods given in charity ₹ 400 and Cash	600
8. Paid to Sumit in full settlement	34,500
9. Received from Kumbhat at full settlement	16,000
10. Paid for Stationery	5,000
11. Paid for salary	15,000
12. Rent Received	1,500

5. Prepare a Trial Balance from the following balances of Ledger Accounts :

12

Capital A/c	1,00,000 Cr
Building A/c	15,000
Furniture A/c	7,500
Motor Car A/c	25,000
Opening stock A/c	40,000
Office Exps. A/c	15,000
Carriage Inward A/c	3,000
Cash at Bank A/c	20,600
Drawings A/c	18,000
Loan From Hari A/c	15,000 Cr
Sales A/c	1,00,000 Cr
Bad Debts A/c	450
Purchase A/c	75,000
Commission Received A/c	9,500 Cr
Debtors A/c	60,000
Creditor's A/c	55,050 Cr

OR

What are the various methods of providing depreciation?

12

6. From the following particulars prepare the Trading Account for the year ending 31st March, 2021 :

12

Opening Stock	24,500
Cash Purchase	86,300
Credit Purchase	2,74,650
Purchase Returns	13,400
Sales	6,27,480
Sales Returns	18,900
Productive Wages	63,500
Carriage Inward	8,600
Motive Power	5,750
Import Duty	43,250
Other MFG Expenses	9,300
Closing stock was valued at	₹ 32,200

OR

Prepare a Balance sheet in the order of Permanence by taking imaginary figures.

12

7. Name the main adjustments and give adjustment journal entries with examples.

12

OR

Write short notes on :

4+4+4=12

- Gross Profit Ratio
- Average claim
- Indemnity Period