

Answer ALL questions.

15. Evaluate $\int \frac{1}{e^x + e^{-x}} dx$.

16. Test the convergence of $\sum_{n=1}^{\infty} \frac{1}{\sqrt[n]{n}}$.

17. The slope of the curve $y = x^3 - 3x^2 - 2x + 7$ at (1,3).

18. Find the order and degree of $\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^3 = 5y$.

19. If $u = xe^y + ye^x$ then find $\frac{\partial u}{\partial y}$.

B.C.A. DEGREE EXAMINATION, MARCH 2012.

(Regular)

(Examination at the end of Second Year)

Part II — MATHEMATICS – II

Time : Three hours

Maximum : 100 marks

PART I — (90 marks)

SECTION A — ($3 \times 20 = 60$ marks)

Answer any THREE of the following.

1. (a) Test the convergence of the series $\sum_{n=1}^{\infty} \sqrt{n^4 + 1} - \sqrt{n^4 - 1}$.

(b) Test the convergence of the series $\sum_{n=1}^{\infty} \frac{2^n}{n^3}$.

2. (a) Solve $y - x \frac{dy}{dx} = a \left(y^2 + \frac{dy}{dx} \right)$.

(b) Solve $(x^2 - y^2) dx + 2xy dy = 0$.

3. (a) If $u^2 = \frac{1}{x^2 + y^2 + z^2}$ then show that

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0.$$

(b) If $u = \tan^{-1} \left(\frac{x^2 + y^2}{x - y} \right)$ then show that

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{2} \sin 2u.$$

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

(b) Solve $x(x-1) \frac{dy}{dx} - y = x^2(x-1)^2$.

5. (a) If the gradient of the tangent at the point (1,1) to the curve $xy + ax + by = 0$ is 2 then find the values of a, b.

(b) Find the equation of tangent and normal to the curve $2x^2 - xy + 3y^2 = 18$ at (3,1).

6. (a) Evaluate $\int \frac{2 \cos x + 3 \sin x}{4 \cos x + 5 \sin x} dx$.

(b) Evaluate $\int_0^{\pi} \frac{x}{1 + \sin x} dx$.

SECTION B — (5 × 6 = 30 marks)

Answer any FIVE questions.

7. Solve $e^x \cot y dx + (1 - e^x) \csc y dy = 0$.

8. Solve $xdy - ydx = xy^2 dx$.

9. Find $\int \frac{\cos^2 x dx}{1 - \sin x}$.

10. Evaluate $\int_0^{\pi/2} \cos^{11} x dx$.

11. Test the convergence of $\sum_{n=1}^{\infty} \frac{2n-1}{n(n+1)(n+2)}$.

12. Fit a straight line to the following data.

x	=	0	1	2	3	4
y	=	1	1.8	3.3	4.5	6.3

13. Show that $\lim_{x \rightarrow 0} \frac{1 - \cos mx}{\cos nx} = \frac{m^2}{n^2}$.

14. Find the point on the parabola $y^2 = 8x$ for which the abscissa and ordinate changes at the same rate.

B.C.A. (Regular) DEGREE EXAMINATION, MARCH 2012.

(Examination at the end of Second Year)

Part II — ACCOUNTING AND FINANCIAL MANAGEMENT

Time : Three hours

Maximum : 100 marks

PART A — (3 × 20 = 60 marks)

Answer any THREE out of Five questions.

1. Explain the main objectives and functions of accounting.
2. What do you understand by 'Subsidiary books? Explain the purpose of each of them.
3. What is financial analysis? Discuss about the tools of financial analysis.
4. The following is the Trial Balance of Ram Lal on March 31, 2007.

Debit Balances :	Rs.	Credit Balances :	Rs.
Bank	7,500	Bills receivable	7,500
Purchases (adjusted)	34,96,000	Stock (31 st March, 2007)	3,06,250
Salaries	21,000	Credit Balances :	
Carriage on Sales	2,500	Capital	2,00,000
Carriage on purchases	2,000	Bills Payable	50,000
Lighting	1,500	Loan	1,00,000
Buildings	1,35,000	Sales	36,00,000
Rates and Taxes	2,000	Discount	2,000
Sundry Debtors	40,000	Commission	500
Furniture	30,000	Sundry Creditors	1,00,000
Cash in Hand	1,250		

Rates have been prepaid to the extent of Rs. 600. During the year, bad debt amounted to Rs. 2,500. A provision @ 5% has to be made on debtors. Buildings have to be depreciated at 2% and Furniture at 10%. Prepare Trading and Profit & Loss A/c and Balance Sheet as on March 31, 2007.

5. Enter the following transactions in a two column Cash Book and post it into the ledger.

2007	Rs.
Dec. 1 Commenced business with Cash	50,000
2 Bought goods for cash	28,000
5 Received cash from Arun	2,000
7 Paid cash to Sanjay	2,900
Discount allowed by him	100

2007	Rs.
Dec. 10 Paid wages	3,000
14 Received from Rajesh cash	950
Allowed him discount	50
16 Paid into bank	10,000
18 Cash sales	2,500
20 Purchased stationery for cash	250
23 Paid Suresh cash	3,900
Discount allowed	100
26 Received from Rajesh	1,900
Allowed him discount	100
30 Paid salaries	2,000

PART B — (5 × 6 = 30 marks)

Answer any FIVE questions.

6. Define a Bank Reconciliation Statement. How is it prepared / Submit a proforma example of the same.
7. Discuss the purposes of cash flow analysis.
8. Write any 5 Ratios.
9. Write the Impact of working capital in the Business.
10. Write Internal rate of return.
11. Write about financial reports.

PART C — (5 × 2 = 10 marks)

Answer ALL questions.

12. Journal.
13. Quick ratio.
14. B.R.S.
15. Trade Discount.
16. Subsidiary books.

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B.C.A. DEGREE EXAMINATION, MARCH 2012.

(Regular)

(Examination at the end of Second Year)

Part II — DATA STRUCTURES AND OBJECT
ORIENTED PROGRAMMING

Time : Three hours

Maximum : 100 marks

SECTION A — ($10 \times 2 = 20$ marks)

1. Answer the following questions.
 - (a) Differentiate between Stack and Queue.
 - (b) Define Recursion. Give an example.
 - (c) Explain about Infix, prefix and postfix notations.
 - (d) Define Graph. Specify its representations.
 - (e) Differentiate between Procedure-oriented and Object-oriented programming.
 - (f) Specify any four String handling functions.
 - (g) Explain about 'this' pointer.
 - (h) Define Inheritance. Specify the types of Inheritance.

- (i) Write a C++ Programme for implementing Copy constructor.
- (j) Write the steps for developing programs for Microsoft windows in C++.

SECTION B — (4 × 20 = 80 marks)

Answer the following Questions.

2. (a) Define Tree. Write the algorithm for tree traversals. Give examples.
- (b) Write a C++ Programme for implementing tree traversals.

Or

- (c) Write the algorithms for BFS and DFS. Give examples.
- (d) Write a C++ Programme for DFS and BFS.

3. (a) Write the algorithm for operations on Single linked list.
- (b) Write the C++ Programme for Bubble sort.

Or

- (c) Write the algorithm for operations on Double linked list.
- (d) Write the C++ Programme for Linear search.

4. (a) Differentiate between C and C++.
- (b) Explain about using C libraries in C++ Programme. Give examples.

Or

- (c) Explain the Data types and Operators in C++.

5. (a) Define Class and Object. Write a C++ program implementing predefined classes in C++.
- (b) Explain about Building class libraries in C++.

Or

- (c) Define Operator Overloading. Write C++ Programs for Unary operator overloading using Friend function and Member function.
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B.C.A. DEGREE EXAMINATION,
MARCH 2012.

(Regular)

(Examination at the end of Second Year)

Part II – DATABASE MANAGEMENT SYSTEMS

Time : Three hours

Maximum : 100 marks

SECTION A – ($10 \times 2 = 20$ marks)

1. Answer the following questions:

- (a) Differentiate between Data and Information.
- (b) Specify the need for Normalisation.
- (c) Specify the data base design strategies.
- (d) Explain about Network model.
- (e) Specify types of Relationships.
- (f) Write any two DDL commands.
- (g) Specify the syntax for Ordering a listing.
- (h) Write about Operators used in Oracle.
- (i) Define View. Write Syntax for creating a View.
- (j) Write the steps for Building a Report in SQL Plus.

SECTION B – (4 × 20 = 80 marks)

Answer the following questions

2. (a) Explain about data base systems.

Or

- (b) Explain about Entity Relationship Modeling. Give an example.

3. (a) Explain the different types of Keys. Give examples.
(b) Discuss various types of Dependencies. Give examples.

Or

- (c) Explain the System development Life cycle.
(d) Differentiate between Centralized vs Decentralized design.

4. (a) Explain Relational Set Operators. Give examples.
(b) Explain the SQL Join operators. Give examples.

Or

- (c) Write about SQL functions. Give examples.

5. (a) Explain about Sub Queries and Correlated Queries. Give examples.

Or

- (b) Explain the DML commands.