D 1523　　　　　　　Q.P. Code : [07 DSCA 07]

(For the candidates admitted from 2007 onwards)

B.C.A. DEGREE EXAMINATION, DECEMBER 2019.

Second Year

Part III — Computer Applications

OPERATING SYSTEMS

Time : Three hours　　　　　　　Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1.　(a)　What are the important objectives of Operating System Design? Explain.　(6)

　　(b)　How is the execution content of a Process used by the Operating System?　(6)

　　(c)　Discuss in detail about Storage Management responsibilities of a typical Operating System.　(8)

2.　(a)　Describe the different services of Operating System with suitable illustrations.　(10)

　　(b)　Explain the following :

　　　　(i)　Booting Process　(5)

　　　　(ii)　Device Driver　(5)

3. (a) Discuss in detail about evolution of Multiprogramming. (10)

(b) Explain briefly about various process states and discuss with a state diagram. (10)

4. (a) Summarize about the virtual memory management systems. (10)

(b) Explain about fixed partition memory management. (10)

5. (a) Discuss briefly about distributed message passing with neat diagram. (10)

(b) Explain the concept of windows cluster server with suitable illustration. (10)

6. (a) Describe client/server computing with suitable illustration. (10)

(b) Elucidate the operations that can be made on a process. (10)

7. (a) What is kernel? Discuss briefly the approaches of designing operating systems. (10)

(b) Describe about traditional UNIX system with suitable illustration. (10)

8. (a) Describe about non-contiguous allocation of memory management system with example. (10)

(b) Explain briefly about the four classes of Client/Server Applications with suitable examples. (10)

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D 1526   **Q.P. Code : [07 DSCA 10]**

B.C.A. DEGREE EXAMINATION, DECEMBER 2019.

Third Year

Part III — Computer Applications

DATABASE CONCEPTS AND VISUAL
PROGRAMMING

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Discuss about the difference between DBMS,
         RDBMS and File Systems.
                                                    (8)

    (b) Justify the need for normalization. Explain
         1NF, 2NF, 3NF and BCF with appropriate
         records.
                                                    (12)

2. (a) What is atomicity? How it is used to
         database management system?
                                                    (8)

    (b) Discuss the relationship between the
         primary key of a relation and the functional
         dependencies among all attributes within
         that relation.
                                                    (12)

3. (a) How do you design a user interface in Visual Basic? Explain. (10)

   (b) Discuss about while loop and do...while loop with suitable example. (10)

4. (a) Write a visual basic program to sort the names of the students in ascending order. (10)

   (b) With example, explain the different types of operators available in visual basic. (10)

5. (a) Compare and contrast ActiveX controls and ordinary window controls. (10)

   (b) Explain the relationship between option button, check box and frame with suitable example. (10)

6. (a) Discuss about the steps in creating the popup menu with neat diagram. (8)

   (b) Give elaborate discussion on file system controls in Visual Basic. (12)

7. (a) Write about the usage of option explicit and on error next statements with example. (10)

   (b) With example code, explain the areas in which for...each...next code is used (10)

8. (a) What is the need for control arrays? Write a Visual Basic program to simulate a simple calculator using control arrays. (10)

   (b) Discuss about different modes of accessing the data from and to the data file with example. (10)

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$\mathcal{BCA}$

1. (a) Find the root of the equation $x^3 + x^2 - 1 = 0$ by bisection method.

   (b) Using Regula Falsi method find a root of $x\,e^x = 3$.

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8. (a) Obtain the lines of regression and find the coefficient of correlation from the following data.

x:	92	89	87	86	83	77	71	63	53	50
y:	86	83	91	77	68	85	52	82	37	57

   (b) Find the coefficient of rank correlation for the data given below.

x:	40	65	61	49	52	42	68	57	58	46
y:	51	58	67	55	76	45	69	56	73	63

2. (a) Find the positive root of $2x^3 - 3x - 6$ by Newton-Raphson method.

(b) Solve the following system by Gauss elimination method $x_1 - x_2 + x_3 = 1$; $3x_1 - 2x_2 + 3x_3 = 6$; $2x_1 - 5x_2 + 4x_3 = 5$.

3. (a) Using Gauss-Jordon method solve

$2x + y + z = 10$; $3x + 2y + 3z = 18$;

$x + 4y + 9z = 16$.

(b) Solve the system of equation $4x + 2y + z = 14$, $x + 5y - z = 10$, $x + y + 8z = 20$ using Gauss – seidel method.

4. (a) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$ at $x = 1.1$, from the given data.

x:	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y:	7.989	8.403	8.781	9.129	9.451	9.750	10.031

(b) Evaluate $\displaystyle\int_0^{\pi} \sin x \, dx$, by using Simpson's $-\dfrac{1}{3}$ rule dividing the range into 10 equal parts.

5. (a) Find $y(62)$ from the following data.

x:	45	50	55	60	65
y:	114.84	96.16	83.32	74.48	68.48

(b) Find the value of $y(10)$ from the following data.

x:	5	6	9	11
y:	12	13	14	16

6. (a) Using Taylor series method, compute the value of $y(0.2)$ from $\dfrac{dy}{dx} = 1 - 2xy$, $y(0) = 0$.

(b) By applying the fourth order Runge-Kutta method find $y(0.2)$ from $y' = y - x$, $y(0) = 2$.

7. (a) Obtain the mean, median and mode of the following.

Class:	10-25	25-40	40-55	55-70	70-85	85-100
f:	6	20	44	26	3	1

(b) The scores of two players A and B are given. Who is the better player and who is the more consistent player?

A: 74 75 78 72 78 77 79

B: 87 84 80 88 89 85 86

D 1520

Q.P. Code : [07 DSCA 04]

(For the candidates admitted from 2007 onwards)

B.C.A. DEGREE EXAMINATION, DECEMBER 2019.

Second Year

Part III — Computer Applications

PROGRAMMING WITH C AND C++

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) List and explain the basic data types available in C.

(5)

(b) Explain the use of do-while statement with an example.

(5)

(c) Explain in detail about different types of Operators with suitable examples.

(10)

2. (a) Define Array. Explain its salient features. (5)

(b) Discuss briefly about the importance of Pointers.

(5)

(c) What do you mean by Structure? How it is declared? Explain with examples.

(10)

3. (a) What do you mean by Inline Functions? Explain with an example. (6)

(b) What is a class? How does it accomplish data hiding? Explain briefly. (6)

(c) Write a C++ program to illustrate the concept of switch statement. (8)

4. (a) What is Operator Overloading? Why it is necessary to overload an operator? Explain briefly. (10)

(b) Explain the rules that need to be kept in mind in deciding Virtual Functions. (10)

5. (a) What is a file? What are the steps involved in manipulating a file in a C++ program? (10)

(b) Describe the importance of Exception Handling with suitable illustrations. (10)

6. (a) Write a C program to find second largest and second smallest element in an array. (10)

(b) Define Function. Explain briefly about call by value and call by reference with examples. (10)

7. (a) Describe the concept of Function Overloading with suitable examples. (10)

(b) Write a C++ program to illustrate Class declaration, definition and accessing Class members. (10)

8. (a) Describe the various forms of Inheritance with suitable examples. (10)

(b) Write a C++ program to illustrate the concept of this pointer. (10)

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D 1518

Q.P. Code : [07 DSC 01/
07 DSCA 02/07 DIT 02]

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

$(5 \times 20 = 100)$

1. (a) Convert $(A34B)_{16}$ to ( )$_8$. (4)

    (b) Convert $(101101)_2$ to ( ) Gray. (4)

    (c) Convert $(345)_{10}$ to ( ) BCD. (4)

    (d) Write +95 and –95 in signed magnitude
         form. (4)

    (e) Convert $(735)_8$ to ( )$_2$. (4)

2. (a) Explain full subtractor with circuit diagram.
         (10)

    (b) Draw the circuit diagram and TT of NOR,
         NAND gates. (5 + 5)

3. (a) Simplify using K-map

         $Y = F(A, B, C) = \sum (1, 3, 4, 5, 6, 7)$. (10)

    (b) Convert the logical function of three
         variables $F(A, B, C) = A + BC$ to standard
         SoP expression, (ie) sum of min terms. (10)

4. Explain the instruction set and addressing modes
    of 8085 microprocessor. (20)

5. What is an interrupt? Explain priority interrupts
    in detail. (20)

6. Explain CPU-IOP communication. (20)

7. (a) Write short notes on :

         (i)   Logical address and physical address.

         (ii) Page map table

         (iii) Cache memory. (4 + 4 + 4)

    (b) Explain the memory hierarchy in detail. (8)

8. Explain RAM and ROM chips with diagram. (20)

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Reg. No. : _____

D 1517

Q.P. Code : [07 DSCA 01]

(For the candidates admitted from 2007 onwards)

B.Sc. / B.C.A. DEGREE EXAMINATION,
DECEMBER 2019.

First year

Part III — Computer Applications

COBOL PROGRAMMING

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100 marks)

1. (a) Write about WORKING STORAGE
         SECTION and FILE SECTION.   (10)

    (b) Describe the structures of the PROCEDURE
         DIVISION, MOVE and Arithmetic VERBS.   (10)

2. (a) Write a COBOL program to add the first 20
         natural numbers using PERFORM
         Statement.   (10)

    (b) Discuss the various options of OCCURS
         clause and MERGE verb in detail.   (10)

3. Illustrate with an example of processing
    multidimensional tables.   (20)

4. Explain the DIVIDE verb in all possible options in
    COBOL, with an example.   (20)

5. Explain the following terms:

    (a) Condition names   (10)

    (b) Move corresponding statements.   (10)

6. Explain the GO TO... DEPENDING ON
    STATEMENT with suitable examples.   (20)

7. (a) Write the syntax and uses for SORT verb
         with suitable example.   (10)

    (b) Discuss the REDEFINES and RENAMES
         clause in COBOL.   (10)

8. (a) Discuss the concept of indexed sequential
         files.   (10)

    (b) Discuss the statements for sequential files in
         COBOL.   (10)

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Reg. No. : ....

D 1521   Q.P. Code : [07 DSCA 05]

(For the candidates admitted from 2007 onwards)

B.C.A. DEGREE EXAMINATION, DECEMBER 2019.

Second Year

Part III — Computer Applications

DATA STRUCTURES AND ALGORITHMS

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. How is the address of an element calculated in a two dimensional array? Explain polynomial addition operation using array.   (20)

2. (a) Explain how queues can be implemented using Arrays.   (10)

    (b) How does a queue work? Explain the algorithm for inserting and deleting from a queue.   (10)

3. What is a Stack? Explain its operations with example. Convert the following Infix Expression to postfix using stack. A*B − (C + D) + E.   (20)

4. (a) Write the algorithm to count the number of nodes in a single linked list.   (8)

    (b) Write an algorithm to perform the following operation on a singly linked list.   (12)

        (i) Insert new node at the beginning of list.

        (ii) Insert new node at Middle.

        (iii) Delete a nod in the middle and last.

        (iv) Count the number of nodes.

5. Write an algorithm to insert an item into a binary search tree and trace the algorithm with the items 6, 2, 8, 1, 4, 3, 5.   (20)

6. Explain the Merge sort application using Divide and Conquer technique.   (20)

7. Explain Heap sort with example.

5, 2, 12, 13, 4, 9, 15, 25, 3.   (20)

8. Explain Quick Sort Algorithm in detail. Sort the following numbers using Quick sort procedure :

    42, 12, −8, 98, 67, 83, 104, 07.   (20)

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D 1522   Q.P. Code : [07 DSCA 06/07 DSC 06]

(For the candidates admitted from 2007 onwards)

B.Sc./B.C.A. DEGREE EXAMINATION,
DECEMBER 2019.

Second Year

Part III — Computer Science/Computer Applications

SOFTWARE ENGINEERING

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. Describe the important factors that influence quality and productivity with suitable examples.
    (20)

2. How will you estimate the Software Maintenance Costs? Justify your answer.
    (20)

3. (a) Define Abstraction. Explain its types.   (5)

    (b) What are the different types of Cohesion? Discuss.   (5)

    (c) Discuss in detail about the State Oriented Notations with neat sketch.   (10)

4. Describe about Structured Coding Techniques with suitable illustrations.
    (20)

5. Explain briefly about Unit Testing and System Testing.
    (20)

6. (a) What are the major factors that influence Software Cost? Discuss with an example.   (10)

    (b) Explain the main objectives of Planning Organizational Structure.   (10)

7. (a) Explain the concept of Recursion.   (5)

    (b) Discuss the important guidelines of Documentation.   (5)

    (c) Describe about Coding Style with suitable illustrations.   (10)

8. (a) Explain the important guidelines for Testing a Software Product.   (7)

    (b) What are the development activities that enhance Software Maintainability? Discuss.   (7)

    (c) Write short note on Walkthrough Inspections.   (6)

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D 1525   Q.P. Code : [07 DSCA 09]

(For the candidates admitted from 2007 onwards)

B.C.A. DEGREE EXAMINATION, DECEMBER 2019.

Third Year

Part III — Computer Applications

JAVA PROGRAMMING

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. Describe the basic concepts of Object Oriented Programming with suitable examples.   (20)

2. (a) What is a class? How does it accomplish data hiding?   (5)

   (b) Define Constructor. How do we invoke a Constructor? Explain.   (5)

   (c) Describe the different levels of Access Protection available in Java.   (10)

3. (a) What is Vector? How it is different from an array? Explain briefly.   (10)

   (b) How do we set priorities for Threads? Discuss with sample program.   (10)

4. (a) Explain how exception handling mechanism can be used for debugging a program.   (10)

   (b) What are the different stages in the life cycle of an Applet? Distinguish between init ( ) and start ( ) methods.   (10)

5. (a) What is a File? Why do we require files to store data? Explain with an example.   (10)

   (b) Describe the major tasks of I/P and O/P Stream Classes.   (10)

6. (a) What are Symbolic Constants? How they are useful in developing program?   (10)

   (b) In what says does a Switch statement differ from if statement? Justify your answer.   (10)

7. Discuss in detail about various forms of implementing interfaces with suitable examples.   (20)

8. Can Java directly support Multiple Inheritance? Illustrate your answer with an example Java program.   (20)

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Reg. No. : ....

D 1527   Q.P. Code : [07 DSCA 11]

(For the candidates admitted from 2007 onwards)

B.Sc./B.C.A. DEGREE EXAMINATION,
DECEMBER 2019.

Third Year

Part III — Computer Applications

E-COMMERCE

Time : Three hours   Maximum : 100 marks

Answer any FIVE questions.

(5 × 20 = 100)

1. Discuss the E-Commerce architecture and its components with a block diagram.   (20)

2. Explain the different business models of E-Commerce with respect to customers and vendors.   (20)

3. (a) Explain how E-Commerce facilitates customization of products and services.   (10)

    (b) Discuss the benefits and limitations of E-Commerce.   (10)

4. Explain how Supply Chain Management can be used to renovate the businesses using E-Commerce.   (20)

5. Explain the security measures to be considered for any B2B E-Commerce system.   (20)

6. Write about the security service that is to be offered in E-payment systems. Discuss any one E-payment system in detail.   (20)

7. (a) What is an EDI? List its benefits and limitations.   (10)

    (b) What is the difference between E-Commerce and Mobile Commerce?   (10)

8. What type of electronic payment systems is required in E-Commerce? What are the different types of payment systems? Explain the necessary characteristics of each type of payment system and give an example of each where it is used.   (20)

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