



Reg. No. : .....

Name : .....



K19U 2506

III Semester B.C.A Degree (CBCSS-Reg./Sup./Imp.)

Examination, November - 2019

(2014 Admn. Onwards)

GENERAL COURSE

3A12 BCA : DATA STRUCTURE

Time : 3 Hours

Max. Marks : 40

**Section - A**

1. One Word answer.

(8x $\frac{1}{2}$ =4)

- The notation \_\_\_\_\_ is the formal way to express the upper bound of an algorithm's running time.
- Merge Sort algorithm follows \_\_\_\_\_ programming approach.
- \_\_\_\_\_ is used to get the top data element of the stack, without removing it.
- \_\_\_\_\_ notation is known as Reversed Polish Notation.
- Binary search is a fast search algorithm with run-time complexity of \_\_\_\_\_
- \_\_\_\_\_ method remove (access) an item from the queue.
- In \_\_\_\_\_ last item contains link of the first element as next and the first element has a link to the last element as previous.
- \_\_\_\_\_ is a process to visit all the nodes of a tree.

**Section - B**

Write short notes on any **seven** of the following questions.

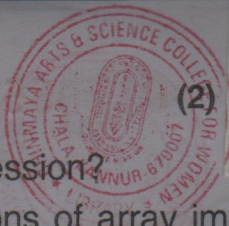
(7x2=14)

- Differentiate best and worst cases.
- Represent sparse matrix using array.
- What is the time complexity of merge sort?
- Explain the methodology of quick sort.

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6. What is postfix expression?
7. What are the limitations of array implementations?
8. Write algorithm to reverse a linked list.
9. What is complete binary tree?
10. Write algorithm for inorder traversal.
11. Explain addition of sparse matrices.

### Section - C

Answer any **four** of the following questions.

(4×3=12)

12. Explain Tower of Hanoi Problem.
13. Write the program for Binary Search.
14. Write an algorithm to search a node in linked list.
15. Explain the implementations of stack operations using Linked list.
16. Explain the linked representation of a Binary tree.
17. Convert  $((A+B)-C*(D/E))+F$  to postfix.

### Section - D

Write an essay on any **two** of the following questions.

(2×5=10)

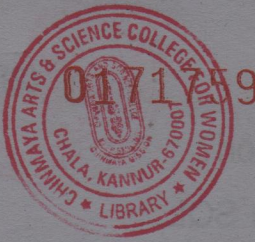
18. Write a program to convert a infix form to prefix form.
19. Short note on:
  - a) Priority Queue
  - b) Dequeue
  - c) Postfix Expression Evaluation:
20. Compare different sorting algorithms.
21. What is Binary Search Tree? Explain its operations.





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Examination, November - 2019  
(2014 Admn. Onwards)  
GENERAL COURSE  
3A13 BCA : DATABASE MANAGEMENT SYSTEM

Time : 3 Hours

Max. Marks : 40

SECTION - A

1. One Word answer. (8×0.5=4)
- a) In a relational schema, each tuple is divided into fields called .....
  - b) In an ER model, ..... is described in the database by storing its data.
  - c) An attribute of a table cannot hold multiple values is the property of .....
  - d) ..... is number of participating entities in a relationship.
  - e) In SQL, ..... command is used to add a column/integrity constraint to a table.
  - f) The ..... operation combines the results of two different queries which have the same set of attributes in the select clause.
  - g) The minimal set of super key is called .....
  - h) Relations produced from an E-R model will always be in .....

SECTION - B

Write short notes on any **seven** of the following questions. (7×2=14)

- 2. What is data model? What are the types of Data models?
- 3. What is transaction? State its properties.
- 4. What are the extended ER features?

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5. What is Normalization?
6. Write short note on SQL.
7. What are the data types available in sql?
8. What is Trigger?
9. List the set operations?
10. What is project operation?
11. What is Relational Calculus? State its types.

### SECTION - C

Answer any **Four** of the following questions.

(4×3=12)

12. Explain the functions of DBMS.
13. Explain the roles of DBA.
14. Compare BCNF and 3NF with examples.
15. Write query for creation of database and users.
16. Explain integrity constraints with example.
17. Explain domain calculus with example.

### SECTION - D

Write an essay on any **two** of the following questions.

(2×5=10)

18. What is E-R Model? Explain its components.
  19. Explain DML commands with examples.
  20. Write short notes on following:  
a) Join Operations    b) Views    c) Sequence
  21. What is Relational data model? Explain its important concepts.
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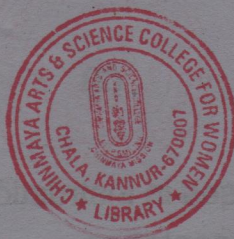


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K19U 2508

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Examination, November - 2019

(2014 Admn. Onwards)

CORE COURSE

3B06 BCA - COMPUTER ORGANIZATION

Time : 3 Hours

Max. Marks : 40

**SECTION - A**

Answer **ALL** questions.  $\frac{1}{2}$  mark each.

( $8 \times \frac{1}{2} = 4$ )

1. a) The register that holds an address for memory unit is called \_\_\_\_\_.
- b) Expand RISC.
- c) \_\_\_\_\_ register always points towards the top of stack.
- d) \_\_\_\_\_ field in the instruction format specifies the way the operand or the effective address is determined.
- e) SHRA instruction is used for \_\_\_\_\_
- f) \_\_\_\_\_ is used to supervise and synchronise all input and output transfers between CPU and peripheral.
- g) The third state of three state bus buffer is \_\_\_\_\_
- h) \_\_\_\_\_ memory directly communicates with CPU.

**SECTION - B**

Answer any **7** questions. Each question carries **2** Marks.

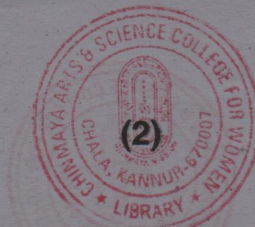
( $7 \times 2 = 14$ )

2. What are the different ways to represent a negative integer ?
3. What are microoperations?
4. Explain relative addressing mode.
5. What is the use of register transfer language ?
6. What are the address sequencing capabilities required in a control memory?

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7. What are the different phases in instruction cycle ?
8. Explain floating point representation.
9. What is control word ?
10. What are the different types of control characters in ASCII ?
11. What is the advantage of microprogrammed control ?

### SECTION - C

Answer any 4 questions. Each question carries 3 Marks. (4×3=12)

12. Draw the block diagram of a bus system for four registers.
13. Discuss the control functions and microoperations required for register-reference instructions.
14. Demonstrate the general configuration of a microprogrammed control unit.
15. Write the procedure to evaluate an expression using stack and RPN.
16. Explain any four dynamic arbitration algorithms.
17. Explain 2's complement addition and 2's complement subtractions.

### SECTION - D

Answer any 2 questions. Each question carries 5 Marks. (2×5=10)

18. Draw the block diagram and explain the functional units in a computer system.
19. What is mapping ? Explain the different types of mapping procedures in cache memory.
20. Explain direct memory access in detail.
21. Explain the different types of computer instructions.



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Examination, November - 2019  
(2014 Admn. Onwards)  
CORE COURSE  
3B07 BCA:INTRODUCTION TO MICROPROCESSORS

Time : 3 Hours

Max. Marks : 40

**Section-A**

1. One Word Answer (8×0.5=4)
- The number of address lines of 8085 is \_\_\_\_\_.
  - A 20-bit address bus can locate \_\_\_\_\_ locations.
  - NMI stands for \_\_\_\_\_.
  - The contents of accumulator before CMA instruction are A5H. Its content after instruction execution is \_\_\_\_\_.
  - AAM instruction is used for \_\_\_\_\_.
  - Status register is also called as \_\_\_\_\_.
  - In cascaded mode, the number of vectored interrupts provided by 8259A is \_\_\_\_\_.
  - All the functions of the ports of 8255 are achieved by programming the bits of an internal register called \_\_\_\_\_.

**Section-B**

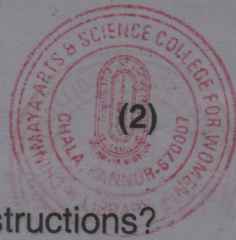
Write short notes on any **Seven** of the following questions. (7×2=14)

- What type of architecture is used in 8085.
- What is the difference between primary and secondary storage device?
- Explain how pipelined architecture is implemented in 8086.
- Explain the instructions related to interrupt subroutines.
- What is queue. How queue is implemented in 8086.

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7. What is SIM and RIM instructions?
8. What is the difference between DW and DD directives?
9. What is the difference between respective shift and rotate instruction?
10. What are the features of mode 0 operation in 8255.
11. What is Cycle Stealing?

### Section-C

Write short notes on any **Four** of the following questions. **(4×3=12)**

12. Explain the addressing modes of 8086.
13. Describe execution of a CALL instruction.
14. Explain four flag manipulation instructions in 8086.
15. Compare maskable and nonmaskable interrupts.
16. How does the DMA controller 8257 perform direct memory access?
17. What is handshaking port? Explain the working of this port.

### Section-D

Write short notes on any **two** of the following questions. **(2×5=10)**

18. Draw and explain the architecture of 8086.
19. Differentiate minimum mode and maximum mode of 8086 with diagram.
20. Explain the interrupt response sequence of 8086.
21. Explain Programmable Peripheral Interface with block diagram.





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III Semester B.Sc. Degree (CBCSS - Reg./Supple./Imp.) Examination,  
November - 2019

(2014 Admn. Onwards)

COMPLEMENTARY COURSE IN MATHEMATICS

3C03 MAT-BCA:MATHEMATICS FOR BCA-III

Time : 3 Hours

Max. Marks : 40

**SECTION-A**

All the first **Four** questions are compulsory. They carry **1** mark each. **(4×1=4)**

1. Find the general solution of  $y' = 2 \sec 2y$ .
2. Solve  $y'' + 2y' + 5y = 0$ .
3. The Laplace transform of the unit step function  $u(t-a)$  is \_\_\_\_\_.
4. Give the two dimensional Laplace equation.

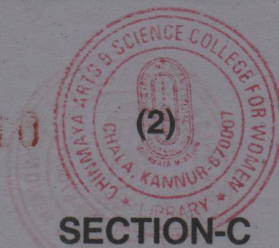
**SECTION-B**

Answer any **seven** questions from among the questions 5 to 13. These questions carry **2** marks each. **(7×2=14)**

5. Solve  $yy' + 4x = 0$ ,  $y(0)=3$ .
6. Test for exactness and solve  $(x-y) (dx-dy)=0$ .
7. Solve  $\frac{d^4 y}{dx^4} + 4y = 0$ .
8. Find the particular integral of  $(D^3+1)y = \sin(2x+3)$ .
9. Solve the IVP  $y'' + y' - 2y = 0$ ,  $y(0)=4$ ,  $y'(0) = -5$ .
10. Find the Laplace transform of  $e^{-3t}(\cos 4t+3\sin 4t)$ .
11. Find  $L^{-1}\left(\frac{1}{(s+1)^3}\right)$ .
12. Find the Fourier series to represent  $f(x)=x^2-2$  when  $-2 \leq x \leq 2$ .
13. Solve  $u_{xy} = u_x$  like an ODE.

P.T.O





## SECTION-C

Answer any **Four** questions from among the questions 14 to 19. These questions carry **3** marks each. (4×3=12)

14. Solve  $(1+y^2)dx=(\tan^{-1}y-x)dy$ .

15. Solve  $(xy^3+y)dx+2(x^2y^2+x+y^4)dy=0$ .

16. Solve  $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} - 3y = x^2 \log x$ .

17. Find  $L\left(\frac{1-\cos 2t}{t}\right)$ .

18. Find  $L^{-1}\left(\frac{s^2}{(s^2+4)^2}\right)$  using convolution theorem.

19. Obtain the Fourier series of  $f(x)=x^2$ ,  $-\pi < x < \pi$ . Hence show that

$$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi^2}{12}$$

## SECTION-D

Answer any **Two** questions from among the questions 20 to 23. These questions carry **5** marks each. (2×5=10)

20. Solve  $\frac{dy}{dx} + \frac{x}{1-x^2}y = x\sqrt{y}$ .

21. Solve  $\frac{d^2y}{dx^2} + 4y = 4 \tan 2x$ .

22. Solve  $y'' + 2y' + 5y = e^{-t} \sin t$ ,  $y(0)=0$ ,  $y'(0) = 1$  by Laplace transform..

23. Find the solution of wave equation  $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$  subject to the boundary conditions  $u(0,t)=0$ ,  $u(L,t)=0$  for all  $t \geq 0$  corresponding to the triangular initial

$$\text{deflection } f(x) = \begin{cases} \frac{2k}{L}x, & 0 < x < \frac{L}{2} \\ \frac{2k}{L}(L-x), & \frac{L}{2} < x < L \end{cases} \text{ and initial velocity zero.}$$