

BCA First Semester Examination, Dec. – 2019

FIRST PAPER

Fundamentals of Computer Science

Paper Code:- 42101

Time Allowed: Three Hours

Maximum Marks.70

(1) No supplementary answer book will be given to any candidate. Hence the candidates should write the answers precisely in the main answer book only.

(2) All the parts of one question should be answered at one place in the answer book.

(Attempt all six questions.)

Part I (Question No. 1 & 2) is compulsory & Part II (Question No. 3, 4, 5 & 6) has internal choice.

Part-I

1. Answer any 10 questions. Each question carries 1 mark.

10x1= 10

(Words limit up to 20 words each)

- a) What is RAM?
- b) What do you mean by Computer Networks?
- c) What is Software?
- d) Give names of any two storage devices.
- e) What is Virus?
- f) Explain non – impact printer?
- g) What is Bus Topology?
- h) Give names of any two search engines.
- i) What is the need of Operating System?
- j) What is Protocol?
- k) What is CPU?
- l) Define Algorithm.

2. Answer all the questions. Each question carries 5 marks.

4x5 = 20

(Words limit up to 50 words each)

- a) Explain different types of Operating System.
- b) Explain flowchart by giving its notations and example.
- c) Convert the following:
 - (i) $(11001)_2 = (?)_{10}$
 - (ii) $(42)_{10} = (?)_2$
- d) Explain classification of computers.

P.T.O.

Part-II

Unit-I

3. Explain characteristics of computers and its applications. **10**

OR

Write short note on:

- a. Projector
- b. Audio Output
- c. OMR
- d. Optical Scanner

10

Unit-II

4. (a) Explain the functioning of CPU. **5**

- (b) Explain classification of secondary storage devices. **5**

OR

Convert the following:

- (a) $(4052)_6 = (?)_{10}$ (b) $(425)_{10} = (?)_2$

10

Unit-III

5. Explain generations and features of a good programming language. **10**

OR

Explain the following :

- a. System Software
- b. Hardware
- c. Pseudo Code
- d. Application Software

10

Unit-IV

6. What is Topology? Explain various types of topology in the computer networks. **10**

OR

Write short note on :

- a. Internet applications
- b. Types of transmission media

10

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SECOND PAPER

ELECTRICAL CIRCUIT & SEMICONDUCTOR PHYSICS

Paper Code:-42102

Time Allowed: Three Hours

Maximum Marks.70

(1) No supplementary answer book will be given to any candidate. Hence the candidates should write the answers precisely in the main answer book only.

(2) All the parts of one question should be answered at one place in the answer book.

(Attempt all six questions.)

Part I (Question No. 1 & 2) is compulsory & Part II (Question No. 3, 4, 5 & 6) has internal choice.

Part-I

1. Answer any 10 questions. Each question carries 1 mark.

10x1= 10

(Words limit up to 20 words each)

- a) What do you mean by conservation of charge?
- b) Define Electric Potential.
- c) State Coulomb's Law.
- d) What is resistivity of conductors?
- e) What is time constant of LR circuit?
- f) What do you mean by Magnetic Flux?
- g) What do you mean by Energy Bands?
- h) What are Covalent Bonds?
- i) Are N-type semiconductors electrically positive, negative or neutral?
- j) What do you mean by Depletion Region?
- k) Define Mobility of a charge carrier.
- l) What is Zener Diode?

2. Answer all the questions. Each question carries 5 marks.

4x5 = 20

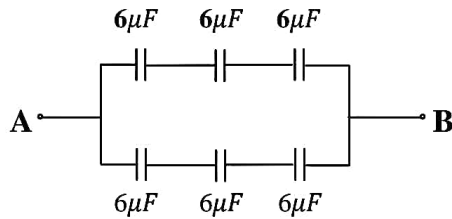
(Words limit up to 50 words each)

- a) State Gauss's Law of Electrostatics.
- b) Explain the magnetic energy stored in an inductor.
- c) Differentiate between insulator, conductor and semiconductor on the basis of band theory.
- d) Discuss extrinsic semi-conductors.

P.T.O.

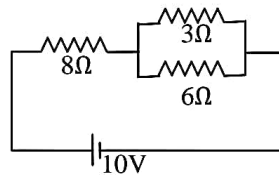
Part-II
Unit-I

3. (a) What is Electric Potential Energy? Derive an expression for potential energy of two charges separated by distance 'r'. 6
(b) Find the equivalent capacitance between A and B 4



OR

- (a) State Kirchhoff's Current Law and Voltage Law and give example for each law. 6
(b) Find the value of current in 3Ω resistance in the following circuit. 4



Unit-II

4. (a) State Biot-Savart's Law. Derive an expression for magnetic field due to a current carrying coil at its centre. 6
(b) The diameter of 200 turns circular coil is 20 m. Find the magnetic field at its centre when 3A current flows through it. 4

OR

- (a) Discuss Faraday's Law of electromagnetic induction and give example. 5
(b) Distinguish between diamagnetic, paramagnetic and ferromagnetic materials. 5

Unit-III

5. (a) Explain Intermolecular Forces. 5
(b) Write two names each for acceptor and donor type impurities. 5

OR

- (a) Write the elementary properties of Germanium and Silicon semiconductors. 5
(b) Discuss the process of conduction in semiconductors. 5

Unit-IV

6. Describe the working of full wave rectifier and derive an expression for ripple factor. 10

OR

- What do you mean by Bipolar Transistor Action? Explain the basic principle of operation of open circuited transistor. 10

BCA First Semester Examination, Dec.-2019

THIRD PAPER

Programming in 'C'

Paper Code:- 42103

Time Allowed: Three Hours

Maximum Marks.70

(1) No supplementary answer book will be given to any candidate. Hence the candidates should write the answers precisely in the main answer book only.

(2) All the parts of one question should be answered at one place in the answer book.

(Attempt all six questions.)

Part I (Question No. 1& 2) is compulsory & Part II (Question No. 3, 4 , 5 & 6) has internal choice.

Part-I

1. Answer any 10 questions. Each question carries 1 mark.

10x1= 10

(Words limit up to 20 words each)

- a) What is Pseudo Code?
- b) What is an Algorithm?
- c) What is Enumerated Data Type? Give an example.
- d) What are the different methods to declare a constant in 'C'?
- e) What is Type Casting? Give an example.
- f) What is the difference between a do-while loop and a while loop?
- g) What is data type of a Pointer Variable?
- h) What is a NULL pointer? Give example.
- i) What is the difference between actual and formal parameters?
- j) What are Static Variables?
- k) What is the difference between Structure and Union?
- l) What is Binary Data File?

2. Answer all the questions. Each question carries 5 marks.

4x5 = 20

(Words limit up to 50 words each)

- a) Explain different data types available in 'C'.
- b) Write a 'C' program to find the length of a string without using built-in functions.
- c) How a string can be passed to a function as parameter? Explain with an example.
- d) Explain different types of Console I/O functions available in 'C' with suitable examples.

P.T.O.

Part-II

Unit-I

3. Discuss different types of operators available in C with suitable examples. **10**

OR

What are Preprocessors? Discuss some important preprocessors with their role in a C program. **2+8**

Unit-II

4. Explain the following string functions with suitable examples: **4x2.5**
(a) getch() (b) getchar() (c) getche() (d) scanf()

OR

Write a program in C to print the sum of all the elements of every row and every column of a MxN matrix of integers. **10**

Unit-III

5. What do you mean by Recursion? Write a recursive program in 'C' to print all the elements of an array. **10**

OR

Write a program in 'C' to calculate the sum of all the elements of an array of N integers using pointers. **10**

Unit-IV

6. Write a program in 'C' to reverse the contents of a random file and print it. **10**

OR

Write a program using structures to count the total number of days elapsed between two given dates. **10**

BCA First Semester Examination, Dec-2019**FOURTH PAPER****Discrete Mathematics**

Paper Code-1741

Time Allowed: Three Hours**Maximum Marks.70**

(1) No supplementary answer book will be given to any candidate. Hence the candidates should write the answers precisely in the main answer book only.

(2) All the parts of one question should be answered at one place in the answer book.

(Attempt all six questions.)

Part A and Part B are compulsory (Question No. 1 & 2) & Part C (Question No. 3, 4, 5 & 6) has internal choice.

Part-A

1. Answer any 10 questions. Each question carries 1 mark.

10x1= 10

(Words limit up to 20 words each)

- Find the value of $(A - \phi) \cup (\phi - A)$ for any set A .
- Determine $\left| P \left(P(P(\phi)) \right) \right|$, where P denotes power set.
- Convert $(42)_{10}$ into binary number system.
- Find the total number of relations on the set $S = \{1,2,3\}$.
- How many words can be formed from the word "LAUGHTER".
- Define Inverse Relation of a Relation.
- Write distribution laws for p, q and r .
- Write absorption laws for p and q .
- Construct a truth table for the statement $(p \vee q) \rightarrow q$.
- Find the number of edges in the graph $K_{3,4}$.
- Draw the wheel graph W_4 .
- Draw all the trees with 5 vertices.

2. Answer all the questions. Each question carries 5 marks.

4x5= 20

(Words limit up to 50 words each)

- If A, B and C are three sets, then prove that

$$A \times (B \cup C) = (A \times B) \cup (A \times C)$$

- Prove by the principle of mathematical induction that

$$1^3 + 2^3 + \dots + n^3 = \left(\frac{n(n+1)}{2} \right)^2 = \frac{1}{4} n^2 (n+1)^2$$

- Show that the complete bipartite graph $K_{3,3}$ is non-planar.
- Using truth table, show that $\sim(p \vee q) \Leftrightarrow \sim p \wedge \sim q$.

Part-II

Unit-I

3. (a) Evaluate $(121)_8$ in hexadecimal number system. 5
(b) Evaluate $(3C5)_{16} + (7B5)_{16}$ in decimal form. 5

OR

- (a) Prove that $A \oplus (A \cap B) = A - B$. 5
(b) Define multiset and union and intersection of two multisets. 5

Unit-II

4. (a) How many integers are there between 1 and 1000 which are not divisible by 2, 3 and 5? 5
(b) Show that two equivalence classes are either identical or disjoint. 5

OR

- (a) If 10 identical coins are tossed, then find the total number of different outcomes. 5
(b) 45 candidates appear in a competitive examination. Prove that there are at least two candidates whose roll numbers differ by a multiple of 44. 5

Unit-III

5. (a) Show that the compound statement $(p \vee q) \wedge (p \downarrow q)$ is a contradiction. 5
(b) Show that $(p \wedge q) \wedge r \Leftrightarrow p \wedge (q \wedge r)$, using truth table. 5

OR

- (a) Find the validity of the following: 5
either Mohan is criminal or Sohan is speaking truth. Sohan is not speaking truth, therefore Mohan is criminal.
(b) Show that $p \leftrightarrow q$ and $(p \wedge q) \vee (\sim p \wedge \sim q)$ are logically equivalent. 5

Unit-IV

6. (a) Find all the spanning trees of the complete graph K_4 . 5
(b) Prove that in a graph G , the number of odd vertices is always even. 5

OR

- (a) Prove that a connected graph is an Euler graph iff it has no vertex of odd degree. 5
(b) Show that a tree with n vertices has exactly $(n - 1)$ edges. 5
