S. S. JAIN SUBODH P.G.(AUTONOMOUS) COLLEGE, JAIPUR

Affiliated to University of Rajasthan, Jaipur

I CIA BCA I Semester Test, Dec. 2021

Discrete Mathematics

Max. Marks: 30 **Duration**: 1 Hour

Instructions to the Candidates

Note:- **Section A** : Consists of three short answer type questions, each carrying 7.5 marks. The candidates are required to attempt any two (7.5x2=15 marks)

Section B : Consists of one descriptive question of 15 marks with an internal choice.

Section A

1. Out of 20 members in a family, 11 like to take tea and 14 like coffee. Assume that each member likes at least one of the two drinks. How many like :
   (a) Both tea and coffee
   (b) Only tea and not coffee
2. Define Equivalence Relation and give an example of an Equivalence relation.
3. Define a Symmetric and an Anti symmetric relation giving an example in each case.

Section B

4. (a) By the principle of mathematical induction prove that

$$1.2 + 2.3 + \cdots + n(n+1) = \frac{n(n+1)(n+2)}{3} \text{ where } n \in N.$$

   (b) In how many ways can the letters of the word INSTITUTION be arranged so that (i) all vowels occur together, (ii) Consonants and vowels occur alternately.

OR

   (a) By the principle of Mathematical induction, prove that $10^n + 3.4^{n+2} + 5$ is divisible by 9, where $n \in N$.

   (b) Show that the relation "is congruent to" on the set of all triangles in a plane is an equivalence relation.

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Fundamentals of Computer Science

Max. Marks: 30 **Duration**: 1 Hour

Instructions to the Candidates

Note:- **Section A** : Consists of three short answer type questions, each carrying 7.5 marks. The candidates are required to attempt any two (7.5x2=15 marks)

Section B : Consists of one descriptive question of 15 marks with an internal choice.

Section A

(1) Explain characteristics of computers.

(2) What are applications of computers?

(3) Discuss classification of computers.

Section B

(4) Describe generation of computers.

OR

What do you mean by Input Devices? Explain any four.

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Electrical Circuits and Semiconductor Physics

Max. Marks: 30 **Duration**: 1 Hour

Instructions to the Candidates

Note:- **Section A** : Consists of three short answer type questions, each carrying 7.5 marks. The candidates are required to attempt any two (7.5x2=15 marks)

Section B : Consists of one descriptive question of 15 marks with an internal choice.

Section A

Q.1 Define Conductor and Insulator. Explain quantization and Conservation of charge.

Q.2 What is Coulomb's Law? Draw the line of force for positive charge.

Q.3 What is a Condenser ? Explain its principle. How the capacity to store charge is increased?

Section B

Q.4 (a) State Gauss's Law of electrostatics. If $q_1, q_2, q_3 \ldots . q_n$ charges are inside the Gaussian surface then find total flux.

OR

What is meant by Electrical Potential ? Two equal charges each of $0.9\mu c$ are 6cm apart. Calculate the repulsive force between them.

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Programming in C

Max. Marks: 30 **Duration**: 1 Hour

Instructions to the Candidates

Note:- **Section A** : Consists of three short answer type questions, each carrying 7.5 marks. The candidates are required to attempt any two (7.5x2=15 marks)

Section B : Consists of one descriptive question of 15 marks with an internal choice.

Section A

(1) What do you mean by identifier in C language? Write the rules to declare it.

(2) Define Flow Chart and explain various symbols used in Flow Chart.

(3) Write an algorithm to calculate simple interest.

Section B

(4) Write a program to find greatest among three numbers.

OR

Explain different types of operators available in C.