1001N1508

Candidate's Seat No :_____

Integ. M.Sc. (CSF) Sem.-1 Examination

SEC-ICSF-116

Intro Maths in Compu Appli.

January-2024

Time : 1-00 Hours] **[Max. Marks : 25**

Ques.1 Answer the following questions:

i. a) Write relations R = {(x, x3) : x is a prime number less than 10} in roster form. Also write domain and range. 5 Marks

b) Find domain and range of real function f defined by $f(x) = \sqrt{x} - 1$.

ii. a) Let A = {1, 2} and B = {3, 4}, write A x B. How many sub sets will A x B have? List them. 5 Marks

b) Find the domain and range of the following real functions:

i. $f(x) = \sqrt{9} - x2$.

ii. $f(x) = 1 - |x - 3|, x \in R$.

OR

i. a) In survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H & I , 11 read both H & T and 8 read both T & I, 3 read all three newspaper. Find 5 Marks

i. The number of people who read at least one of the newspapers.

ii. The number of people who read exactly one newspaper.

b) If A x B = {(a, x), (a, y), (b, x), (b, y)}. Find A & B.

ii. a) Define Quantifier. 5 Marks

b) Write types of it and define them. Translate statement into logical expression: Not all birds can fly.

c)Negate the statements: Any integer is either +ve or -ve

Ques.2 Answer the following questions:

i. a) Verify whether following preposition is tautology or contradictory or contingency. 5 Marks

$$[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r).$$

b) Write the converse, inverse, and contrapositive of each of following replication.

i. If x and y are numbers such that $x = y$ then $x^2 = y^2$.

ii. If quadrilateral is square then it is a rectangle.

ii. a) Translate preposition into logical expression: Not all birds can fly. 5 Marks

b) Write Negation of following statement. Some numbers are irrational.

c) Prepare truth table for $(p \wedge q) \rightarrow (p \vee q)$.

OR

i. Say whether tautology or not. $(p \vee q \vee r)\ [\{(p \rightarrow q) \rightarrow q\} \rightarrow r] \rightarrow r$. 5 Marks

ii. Show that t is a valid conclusion from premises. $p \rightarrow q$, $q \rightarrow r$, $r \rightarrow s$, $\sim s$ and $p \vee t$. 5 Marks

Ques.3 Attempt any five out of six. 5 Marks

1. Write De Morgan's Law for mathematical logic.
2. Obtain disjunction normal form of $(p \rightarrow q) \wedge \sim q$.
3. Check validity of Argument: If this number is divisible by 6 then it is divisible by 3. This number is not divisible by 3. Therefore, this number is not divisible by 6.
4. Write in Roster form: A = {x : x is a two digit natural number such that the sum of its digits is 8}.
5. How many elements has P(A), if $A = \emptyset$?
6. What will be
   (i) $\emptyset' \cap A$
   (ii) $A \cup A'$.