Dr. Neel Kanth

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

B.Tech-IV Semester (CS/IT)

COURSE CODE: 18B11CI414 MAX. MARKS: 15

COURSE NAME: Discrete Computational Mathematics

COURSE CREDITS: 03 MAX. TIME: 1 Hour

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1. [CO-2]

(a) If power set of A, $P(A)$ has 256 elements then how many elements are there in set A. [1]

(b)Find the symmetric difference $A\Delta B$ for the sets $A = \{1,2,4,6,8,9\}$ and $B = \{1,3,4,5,7,8,9\}$.Moreover, for the given sets A and B compute $(A\Delta B) \cup (A \cap B)$. [2]

Q2. For the set of all non-negative integers, explain in which of the following cases the collection$\{Z_1, Z_2, Z_3\}$, is a partition:

(i) Z_1 = set of all odd positive integers; Z_2 = set of all even positive integers; $Z_3 = \{\phi\}$.

(ii) Z_1 = set of all odd positive integers; Z_2 = set of all even positive integers; $Z_3 = \{0\}$.

[CO-2][1]

Q3. Suppose a list A contains 35 students in a Mathematics class, and a list B contains 40 students in a Physics class. If there are 25 students common on both the lists, then find the number of students:

(i) Only on list B

(ii) On list A or B (or both)

[CO-2][2]

Q4.Let $S = \{1,2,3,4\}$ and R be a relation on set S defined by $R = \{(1,2), (2,1), (1,1), (2,2), (3,3), (4,4)\}$.

Find its equivalence classes and partition set(S/R) [CO-3] [2]

Q5. Let $A = \{1,2,3\}$ and R is a relation on set A defined by $R = \{(1,2), (2,3), (3,1)\}$.Find transitive closure of R. [CO-3][2]

Q6. Let $A = \{1,2,3,4\}, B = \{4,5,6\}$ *and* $C = \{6,7,8\}$.Let R *and* S be then relations from A *to* B *and* B *to* C defined by $R = \{(x,y): x + y = 2\}, S = \{(x,y): y - x = 1\}$.