BANKURA UNIVERSITY

B.Sc SIXTH SEMESTER EXAMINATION, 2021

Subject: Computer Science Course ID: 61518

Course Title: Discrete Structure

Full Marks: 40 Time: 2 hr

Answer all the Questions

UNIT- 1

1. Answer any five of the following questions: (5*2=10)

   a) What is meant by permutation?
   b) What is Set?
   c) What is function?
   d) What do you mean by mathematical Induction?
   e) What is relation?
   f) What is subset of a set?
   g) What is Universal Set?
   h) Define Graph.

UNIT – 2

2. Answer any four of the following questions: (5*4= 20)
   a) Explain different types of relations.
   b) Let f(x)= x+2 and g(x)= 2x+1, find $(f \circ g)(x)$ and $(g \circ f)(x)$.
   c) Find the number of permutation and combinations (${}^nP_r$ & ${}^nC_r$) if n=12 and r=2.
   d) Define recurrence relation with proper example.
   e) Define mathematical induction with proper example.
   f) Explain Pigeonhole principle.
   g) Using mathematical induction show that $1\times2 + 3\times4 + 5\times6 + \ldots\ldots\ldots\ldots + (2n-1)\times2n = \frac{n(n+1)(4n-1)}{3}$

UNIT- 3

3. Answer any one of the following questions: (10*1= 10)
   a) Solve the recurrence relation $F_n = 5F_{n-1} - 6F_{n-2}$ where $F_0 = 1$ and $F_1 = 4$.

b) With mathematical Induction formula prove that $3^n - 1$ is a multiple of 2 for n = 1,2,3,4,5 - - - - - - - - - - - - -.