Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2017**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14MA2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DISCRETE MATHEMATICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | In a survey of 260 college students, the following data were obtained: 64 had taken a mathematics course, 94 had taken computer science course, 58 had taken business course, 28 had taken both mathematics and business course, 26 had taken both mathematics and computer science course, 22 had taken both computer science and business course and 14 had taken all the three types of courses.   1. How many students had not taken none of the three courses? 2. Of the students surveyed how many had taken only computer science course? | CO1 | 10 |
| b. | Find GCD(190,34) using Euclidean Algorithm and write GCD = Sa+Tb. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Prove by Mathematical Induction | CO1 | 10 |
| b. | Let A =  Compute  ,  and A ⊙ BT. | CO1 | 10 |
| 3. |  | Let *S = {1,2,3,4}* and  Define a relation *R* on *A* such that *(a,b) R (a′,b′)* if and only if *a+b = a′+b′*. (i) Show that *R* is an equivalence relation and (ii) Find A/R | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Find the transitive closure on the set A={1,2,3,4} using Warshall’s Algorithm for . | CO2 | 10 |
|  | b. | Choose *R* and *S* be relations on *A = {a,b,c,d}* whose matrix forms are  and . Compute  and | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | Assume *A={1,2,3,4,12}* and  *a ≤ b iff a | b* . Draw the Hasse diagram of the poset *(A,≤)*. | CO2 | 10 |
|  | b. | Consider the Boolean polynomial p(x, y) = . If compute the truth table of the function f :  defined by p. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Show that D30  is a Boolean Algebra. | CO2 | 12 |
|  | b. | Construct the tree diagram for the given expression and also find Preorder, Inorder and Postorder. | CO2 | 8 |
|  |  |  |  |  |
| 7. | a. | Find the chromatic polynomial of the graph given below using the edge ‘e’ and hence find the chronmatic no. of G      G  e | CO3 | 10 |
|  | b. | Find a maximum flow in the given network by using the labeling algorithm.  C:\Documents and Settings\Staff\Desktop\lb.bmp | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Use Fleury’s Algorithm to find an Euler circuit for the graph given below. | CO3 | 10 |
|  | b. | Find the minimal spanning tree using Prim’s and Kruskal’s algorithm. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | Assume be a parity check matrix. Determine the (3,6) group code function . | CO2 | 20 |

ALL THE BEST