**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **2BC3187** | Roll No. | Total Printed Pages: 2 |
| **2BC3187** |  |
| BCA II Year III- Semester (Back) End Semester Examination, November 2022  **(AI&PA)** | |
| **BAP03104 : Elements of Discrete Mathematics** | | | |

# Time: **3** Hours. Total Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.--------------------------Nil--------------------** **2.------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** |
| **Q.1** | **(a)** | If A = {1,2,3,4} and B= {4, 5,6,7}. Find | **(8)** |
|  |  |  |  |
|  |  |  |  |
|  | **(b)** | Find the Domain and range of the function | **(4)** |
|  |  |  |  |
|  |  |  |  |
|  |  | **OR** |  |
|  |  |  |  |
| **Q.2** | **(a)** | To Prove that R in the set A = {1,2,3,4,5} is given by | **(6)** |
|  |  | Is equivalence relation |  |
|  |  |  |  |
|  | **(b)** | If A, B and C be the sets and . Then draw the Venn diagram of the following terminology | **(6)** |
|  |  |  |  |
|  |  |  |  |
|  |  | **UNIT-II (CO2)** |  |
|  |  |  |  |
| **Q.3** | **(a)** | Explain interjection and surjection, bijections function with diagram | **(4)** |
|  |  |  |  |
|  | **(b)** | Which of the following relation are function give with reason | **(8)** |
|  |  |  |  |
|  |  |  |  |
|  |  | **OR** |  |
|  |  |  |  |
| **Q.4** | **(a)** | If  **find** | **(6)** |
|  |  |  |  |
|  | **(b)** | To check the function  defined  (i) One- one (ii) Onto | **(6)** |
|  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |
|  |  |  |  |
| **Q.5** | **(a)** | Find the solution of following Recurrence relation | **(6)** |
|  |  |  |  |
|  |  |  |  |
|  | **(b)** | Find the solution of following Recurrence relation | **(6)** |
|  |  |  |  |
|  |  |  |  |
|  |  | **OR** |  |
|  |  |  |  |
| **Q.6** | **(a)** | Find the solution of following Recurrence relation | **(6)** |
|  |  |  |  |
|  |  |  |  |
|  | **(b)** | Find the solution of following Recurrence relation | **(6)** |
|  |  |  |  |
|  |  | **UNIT-III (CO4)** |  |
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|  |  |  |  |
| **Q.7** | **(a)** | To Explain with diagram:  (i) directed graph (ii) path, (iii) cycles (iv) Wheel | **(2)** |
|  |  |  |  |
|  | **(b)** | Find the shortest path between the vertices A and G in the following directed weighted graph: | **(10)** |
|  |  | **OR** |  |
| **Q.8** | **(a)** | Varieties of graphs  Edge of graph  Degree of vertex | **(2)** |
|  |  |  |  |
|  | **(b)** | Draw graphs which are :  (i) Euler and Hamiltonian both (ii) Euler but not Hamiltonian  (iii) Hamiltonian but not Euler (iv) Neither Euler nor Hamiltonian  Include at least four vertices in these graphs. | **(10)** |
|  |  | **UNIT V (CO5)** |  |
| **Q.9** | **(a)** | Write down the adjacency and incidence matrices of the graph | **(4)** |
|  |  |  |  |
|  | **(b)** | Draw the graph whose incidence matrix is given | **(4)** |
|  |  |  |  |
|  | **(d)** | Explain the following terms  (i) roots and orderings, (ii) tree traversal,  (iii) infinite trees, (iv) spanning trees | **(4)** |
|  |  | **OR** |  |
| **Q.10** | **(a)** | Find the shortest path between the vertices A and F | **(4)** |
|  |  |  |  |
|  | **(b)** | Find the incidence matrix | **(4)** |
|  |  |  |  |
|  | **(C)** | Draw the graph whose adjacency matrix is given | **(4)** |
|  |  |  |  |