

B.C.A. - II (CBCS Pattern) Sem-III  
**UBCAT305 - Paper-V : Discrete Mathematics**

P. Pages : 2

Time : Three Hours



**GUG/W/22/11761**

Max. Marks : 40

- Notes :
1. All Questions are compulsory and carry equal marks.
  2. Draw neat and labelled diagrams wherever necessary.
  3. Avoid vague answers and write answers relevant and specific to questions only.

Either:

1. a) What is Set? Explain different operations on Set? 4
- b) If A and B are finite set, then  $|A \cup B| = |A| + |B| - |A \cap B|$  4

**OR**

- c) Prove that Statement  $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$  is a tautology. 4
- d) Prove that 4
- i)  $\overline{(A \cap B)} = \bar{A} \cup \bar{B}$  ii)  $(A \cup B) \cup C = A \cup (B \cup C)$

Either:

2. a) Prove that the number of permutations of 'n' thing taken all at a time is  $n!$  4
- b) Determine the number of permutations that can be made out of the letters of the word 4
- i) PROGRAMMING ii) BANANA

**OR**

- c) What is function and explain its types? 4
- d) Explain the Pigeonhole Principle with example 4

Either:

3. a) Define following terms: 4
- i) Graph ii) Adjacent Node
- iii) Parallel Edges iv) Loop
- b) Explain Hamiltonian path and Circuit with example? 4

**OR**

