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2402

BACHELOR OF COMPUTER APPLICATION

BCA (I Year) Examination, 2019

BASIC MATHEMATICS

Paper-II (BCA-102)

(Also Common for Due/Ex Candidates of 2014)

Time Allowed : Three Hours

Maximum Marks : 75

*Attempt **five** questions in all, selecting **one** question from each unit. **All** questions carry equal marks.*

*प्रत्येक इकाई में से **एक** प्रश्न का चयन करते हुए कुल **पाँच** प्रश्नों के उत्तर दीजिए । **सभी** प्रश्नों के अंक समान हैं ।*

UNIT-I

1. (*i*) If m times the mth term of an AP is equal to n times its nth term, show that the $(m + n)$th term of the AP is zero. 5

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(*ii*) The sum of three numbers in GP is 35 and their product is 1000. Find the numbers. 5

(*iii*) Insert 3 harmonic mean between 5 and 6. 5

2. (*i*) If the first term of an AP is 2 and the sum of first five terms is equal to one-fourth of the sum of the next five terms, find the sum of first 30 terms. 5

(*ii*) Insert 3 geometric mean between $\frac{1}{3}$ and 432. 5

(*iii*) Evaluate $\log_{10} 200 + \log_{10} 5$, without using the log table. 5

UNIT-II

3. (*i*) In a group of 52 persons, 16 drink tea but not coffee and 33 drink tea. Find how many drink coffee but not tea. 5

(*ii*) For any three set A,B,C, prove that : 5

$$A \cap (B - C) = (A \cap B) - C$$

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(iii) For any set A, B, prove that : 5

$$(A - B) \cup (B - A) = A \cup B - A \cap B.$$

4. Define the following with suitable examples : 5×3

(i) Null set

(ii) Infinite set

(iii) Open set

(iv) Cartesian product of sets

(v) Universal set.

UNIT-III

5. (i) Let R be an equivalence relation on a set A. Then prove that the equivalence classes determined by two elements are either disjoint or identical. 5

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UNIT-V

9. (i) Define the following with suitable examples : 2×2½

(a) Complete graph

(b) Adjacency matrix.

(ii) How many odd numbers less than 1000 can be formed by using the digits 0, 2, 5, 7; when the repetition of digits is allowed ? 5

(iii) Prove that : 5

$$^{n}C_{r} + {}^{n}C_{r+1} = {}^{n+1}C_{r+1}.$$

10. (i) If $^{56}P_{r+6} : {}^{54}P_{r+3} = 30800 : 1$, find r. 5

(ii) How many diagonals are there in a polygon of n sides ? 5

(iii) Define the following with suitable examples : 2×2½

(a) Directed graph

(b) Tree.

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