



UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

BCA 1ST YEAR 2ND SEMESTER ASSIGNMENT

Last Date of Submission: 15 July 2015

Course Title: Discrete Mathematics

Course Code: BCA-05

Year: 2014-15

Maximum Marks: 40 Marks

Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answer 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.

1. If $f(x)=3x-5$ and $f(g(x)) = 2x$, then find $g(x)$.
2. Write the contrapositive, converse and inverse of the following statement :
"If it is cold, then she wears a coat."
3. Use mathematical induction to prove that n^3-n is divisible by 3, whenever n is a positive integer.
4. In how many ways can the letters of the word ABACUS be rearranged such that the vowels always appear together?
5. In an examination 70% of the candidates passed in English, 65% in mathematics, 27% failed in both the subjects and 248 passed in both the subjects. Find the total number of candidates.
6. Show that $p \leftrightarrow q$ and $(p \rightarrow q) \wedge (q \rightarrow p)$ are equivalent propositions.
7. If A and B are two square matrices of order $(n \times n)$ and $AB=I$, then prove that $BA=I$.
8. Prove that $A \cup A' = U$ and $A \cap A' = \phi$.

Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answer 02 questions only.

1. Let A and B be two sets, prove that $A \cup B = B \cup A$.
2. Show that every square matrix can be uniquely expressed as the sum of a symmetric and a skew symmetric matrix.
3. Show that $p \rightarrow \sim q$ is a valid conclusion from the given premises: $p \rightarrow q, r \rightarrow \sim q$
4. a. Prove that Z_n is not a field, if n is a composite number.
b. Prove that every field is a ring but not every ring is field.