BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-I : WINTER : 2021
SUBJECT: BUSINESS MATHEMATICS

Day : Saturday
Date : 22-01-2022

W-18755-2021

Time : 10:00 AM-01:00 PM
Max. Marks: 60

N.B.:

1) Q.4 from Section-I is COMPULSORY.
2) Answer ANY TWO questions from Q. 1, 2, 3 in Section-I.
3) Answer ANY TWO questions from Q. 5, 6, 7 in Section-II.
4) All question CARRY EQUAL marks.
5) Answers to Both the sections to be written in SAME answer book.
6) Draw a labeled diagram WHEREVER necessary.

SECTION - I

Q.1) Answer the following: (6 Marks X 2 = 12)

a) If U is the universal set and A ,B are subsets of U such that n(U)=100, n(A') = 60, n(B')=45 and n[(A ∪ B)'] = 10 ;
Find (i) n (A ∩ B) ; (ii) n(A' ∪ B')

b) Let f: R → R and g : R → R be given by $f(x) = x^3$ and $g(x) = x^2 - 1$.

Find (i) f o f (ii) g o g

Q.2) Answer the following: (6 Marks X 2 = 12)

a) Prepare the truth table for (p → q) ∨ (~ p ∨ ~ q)

b) By using appropriate method find the inverse of the matrix A = $\begin{bmatrix} 6 & 2 & 2 \\ -3 & 7 & 1 \\ 3 & 5 & -1 \end{bmatrix}$

Q.3) Explain the following: (6 Marks X 2 = 12)

a) How many 4-digit numbers that are divisible by 10 can be formed from the numbers 3, 5, 7, 8, 9, 0 such that no number repeats?

b) To perform an experiment, two coins are tossed simultaneously. Find probability of –
   i) Both of the coins showing 'Head'
   ii) Showing one head and one tail.

Q.4) Write short notes on the following: Attempt ANY THREE (4 Marks X 3 = 12)

a) Types of sets
b) Relations
c) Properties of Matrices
d) Combination
e) Multiplication theorem in probability

SECTION - II

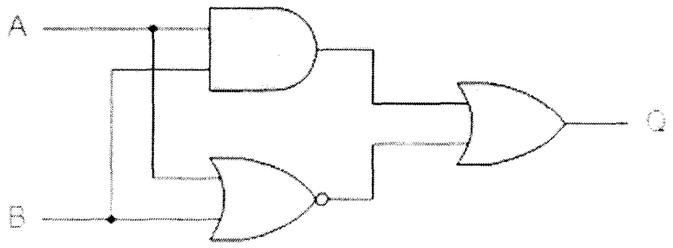
Q.5) Answer the following: (6 Marks X 2 = 12)

a) In a group of 50 students, there are 30 males and 40 vegetarians and 25 male vegetarians. Draw the Venn diagram to illustrate the above facts and find the number of (i) female vegetarians (b) male and female non- vegetarians.

b) Let $f(x) = x^2 + 1$. Show that $f \circ f \neq f^2$

Q.6) Answer the following: (6 Marks X 2 = 12)

a) Find the Boolean algebra expression for the following system.



b) Find the matrix X, such that $2X + 3A - 4B = 0$, where $A = \begin{bmatrix} 2 & -2 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}$

Q.7) Explain the following: (6 Marks X 2 = 12)

a) There are 6 periods in each working day of a school. In how many ways can one organize 5 subjects such that each subject is allowed at least one period?

b) In a recent survey in a Statistics class, it was determined that only 60% of the students attend class on Thursday. From past data it was noted that 98% of those who went to class on Thursday pass the course, while only 20% of those who did not go to class on Thursday passed the course.

(a) What percentage of students is expected to pass the course?

(b) Given that a student passes the course, what is the probability that he/she attended classes on Thursday?

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