

S.D.E.

B.C.A. SEM – I (CBCS - 2018 Course) : WINTER - 2018

SUBJECT : BUSINESS MATHEMATICS

Day : Monday
Date : 03/12/2018

W-2018-4499

Time : 02.00 PM TO 05.00 PM
Max. Marks : 70

N.B.:

- 1) Attempt **ANY FOUR** questions from Section – I and attempt **ANY TWO** questions from Section – II.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 a) Find the number of ways in which 6 boys and 6 girls can be arranged in a row [05]
under the following conditions.

- i) Two girls should not be seated together.
- ii) Boys occupy the extreme positions.

b) Construct truth table for: $(p \rightarrow q) \rightarrow r$. [05]

Q.2 Define 'Function' with their types and illustrate with example of each type. [10]

Q.3 a) Prove by using Venn diagram: [05]
 $(A \cup B)' = A' \cap B'$.

b) A card is drawn randomly from a pack of cards. Find the probability that, the [05]
card selected is either a king or a red card.

Q.4 Find $AB^2 - A^T$, if $A = \begin{bmatrix} 3 & 2 & -4 \\ -3 & 4 & -6 \\ 3 & 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 & 1 \\ -1 & -2 & 3 \\ 4 & 5 & 3 \end{bmatrix}$. [10]

Q.5 Write short notes on **ANY TWO** of the following: [10]

- a) Logic gates
- b) Sum and Product Rule
- c) Conditional probability

Q.6 a) Determine whether the following compound propositions are true or false: [05]

- i) Delhi is the capital of India but Washington D.C. is not the capital of USA.
- ii) Either $2 > 3$ or $5 > 7$.
- iii) $4 > 2$ but $3 \neq 5$.
- iv) Neither $5 < 4$ nor $7 > 5$.

b) Define composite function with suitable example. [05]

P.T.O.

SECTION – II

Q.7 a) Let $A = \{(1, 2, 3)\}$. Consider the following relations: **[09]**

i) $R_1 = \{(1, 1), (2, 3), (3, 3)\}$

ii) $R_2 = \{(1, 1), (2, 2), (2, 3), (3, 3), (3, 2)\}$

iii) $R_3 = \{(1, 1), (2, 2), (3, 3)\}$

Determine whether above relations are reflexive, symmetric or transitive.

b) Prove the following identity for three sets: **[06]**

$$X \cup (Y \cap Z) = (X \cup Y) \cap (X \cup Z).$$

Q.8 Solve the linear system by using matrix method: **[15]**

$$2x + 3y - z = 6$$

$$x + y + 3z = 3$$

$$2x + 2y = 6$$

Q.9 A factory has three units A, B and C to manufacture the same item. A, B and C produce 25%, 30% and 45% of the total production respectively. From the output of A, B and C it has been observed that 2%, 3% and 4% items are defective respectively. An item is selected randomly and it is found to be defective. What is the probability that it was manufactured by A, B and C? **[15]**

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