

B.C.A. (2010 COURSE SEM- I : SUMMER - 2018)
SUBJECT : MATHEMATICS – I (LOGIC, SETS AND FUNCTIONS)

Day : **Monday**
Date : **07/05/2018**

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

S-2018-1722

N. B. :

- 1) **Q. No. 1 is COMPULSORY.**
- 2) Attempt **ANY FOUR** question from **Q. No. 2** is **Q. No. 7.**
- 3) Figures to the right indicate **FULL** marks.
- 4) Use of non-programmable calculator is **ALLOWED.**

Q. 1 a) Write note on various types of functions. **(07)**

b) Let $A = \{a, b, c, d, e\}$ $B = \{a, b, d, f, g\}$ **(07)**

$$C = \{b, c, e, j, h\} \quad D = \{d, e, f, g, h\}$$

Find : **i)** $A \cap (B \cup D)$ **ii)** $C \cup (B \cap D)$

Q. 2 a) Construct truth table for a logical statement given below and put comment on last column $(p \wedge q) \wedge \sim (p \wedge r)$. **(07)**

b) An urn contains 4 red, 3 white and 3 black balls. If two balls are drawn at random. Find the probability for - selected balls are not of the same colour. **(07)**

Q. 3 a) A farmer buys 3 cows, 2 pigs and 4 hens from a man who has 6 cows, 5 pigs and 8 hens. How many choices does the farmer have? **(07)**

b) Compute : 8P_3 and ${}^{52}C_2$ **(07)**

Q. 4 a) Find value of "x" if $|A| = 0$. **(07)**

$$A = \begin{bmatrix} 9 & 3 & x \\ 2 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$$

b) Find GCD of 26 and 118 and express in the form of $26x + 118y$ **(07)**

Q. 5 Discuss various types of matrices with their suitable examples. **(14)**

Q. 6 a) Use principle of Mathematical Induction to prove for all $n \in N$. **(07)**
 $1 + 3 + 5 + \dots + (2n - 1) = n^2$.

b) Discuss "Set Theory" with the help of : **(07)**

- i)** Types of sets **ii)** Algebra of sets

Q. 7 Write short notes on **ANY TWO** of the following: **(14)**

- a)** Logical Equivalences
- b)** Division Algorithm
- c)** Complexity of Algorithm

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