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MAE-658

Seat No. _____

B. Sc. (Sem. III) Examination

October / November - 2018

Mathematics : Paper - ESMATH-21

(Business Mathematics - I)

(Elective Course)

Time : **2** Hours] [Total Marks : **50**

Instructions : (1) There are two questions.
(2) Figures to the right indicate marks of the corresponding question.

1 Attempt any **four** : **20**

(a) Verify the following statements by constructing truth table :

(i) $p \vee [\sim(p \wedge q)]$ is a tautology

(ii) $(p \wedge q) \wedge [\sim(p \vee q)]$ is a fallacy

(b) Construct truth table for

$$p \Rightarrow [(q \vee r) \wedge \{\sim(p \Leftrightarrow \sim r)\}]$$

(c) Out of 880 boys in a school, 224 played cricket; 240 played hockey and 336 played basketball; 64 played both basket-ball and hockey; 80 played cricket and basketball; 40 played cricket and hockey; 24 played all the three games.

(i) How many boys did not play any game.

(ii) How many boys played only one game.

(d) If $n(A \cup B \cup C) = 1000$; $n(A) = 658$; $n(B) = 372$; $n(C) = 590$; $n(A \cap B) = 166$; $n(B \cap C) = 434$; $n(A \cap C) = 126$; then find out $n(A \cap B \cap C)$ and $n[A \cap (B \cup C)]$.

(e) What is the relationship between the following sets ?

$A = \{x/x$ is a letter in the word FLOWER$\}$

$B = \{x/x$ is a letter in the word FLOW$\}$

$C = \{x/x$ is a letter in the word WOLF$\}$

$D = \{x/x$ is a letter in the word FOLLOW$\}$

2 Attempt any **five** : **30**

(a) Find the number of permutations of the following words :

(i) ACCOUNTANT

(ii) ENGINEERING

(iii) MATHEMATICS

(b) (i) Evaluate : $15P_3 + 4P_3 + 6P_6$

(ii) Find n; $(n+3)P_6 : (n+3)P_4 = 14 : 1$

(c) From 6 boys and 4 girls; 5 are to be selected for admission for a particular course. In how many ways can this be done if there must be exactly 2 girls ?

(d) (i) Find the value of r if ${}^{18}C_r = {}^{18}C_{r+2}$

(ii) Find the value of n if ${}^{n}C_6 : {}^{(n-3)}C_3 = 91 : 4$

(e) In an examination paper on Mathematics; 10 questions are set. In how many different ways can an examine choose 7 questions.