NE-124

December-2015

S.Y.M.B.A. Integrated

Business Mathematics

Time : 3 Hours]   **[Max. Marks : 100**

Instruction :   Non-programmable scientific calculator can be used.

1. Attempt any **two** :   **20**

   (A) (1) $^{56}P_{r+6} : {}^{54}P_{r+3} = 30800 : 1$. Find value of r.   **5**

       (2) $^{2n}C_3 : {}^nC_3 = 11:1$. Find value of n.   **5**

   (B) (1)   How many words can be formed from the letters of the word "TRIANGLE" ? **5** How many of these will begins with "T" and end with "E" ?

       (2) $^{2n+1}P_{n-1} : {}^{2n-1}P_n = 3:5$. Find value of n.   **5**

   (C) What is the number of ways of choosing 4 cards from a pack of 52 playing cards ? In how many of these   **10**

      (i)   Four cards are of the same suit.

      (ii)   Four cards belong to four different suits.

      (iii)   Four cards are face cards.

      (iv)   Two are red and two are black.

      (v)   Cards are of the same colours.

2. Attempt any **two** :   **20**

   (A) (1)   A pairs of dice is thrown. If the two numbers appearing on them are different, find the probability that (i) sum of the number is 6, (ii) sum of the number is 4 or less.   **5**

       (2)   The probability that a person will get an electric contract is 2/5 and the probability that he will not get plumbing contract is 4/7. If the probability of getting at least one contract is 2/3, what is the probability that he will get both ?   **5**

   (B) (1)   A random variable X has following probability distribution. Find the value of K. And also find mean and variance.   **5**

X_i	–2	–1	0	1	2	3
P_i	0.1	K	0.2	2K	0.3	K

       (2)   In meeting 70% of members favour a certain proposal. 30% being opposed. A numbers is selected at random and let X = 0 if he opposed and X = 1 if he is in favour. Find E(X) and V(X).   **5**

(C) A company has two plants to manufacture scooters. Plant-I manufactures 70% of the scooters. Plant-II manufacturers 30%. At plant-I, 80% of the scooters are rated as of standard quality and at plant-II, 90% of the scooters are rated as of standard quality. A scooter is chosen at random and is found to be of standard quality. What is the probability that it has come from plant-II ? **10**

3. Attempt any **two** : **20**

   (A) (1) Find the middle term in the expansion of $\left(2x^2 - \dfrac{1}{x}\right)^7$. **5**

      (2) Prove the following by the principle of mathematical induction. **5**
$$\frac{1}{3.7} + \frac{1}{7.11} + \frac{1}{11.15} + \cdots\cdots + \frac{1}{(4n-1)(4n+3)} = \frac{n}{3(4n+3)}$$

   (B) (1) Sum to n terms the series **5**
7 + 77 + 777 + …… + 777 …..7

      (2) If the coefficients of $(2r + 1)^{th}$ term and $(r + 2)^{th}$ term in the expansion of $(1 + x)^{43}$ are equal find r. **5**

   (C) (1) Find the term independent of x in the expansion of the expression $\left(3x - \dfrac{2}{x^2}\right)^{15}$. **5**

      (2) By the method of induction, show that $2.7^n + 3.5^n - 5$ is divisible by 24. **5**

4. Attempt any **two** : **20**
   (A) There are 25 trees at equal distances of 5 metres in a line with a well, the distance of the well from the nearest tree being 10 metres. A gardener waters all the trees separately starting from the well and he returns to the well after watering each tree to get water for the next. Find the total distance the gardener will cover in order to water all the trees. **10**

   (B) The sum of three numbers which are consecutive terms of an A.P is 21. If the second number is reduced by 1 and the third is increased by 1, we obtain three consecutive terms of a G.P. find the numbers. **10**

   (C) The sum of n terms of the G.P 3, 6, 12 …… is 381. Find the value of n. **10**

5. Attempt any **two** : **20**
   (A) If $\sqrt{5} = 2.236, \sqrt{6} = 2.449, \sqrt{7} = 2.646, \sqrt{8} = 2.828$ then find the values of $\sqrt{5.5}$. **10**

   (B) Using the Lagrange's Formula of interpolation, find from the data given below the number of workers earning between ₹ 3,000 and 4,000. **10**

Earning in ('00 ₹)	15-20	20-30	30-45	45-55	55-70
No. of workers	73	97	110	180	140

   (C) The number of member of International statistical society is given below. Make the best estimate you can of the members in 1972 and 1976. **10**

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Female	845	867	–	846	821	772	–	757	761	769