BBG-010-001307   Seat No. _____

B. B. A. (Sem. III) Examination

July – 2021

Statistics : Paper-307

(Business Statistics-1) (Old Course)

Faculty Code : 010
Subject Code : 001307

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

1 (a) Define the following terms :   **7**

   (1) Mutually exclusive events

   (2) Independent events

   (3) Exhaustive events

   (b) A husband and wife appear in an interview for two   **7**
        vacancies in the same post. The probability of husband's
        selection is 2/5 and that of wife's selection is 4/5. What
        is probability that only one of them will be selected ?

OR

1 (a) State and prove the multiplication theorem of   **7**
        probability.

   (b) If A,B,C are three mutually exclusive and exhaustive   **7**
        events and

        5P(A) = 6P(B) = 4P(C) then find $P(A \cap B)$ and $P(A' \cup B')$.

2 (a) Define probability density function of a normal variable   **7**
        X and state its properties.

   (b) If a random variable X assumes the values 0, 1 and   **7**
        2 with its respective probabilities 0.30, 0.50 and 0.20,
        then find its mean and variance. Also calculate
        E(3x – 2) and V(2x + 3).

OR

2 (a) Of a large group of men, 15% are less than 60 inches 7
in height and 30% are greater than 75 inches. Assuming
a normal distribution, find the mean height and standard
deviation.

[Given $P(-\infty < Z < 0) = 0.5$, $P(0 < Z < 1.035) = 0.35$,
$P(0 < Z < 0.525) = 0.20$]

(b) Suppose an insurance company offers a 45 years old 7
man Rs. 1000 one year term insurance policy for an
annual premium of Rs. 12. Assume that the number of
death per one thousand is five for person in this age
group. What is the expected gain for the insurance
company on a policy of this type ?

3 (a) State the properties of Poisson distribution. 7

(b) The incidence of Malaria in India was such that person 7
had 25% chance of suffering from it. What is the
probability that out of 5 persons, 3 or more will contact
the disease?

OR

3 (a) Find the number of trials of a binomial distribution 7
having mean and variance as 20 and 16 respectively.
Also find $P(X=0)$.

(b) If 1.5 per cent of item produced by a manufacturing 7
company are known to be defective. What is the
probability that a sample of 200 item would contain
atleast one defective item ?
[Given $e^{-1.5} = 0.2231$, $e^{-3} = 0.04979$]

4 (a) Give the difference between population survey and 7
sample survey.

(b) Explain systematic sampling. 7

OR

4 (a) Explain methods of simple random sampling. 7

(b) Write short note on stratified random sampling. 7

5 An ice cream manufacturer estimates the probability of **14**
the demand of the ice cream as under :

Number of Units (in Kg)	17	18	19	20
Probability	0.33	0.26	0.30	0.11

Each unit of the ice cream costs him Rs. 120 and its selling price Rs. 140. The unsold units of the ice cream can be sold at discount rate of Rs. 100 each at the end of the day. How many units of the ice cream should be manufacture daily to maximize his profit ?

OR

5 Select the best act from the given payoff table using : **14**

(i) Hurwicz principle taking $\alpha = 0.45$

(ii) Minimax Regret Criterion :

State of Nature	Act			
	A_1	A_2	A_3	A_4
S_1	70	40	−35	−15
S_2	60	35	80	48
S_3	40	30	40	45
S_4	50	45	50	55