

Seat No. : _____

AK-108

April-2023

Int. I.M.B.A., Sem.-II

Foundation of Statistics – I (FoS – I)

Time : 2:30 Hours]

[Max. Marks : 70

- Instructions :**
- (1) This paper contains **FIVE** questions.
 - (2) **All** questions are compulsory.
 - (3) Question No. **2, 3, 4** have internal options.
 - (4) Figures in the right side in parenthesis indicate marks.

1. (a) What is sampling method ? Explain types of sampling in details. **14**
 (b) x is a Poisson variate and $P(x=3) = P(x=4)$, prove that $P(x=2) = 8e^{-4}$. Find out $P(x=1)$

2. The wheat crop grown per acre by farmers in different parts of a state is given below : **14**

Wheat crop per acre	20-25	25-30	30-40	40-50	50-60
No. of Farmer	12	23	45	29	7

Find Mean and Median, Mode for the wheat crop per acre.

OR

The following table shows data about the distance travelled (in km) by a salesman on different days. Find median Q_3 , D_8 and P_{62} .

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Distance travelled(km)	0-100	100-200	200-300	300-400	400-500	500-600
No. of days	5	18	24	7	5	1

3. (a) Write down properties of Mathematical Expectation. **7**
 (b) The probability distribution of a random variable x is as follows : **7**

x_i	-1	0	1	2	3	4
px_i	$\frac{1}{6}$	$\frac{1}{3}$	p	p	$\frac{1}{12}$	$\frac{1}{12}$

Find the value of p and hence, also obtain the expected value of x .

OR

- (a) Explain the following terms : 7
- (i) Bay's Theorem
 - (ii) Mutually Exclusive Event.
 - (iii) Equally Likely Event
 - (iv) Random Experiment
- (b) Three machines A, B and C produces 15%, 55% and 30% of items daily in a factory. The percentage of defective items of these machines are respectively 4%, 5% and 6%. An items is taken at random from the production and is found to be defective. Find the probability that it is produced by machine B. 7
4. (a) Write down Properties of Binomial Distribution. 7
- (b) In the production of electric fuses 2% are defective. Find probability of getting
 (i) all non-defective fuses in a box containing 100 fuses. (ii) At the most 2 defective fuses (iii) 3 defective fuses ($e^{-2} = 0.1354$) 7
- OR**
- (a) There are 40 screws in a packet of which 5 are defective. If 10 screws are taken at random from the packet. Find the probability that none of them is defective. Also find mean and variance of defective screws. 7
- (b) State Properties of Poisson Distribution. 7
5. (a) Difference between primary data and secondary data. 7
- (b) State the types of Diagrams. 7
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