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3 SEM TDC ECOH (CBCS) C 7

2021

(Held in January/February, 2022)

ECONOMICS

(Core)

Paper : C-7

(**Statistical Methods for Economics**)

Full Marks : 80

Pass Marks : 32

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following as directed : 1×8=8

(a) Mean deviation can be computed based on

(i) arithmetic mean

(ii) median

(iii) mode

(iv) All of the above

(Choose the correct option)

(b) The fourth moment about the mean measures

- (i) mean
- (ii) variance
- (iii) skewness
- (iv) kurtosis

(Choose the correct option)

(c) What is random event?

(d) If A and B are mutually exclusive events, then the probability of occurrence of either A or B denoted by P shall be given by _____.

(Fill in the blank)

(e) Normal distribution is a limiting case of binomial distribution when

- (i) n , the number of trials is infinitely large, i.e., $n \rightarrow \infty$
- (ii) neither p nor q is very small
- (iii) Both (i) and (ii)
- (iv) None of the above

(Choose the correct option)

(3)

(f) Sampling errors are non-existent in complete enumeration survey.

(Write True or False)

(g) If $r = -1$, it means there is _____ relationship.

(Fill in the blank)

(h) If $b_{xy} = -0.8$ and $b_{yx} = -1.2$, the correlation coefficient will be

(i) 0.98

(ii) -0.98

(iii) 98

(iv) None of the above

(Choose the correct option)

2. Write short notes on any *four* of the following : 4×4=16

(a) Conditions for an ideal measure of dispersion

(b) Probability density function

(c) Sample space and events

(d) Non-sampling errors

(e) Standard error of estimation

(4)

3. (a) Discuss the relationship among mean, median and mode. Which one is the best average and why? $5+6=11$

Or

- (b) From the data given below, find missing frequency when arithmetic mean is 28.
Also find median of the series : $6+5=11$

Profits per shop (in ₹)	0-10	10-20	20-30	30-40	40-50	50-60
No. of shops	12	18	27	?	17	6

4. (a) (i) Explain the addition theorem of probability using Venn diagrams in case of mutually exclusive events and events not mutually exclusive.
- (ii) If one card is drawn from a well-shuffled pack of card, what is the probability of getting either a king or a queen? $7+4=11$

Or

- (b) There are 3 economists, 4 engineers, 2 statisticians and 1 doctor. A committee of 4 members from them is selected.

Find the probability that the committee has—

- (i) one of each kind;
- (ii) at least one economist;
- (iii) a doctor as a member and three others. 3+4+4=11

5. (a) Briefly discuss the concept of mathematical expectation. The probability that a man fishing at a particular place will catch 1, 2, 3, 4 fish are 0.4, 0.3, 0.2 and 0.1 respectively. What is the expected number of fish caught? 6+5=11

Or

- (b) (i) Mention the properties of normal distribution.
 - (ii) Prove that Poisson distribution is a limiting case of binomial distribution. 4+7=11
6. (a) What are the main steps involved in a sample survey? Discuss the different sources of errors in such surveys. Discuss briefly how these errors can be controlled. 4+4+4=12

Or

- (b) The results of survey to know the educational attainment among 100 persons randomly selected in a locality are given below :

	Education			
	Middle	High school	College	Total
Male	10	15	25	50
Female	25	10	15	50
Total	35	25	40	100

Can you say that education depends on gender?

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7. (a) You are given the following data :

	X	Y
Arithmetic mean	36	85
Standard deviation	11	8

Correlation coefficient between X and Y = 0.66.

- (i) Find the regression equations.
- (ii) Estimate the value of X, when Y = 75. 8+3=11

(7)

Or

(b) Calculate correlation coefficient from the following data : 11

$$\begin{aligned} N &= 10, & X &= 140, & \Sigma Y &= 150, \\ \Sigma(X-10)^2 &= 180, & \Sigma(y-15) &= 215, \\ \Sigma(X-10)(Y-15) &= 60 \end{aligned}$$
