



UNIVERSITY OF KARACHI
TARGET PAPER ANNUAL EXAMINATION 2018

M.A ECONOMICS (PREVIOUS)
ADVANCED ECONOMIC STATISTICS (PAPER - III)
IMPORTANT QUESTIONS

1. (a) Bradford Electric Company is studying the relationship between Kilowatt hours (thousands) used and the number of rooms in private single family residence. A random sample of 10 homes yielded the following:

No. of Rooms	12	9	14	6	10	8	10	10	5	7
Kilowatt Hours	9	7	10	5	8	6	8	10	4	7

- i. Determine the Regression equation.
ii. Determine the Number of Kilowatt hours in thousands for a six-room house.
(b) Define Random Variables. Also explain the characteristics of Binomial and Poisson Distribution?
2. (a) Compute the Mean and Standard Deviation for the following Probability Distribution.

X	0	1	2	3	4	5
Probability	0.42	0.34	0.14	0.06	0.03	0.01

- (b) Suppose that 15% of the population is left handed. Find the probability that in a group of 10 individuals that there will be (i) At most two left hander (ii) At least one left hander (iii) Between three and five left hander inclusive (iv) Exactly 5 left hander.
3. (a) The marks given by two examiners to a group of 10 students in Statistics and Economics are given below:

Statistics	30	25	35	35	40	39	38	36	48	45
Economics	42	36	40	42	38	29	39	40	25	31

Calculate the Spearman Rank Correlation Coefficient. Is there any evidence of consistency in grading of the two examiners? Justify.

- (b) Calculate the third moment about the mean for the distribution given below:

X	12	14	16	18	20	22
F	1	4	6	10	7	2

4. (a) A manufacture has observed that the time elapsed between the placement of an order and its delivery is uniformly distributed between 80 and 160 minutes. What proportion of orders take between 1.5 and 2.5 hours to be delivered?
(b) The second moment about the mean of a symmetrical distribution is 25. What must be the value of the fourth moment about the mean in order that the distribution:
(i) leptokurtic (ii) mesokurtic (iii) platykurtic
5. (a) A bulb manufacturer tested the most recent batch of 1000 bulbs produced and found 50 of them defective. If a sample of three bulbs is randomly selected from the mixed batch, What is the binomial probability distribution of the number of defective bulbs in the sample?

(b) Over a period of 4 consecutive years an employee has received 7.2, 8.6, 6.9 and 9.88 annual pay increases. The ratios, therefore of each new salary to the previous year's salary are 1.072, 1.086, 1.069 and 1.098. Using logarithms find the Geometric means for these four ratios and then determine the average percent increase in any for this employee over the 4-year period.

6. (a) A vehicle on test travelled successive laps on the same circuit at speeds of 40, 50, 60 and 75 km/hr. Calculate its average speed using harmonic mean. On a later test, the speeds were recorded but for a different number of laps, two of being 40 km/hr and the other in order being 50, 45 and 70. Calculate the new average speed.

(b) Following table shows the data on advertising expenditure (A.E) and sales of a firm:

Year	2006	2007	2008	2009	2010	2011	2012	2013
A.E. (000 Rs.)	14	17	17	25	26	40	44	50
Sale (Lac Rs.)	7.0	7.6	7.8	9.0	9.2	10.8	11.2	11.5

Calculate the regression equation of the sales on advertising expenditure (A.E.)

7. (a) A factory has two machines which make cakes. The weights, correct to the nearest gram, of samples from machines are given in the table below. Find the coefficient of variation for both machines.

Machine A	60	62	61	59	63	60	58	62	64	63
Machine B	61	55	52	69	61	62	68	52	57	50

(b) The annual salaries of seven workers employed by a firm are: \$15, 000, \$22, 000, \$25, 000, \$17, 500, \$14, 500, \$32, 500, \$13, 250. A competitor has workers who earn a mean annual salary of \$21, 000 with a standard deviation of \$3, 000. Compare the relative variability of the two firms using coefficient of variation. Treat this data collection as population.

8. (a) In a bolt factory, machines A, B and C manufacture respectively 25, 35 and 40 percent of the total produce. The percentage of defective bolts of machines A, B and C are 5, 4 & 2. A bolt is selected at random and is found to be defective. What is the probability that it was manufactured by machine B?
 (b) Plot the following data showing daily wages in rupees of some workers during 2000-2010 and also find the trend by following methods. (i) Free Hand Curve (ii) Semi averages

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Wages	140	148	180	150	250	290	320	340	390	400	450

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