Reg. No. : ....

Code No. : 8814   Sub. Code : PESM 23

M.A. (CBCS) DEGREE EXAMINATION, APRIL 2019.

Second Semester

Economics – Core

STATISTICAL METHODS FOR ECONOMICS – II

(For those who joined in July 2017 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. In binomial distribution, formula of calculating mean is

    (a) $\mu = p + q$

    (b) $\mu = np$

    (c) $\mu = pq$

    (d) $\mu = qn$

(i) Test whether the mean productivity is the same for the different machine types (for $v_3 = 12$, $F_{0.05} = 3.49$)

(ii) Test whether the 5 men differ with respect to mean productivity (for $v_4 = 12$, $F_{0.05} = 3.26$).

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2. Outcomes of an experiment are classified as

   (a) Logged events

   (b) Exponential results

   (c) Results

   (d) Events

3. An error caused by observing a sample instead of the whole population

   (a) Sampling Error

   (b) Population Error

   (c) Sample Error

   (d) Both (a) and (b)

4. Standard error is

   (a) Mean deviation of a sample statistic

   (b) Median of a sample statistic

   (c) Standard deviation of a sample statistic

   (d) Mean minus standard deviation of a sample statistic

5. Criteria of selecting point estimator must include information of

   (a) Inefficiency   (b) Biasedness

   (c) Consistency   (d) Goods of fit

6. If true value of population parameter is 10 and estimated value of population parameter is 15 then error of estimation is

   (a) 5   (b) 25

   (c) 150   (d) 10/15

7. In a one-tail test for the population mean, if the null hypothesis is rejected when the alternative hypothesis is not true, then

   (a) a Type I error is committed

   (b) a Type II error is committed

   (c) a correct decision is made

   (d) a two-tail test should be used instead of a one-tail test

8. A statement about a population developed for the purpose of testing is called

   (a) Level of significance

   (b) Hypothesis testing

   (c) Hypothesis

   (d) Test statistic

9. Use of χ^2 test as a test of

   (a) Independence   (b) Goodness of fit

   (c) Homogeneity   (d) All the above

10. ANOVA was developed by

   (a) Jakob Bernoulli   (b) R. A. Fisher

   (c) Irvin Fisher   (d) W.Hooper

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) What are the properties of the Binomial Distribution?

   Or

   (b) A coin tossed six times. What is the probability of obtaining four or more heads?

12. (a) A persons throws 10 coins 500 times. Calculate the standard error.

   Or

   (b) Explain sampling distribution of means of sampling.

13. (a) State the differences between point estimates and Interval estimates.

   Or

   (b) Describe the properties of good estimator.

14. (a) Narrate the procedures of testing of hypothesis.

   Or

   (b) Discuss the types of errors in testing of hypothesis.

15. (a) A project yields an average of cash-flow of Rs.500/- lakhs with a standard deviation of Rs.60/- lakhs. Calculate the following probabilities:

   (i) Cash flow will be more than Rs.520 lakhs

   (ii) Cash flow will be between Rs. 680/- lakhs.

   Or

   (b) Define Chi-squire and state its properties.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) The customer accounts at certain departmental store have an average balance of Rs. 480/- and a standard deviation of Rs160/-. Assuming, that the account balances are normally distributed.

(i) What proportion of that accounts is over Rs.600/-? and

(ii) What proportion of that accounts is between Rs. 400 to Rs.600/-?

Or

(b) The following data show the number of seeds germinating out of 10 on damp filter for 80 set of seeds. Fit a binomial distribution to this data:

X	0	1	2	3	4	5	6	7	8	9	10
Y	6	20	28	12	8	6	0	0	0	0	0

17. (a) Examine the advantages and disadvantages of different methods of sampling.

Or

(b) Before an increase in excise duty on Tea 400 people out of sample of 500 persons were found to be tea drinkers. After an increase in duty, 400 persons were known to be tea drinkers in a sample in a sample of 600 people. Do you think that there has been a significantly decrease in the consumption of tea after the increase in the excise duty. (table value at 1% = 2.58).

18. (a) Fit a straight-line trend for the following series by using least squire methods. Estimate the value for 2012.

Year	2002	2003	2004	2005
Production of steel (m. tonnes)	60	72	75	65

Year	2006	2007	2008
Production of steel (m. tonnes)	80	85	95

Or

(b) A random sample of size 16 has 53 as mean. The sum of the squares of the deviations taken from mean is 135. Can this sample be regarded as taken from the population having 56 as mean? Obtain 95% and 99% confidence limits of the mean of the population ($V = 15$, $t_{0.05} = 2.13$ for $V = 15$, $t_{0.01} = 2.95$).

19. (a) (i) Intelligence test on two groups of boys and girls gave the following results.

	Mean	S.D.	N
Girls	75	15	150
Boys	70	20	250

Is there a significant difference in the mean scores obtained by boys and girls? ($Z_{0.01} = 2.58$).

(ii) Two samples of 100 electric bulbs each has mean 1500 and 1550 standard deviation 50 and 60. Can it be concluded two brands differ significantly at 1% level of significance ($Z_{0.01} = 2.58$).

Significant difference in the mean life of two brands of bulbs.

Or

(b) In a laboratory experiment, to random samples gave the following results.

Sample	Size	Sample mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

Test the equality of sample variance at 5% level of significance $F_{9,11} = 2.90$ and $F_{11,9} = 3.10$.

20. (a) 200 digits are chosen at random from a set of tables. The frequencies of the digits are as follows :

Digit :	0	1	2	3	4
Frequency :	18	19	23	21	16
Digit :	5	6	7	8	9
Frequency :	25	22	20	21	15

Use chi-square test to as the correctness of the hypothesis that the digits were distributed in equal numbers in the tables from which they were chosen (5% level of significance value is 16.22).

Or

(b) The following data represent the number of units of production per day turned out by 5 different workers using 4 different types of machine:

		Machine Type		
	A	B	C	D
Worker 1	44	38	47	36
2	46	40	52	43
3	34	36	44	32
4	43	38	46	33
5	38	42	49	39