

Reg. No. :

Code No. : 8784

Sub. Code : PESM 23

M.A. (CBCS) DEGREE EXAMINATION, APRIL 2018.

Second Semester

Economics

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 questions.

Choose the correct answer :

1. In binomial distribution, formula of calculating standard deviation is
 - (a) Square root of p
 - (b) Square root of pq
 - (c) Square root of npq
 - (d) Square root of np

- (b) 100 students at college level are graded according to their I.Q. and their conditions. Use chi-square test to find out whether there is any association between economic conditions and the level of I.Q. [At 5% level of significance $\chi^2_{0.05} = 0.599$].

Economic conditions	High	Medium	Low	Total
Rich	160	300	140	600
Poor	140	100	160	400
Total	300	400	300	1000



2. Normal distribution is also classified as
- (a) Gaussian distribution
 - (b) Poisson distribution
 - (c) Bernoulli's distribution
 - (d) Weighted average distribution
3. Which of the following formulae is used to determine how many people to include in the original sampling?
- (a) $\text{Desired sample size} / \text{Desired sample size} + 1$
 - (b) $\text{Proportion likely to respond} / \text{desired sample size}$
 - (c) $\text{Proportion likely to respond} / \text{population size}$
 - (d) $\text{Desired sample size} / \text{Proportion likely to respond}$
4. A set of elements taken from a larger population according to certain rules is
- (a) Sample
 - (b) Population
 - (c) Statistic
 - (d) Element
5. A confidence interval consist(s)
- (a) A confidence level
 - (b) A statistic
 - (c) A margin of error
 - (d) All the above

6. If true value of population parameter is 100 and estimated value of population parameter is 150 then error of estimation is
- (a) 50
 - (b) 250
 - (c) 15000
 - (d) 100/150
7. The purpose of hypothesis testing is to
- (a) Test how far the mean of a sample is from zero
 - (b) Determine whether a statistical result is significant
 - (c) Determine the appropriate value of the significance level
 - (d) Derive the standard error of the data
8. A statement about the value of a population parameter is called
- (a) Null hypothesis
 - (b) Alternative hypothesis
 - (c) Simple hypothesis
 - (d) Composite hypothesis



9. Use of χ^2 test as a test of
- Independence
 - Goodness of fit
 - Homogeneity
 - All the above
10. In the analysis of variance procedure, 'factor' refers to
- The dependent variable
 - The independent variable
 - The constant
 - The critical value of P

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) A bag contain 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of the ball drawn will be a multiple of 5 or 7 and 3 or 7.

Or

- (b) A bag contains 8 white and 4 red balls. 5 balls are drawn at random. What is the probability that 2 of them are red and 3 white?

12. (a) Give a detailed account on Law of statistical regularity with a suitable example.

Or

- (b) Write a detailed note on Sampling Errors and its types.

13. (a) What are the properties of good Estimator?

Or

- (b) Distinguish between point estimates and interval estimates.

14. (a) What are the procedures of testing of hypothesis?

Or

- (b) Elucidate 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.560 lakhs, (ii) Cash flow will be between Rs. 680/- lakhs.

Or

- (b) Narrate the uses of χ^2 .



PART C — (5 × 8 = 40 marks)

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

16. (a) The following table shows the number of customers returning the products in a marketing territory. The data is for 100 stores:

No. of returns	0	1	2	3	4	5	6
No. of stores	4	14	23	23	18	9	9

Fit a Poisson distribution.

Or

- (b) The customer accounts at certain departmental store have an average balance of Rs. 480/- and a standard deviation of Rs. 160/-. 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/-?

17. (a) Describe the different methods of sailing with a suitable example.

Or

- (b) A machine produced 20 defective articles in a batch of 400. After overhauling it produced 10 defects in a batch of 300. Has the machine improved? (Table value at 5% = 1.96)

18. (a) Fit a least square line for the following data. Also find the trend values.

X	1	2	3	4	5
Y	2	5	3	8	7

Or

- (b) Below are the figures of production (million tons) of a sugar

Year	2003	2004	2005	2006	2007	2008	2009
Production (M.tonnes)	80	90	92	83	94	99	92

- (i) Fit a straight line trend to these figures
(ii) Plot these figures on a two groups and show the trend line.
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 ($Z_{0.01} = 2.58$).

Or

- (b) In a laboratory experiment, two 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) 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

- (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 $v_4 = 12$, $F_{0.05} = 3.26$).

Or

