

YouTube/ Akwa Academy

HALF YEARLY EXAMINATION - 2023

12 - STD

TIME : 3.00 Hours

STATISTICS

Reg NO.

MARKS : 70

15 x 1 = 15

I. Choose the correct answer

1. Critical value at 5 % level of significance for two tailed large sample test is
a) 1.645 b) 2.33 c) 2.58 d) 1.96
2. What is the standard error of the sample proportion under H_0 ?
a) PQ/n b) PQ/\sqrt{n} c) pq/n d) pq/\sqrt{n}
3. For testing the hypothesis concerning variance of a normal population _____ is used
a) t test b) F-test c) z test d) χ^2 -test.
4. Paired t-test is applicable when the observations in both the samples are
a) Paired b) Correlated c) Equal in number d) all the above
5. ANOVA was developed by
a) S.D. Poisson (b) Karl Pearson (c) R.A. Fisher (d) W.S. Gosset
6. The formula for comparing three or more means in one-way analysis of variance is
(a) MST/MSE (b) TSS/SST (c) MSB/MST (d) MST/MSB
7. If $r = -1$, then the correlation is called
(a) perfect positive correlation (b) perfect negative correlation
(c) positive correlation (d) negative correlation
8. _____ is the Father of mental tests
a) R.A. Fisher b) Croxton and Cowden c) Francis Galton d) A.L. Bowley
9. The regression lines intersect at
a) (X, Y) b) (X, Y) c) $(0, 0)$ d) $(1, 1)$
10. The Dornish-Bowley's price index is the
a) geometric mean of Laspeyre's and Paasche's Price indices
b) arithmetic mean of Laspeyre's and Paasche's Price indices
c) weighted mean of Laspeyre's and Paasche's Price indices
d) weighted mean of Laspeyre's and Paasche's quantity indices
11. The consumer price index in 2000 increases by 80% as compared to the base 1990. A person in 1990 getting Rs. 60,000 per annum should now get
a) Rs. 1,08,000 p.a. b) Rs. 1,02,000 p.a. c) Rs. 1,18,000 p.a. d) Rs. 1,80,000 p.a.
12. The component having primary use for long term forecasting is
a) cyclical variation b) irregular variation c) seasonal variation d) trend
13. An additive model of time series with components, T, S, C and I is
a) $Y = T + S + C + I$ b) $Y = T + S + C + I$ c) $Y = TS + C + I$ d) $Y = T \times S \times C + I$
14. National Statistical Commission was formed on
a) January 12, 2006 b) April 12, 2006 c) June 12, 2006 d) July 12, 2006
15. The measurement scale of taste of a coffee is:
a) Nominal b) Ordinal c) Interval d) Ratio

II. Answer any 6 Questions. (Question No. 24 is compulsory)

16. What is inferential Statistics? 6 x 2 = 12
17. When paired t-test can be applied?
18. Write about the different types of Correlation
19. Write the two simple linear regression coefficients
20. Define base period
21. Write the normal equations used in method of least squares
22. List the points to be noted before fixing the project topic
23. Is there any mistake in the data provided about the regression lines $Y = -1.5x + 7$ and $X = 0.6y + 9$? Give reason

III. Answer any 6 Questions. (Question No. 33 is compulsory)

24. What are the division of CSO ? 6 x 3 = 18
25. State the properties of Chi-square distribution.
26. Compare one way and two way ANOVA
27. A set of 100 students is selected randomly from an institution. The mean height of these students is 163cms and the standard deviation is 10cms, Calculate the value of the test Statistic under $H_0: \mu = 167$

28. Test the consistency of the following data with the symbols having their usual meaning
 $N = 200$ (A) = 80 (B) 60 ($\alpha \times \beta$) = 100
29. Compute price index number by simple average of price relatives method using arithmetic mean and geometric mean

ITEM	Price in 2001	Price in 2002
A	6	10
B	2	2
C	4	6
D	10	12
E	8	12

30. Draw a trend line by the method semi averages

YEAR	2013	2014	2015	2016	2017	2018
Production (1000 tons)	59	62	69	72	78	79

31. Write down the definitions of vital statistics

32. Write any three properties of regression.

33. What are the precautions that should be taken in the constructing index numbers ?

IV. Answer all Questions

5 x 5 = 25

34. a) A survey was conducted with 500 female students of which 60% were intelligent, 40 had uneducated fathers, while 30% of the not intelligent female students had educated fathers. Test the hypothesis that the education of fathers and intelligence of female students are independent at 5% of significance (OR)

- a) Calculate the coefficient of correlation for the following data using ranks

Marks in Tamil	29	24	25	27	30	31
Marks in English	29	19	30	33	37	35

35. a) A car manufacturing company desires to introduce a new model car. The company claims that the mean fuel consumption of its new model car is lower than that of the existing model of the car which is 27 kms/litre. A sample of 100 cars of the new model is selected randomly and their fuel consumptions are observed. It is found that the mean fuel consumption of the 100 new model cars is 30 kms/litre with standard deviation of 3 kms/litre. Test the claim of the company at 5% level of significance (OR)

- b) Distinguish between correlation and regression

36. a) Find the seasonal variations for the following table

Quarter	2000	2001	2002	2003
I	65	58	70	60
II	58	63	59	55
III	56	63	56	51
IV	61	67	52	58

(OR)

- b) Briefly explain the characteristics of various stages in a project work

37. a) The table below gives the prices of base year and current year of 5 commodities with their quantities. Use it to verify whether Fisher's ideal index satisfies time reversal test

COMMODITY	UNIT PRICE	QUANTITY	UNIT PRICE	QUANTITY
A	4	40	5	60
B	5	50	10	70
C	8	65	12	80
D	6	20	6	90
E	7	30	10	75

(OR)

- b) Calculate the Karl Pearson's coefficient of correlation for the following data and interpret.

X	13	15	14	16	13	19
Y	16	17	10	19	15	21

38. a) A test was given to five students taken at random from XII class of three schools of a town. The individual scores are

School I	9	7	6	5	8
School II	7	4	5	4	5
School III	6	5	6	7	6

(OR)

- b) The number of pages typed by 5 DTP-operators for 1 hour in the morning sessions are 10, 12, 13, 8, 9 and the number of pages typed by them in the afternoon are 11, 15, 12, 10, 8. Is there any significant difference in the mean number of pages typed? ($\alpha = 5\%$)