



Gujarat Secondary and Higher Secondary Education Board, Gandhinagar

Diagnostic Test for Standard - 12th

Time: 3 Hours

STATISTICS 135 (E)

Total Marks: 80

- Instruction:** (1) This question paper consists of six sections (A, B, C, D, E and F).
(2) Use of normal calculator is acceptable.
(3) Answer the questions as per instruction.
(4) Figure to the right side indicate full marks of the questions

Section -A

1. Following I to XII are multiple choice questions. Select the correct option from the given options and write it (Each carries 1 marks) [12]

- I) In which year the Indian Statistical Institute was established?
(A) 1911 (B) 1921 (C) 1931 (D) 1951
- II) Which of the following is a proper method of getting supplementary information about the personal characteristics of the respondents?
(A) Questionnaire by post (B) Direct Inquiry
(C) Indirect inquiry (D) From the news paper
- III) Name the type of classification of the data related to the occupation and education of a person living in a certain region.
(A) Tabulation (B) Classification of numeric data
(C) Raw Distribution (D) Discrete frequency distribution
- IV) What is the geometric mean of 3 and 12?
(A) 4 (B) 6 (C) 15 (D) 36
- V) What is the value of any measure of dispersion for the observations 8, 8, 8, 8, 8?
(A) 1 (B) 8 (C) 0 (D) 40
- VI) Which of the following statements is true for a symmetric distribution?
(A) $(Q_3 - M) = (M - Q_1)$ (B) $(Q_3 + M) = (M + Q_1)$
(C) $(Q_2 - Q_3) = (Q_3 - Q_1)$ (D) $Q_3 + Q_1 > 2M$
- VII) Generally, what is the range of coefficient of skewness for data where the mode is ill-defined?
(A) 0 to 1 (B) -1 to +1 (C) -3 to +3 (D) -1 to 0
- VIII) Find the value of $nC_0 + nC_n$
(A) 0 (B) 1 (C) 2 (D) 2n
- IX) A parameter and statistic respectively are characteristics of which of the following?
(A) Population and Sample (B) Sample and Population
(C) Sample and Sample (D) Population and Population
- X) A sample selected from a population consists which of the following?

- (A) All units of the population (B) Only 50% of the units of the population
 (C) Only 15% of the units of the population (D) Some units of the population
- XI) If the first term of a G.P. is 'a' and the common ratio is 'b'. find (n+1)th term.
 (A) ab^n (B) ar^n (C) ab^{n-1} (D) ar^{n-1}
- XII) For a G.P. 0.2, 0.02, 0.002....., find the common ratio.
 (A) 10 (B) 0.2 (C) 2 (D) 0.1

Section – B

- 2. Answer the following I to XII questions in one sentence each. (Each carries 1 mark) [12]**
- I) Define sample
 II) State the methods of collecting primary data.
 III) State the condition under which geometric mean cannot be found.
 IV) Mean of variable x is 9. What is the mean of the variable $y = x + 4$?
 V) Which is the best measure of dispersion?
 VI) State the type of skewness for a frequency distribution whose three quartiles are 21, 18 and 20.
 VII) If $nC_3 = 20$ then find the value of n .
 VIII) What is meant by population inquiry?
 IX) Define heterogeneous population.
 X) Define many – one function in notation.
 XI) Find the sum of first 15th term of the G.P. 5,5,5, ...
 XII) If $\bar{X} = M = M_0$ then write type of skewness.

Section – C

Answer any 8 out of 12 questions from the following questions as directed. (Each carries 2 marks) [16]

3. State any two uses of tabulation.
4. State the guiding rules for the construction of a table.
5. The median of the observations $a - 5, a + 1, a + 2, a - 3, a$ is 10. Find a
6. What are the factors to be considered while choosing an appropriate average?
7. Find standard deviation for the observation 1, 2, 3, 4, 5.
8. Find coefficient of quartile deviation for the observations: 8, 15, 2, 11, 20, 3, 5.
9. If a frequency distribution has $Q_3 - Q_2 = 2(Q_2 - Q_1)$, then find j .
10. State any two characteristics of symmetric distribution.
11. How many 5 digits' number can be formed using all the digits 3, 8, 0, 7, 6?
12. In how many ways can all the letters of the word MANGO be arranged so that vowels are not together?
13. Give definition of a function.
14. If $f: R \rightarrow R$ and $f(x) = x^2 + 2x - 1$ then state the type of function f .

Section – D

Answer any 6 out of 9 questions from the following questions as directed. (Each carries 3 marks) [18]

15. There were 1400 students studying in a commerce college. Among them 855 were boys and of them, 225 boys were in the second year. In the second year, the number of boys and the number of girls are equal.

Among the 550 students of the first year, the proportion of number of boys and girls is 3 : 2. In the third year, number of boys is three times the number of girls. Represent the above information in a table.

16. There were 850 student studying in higher standards of a school. The number of students in standard 10, 11 and 12 were in the proportion 8 : 5 : 4. In standard 10, the number of boys is 30% of the number of students in the school. In standard 11, the number of boys and girls are equal. In standard 12, the number of boys is three times the number of girls. Present the above data in a tabular form.
17. Find D_7 and P_{15} from the following data about daily sales of a mobile phone shop.

No. of mobile phones	4	6	7	8	10	12
No. of days	3	9	15	23	8	2

18. The information of number of flowers on 100 plants of a nursery is given below. Find the quartile deviation of the number of flowers from it.

No. of flower	11	13	15	17	19	21	23	25
No. of plants	5	8	13	20	22	18	10	4

19. Third quartile is at a distance of 12.8 from the median in a frequency distribution and its first quartile is at a distance of 11.2 from the median. Find skewness and its coefficient.
20. For the function $f: A \rightarrow B, f(x) = 4x - 3, R_f = \{9, 13, 17, 25\}$ then find D_f .
21. If $k: R \rightarrow R, k(x) = x^2 + 3x - 12$ then determine type of the function k.
22. Find T_5 and S_4 of the geometric progression if the first term is $\frac{27}{16}$ and the common ration is $\frac{2}{3}$.
23. How many terms of a geometric progression 2, 4, 8, 16,would add to 126?

Section – E

Answer any 3 out of 5 questions from the following questions as directed. (Each carries 4 marks) [12]

24. The following information is available about defective staplers after testing 50 packets of 500 staplers each. Find coefficient of skewness using Karl Pearson's method.

No. of defective staplers	19	20	21	22	23	24	25	26
No. of packets	5	18	10	8	4	2	2	1

25. The frequency distribution of units of power consumed in an hour for different machines during a production process of factory is as follows. Find coefficient of skewness by Bowley's method.

Units of power consumed	10-15	15-20	20-25	25-30	30-35	35-40
No. of machines	5	10	15	20	25	30

26. There are 4 different books of Statistics and 3 different books of Economics on a table. In how many ways can 2 books be selected such that.

(1) both the books are of the same subjects?

(2) both the books are of different subjects?

27. In how many ways can 3 boys and 2 girls be arranged in a row such that

(1) both the girls remain together?

(2) boys and girls are alternately arranged?

28. 4 couples (husband – wife) attend a party. In how many ways can 2 persons be selected from these 8 persons such that

(1) two persons selected are husband and wife?

(2) one is male and the other is a female?

Section – F

Answer any 2 out of 3 questions from the following questions as directed. (Each carries 5 marks) [10]

29. The wheat crop grown per acre by farmers in different parts of a state is given below:

Wheat crop per acre (quintals)	20-25	25-30	30-40	40-50	50-60
No. of farmers	12	23	45	29	7

Find mean and median for the wheat crop per acre

30. The information of marks obtained by 220 students of a college is given below. Find the quartile deviation of the marks obtained by the students.

Marks	0-9	10-19	20-29	30-39	40-49	50 or more
No. of Students	30	50	64	42	29	5

31. The information of runs scored by a batsman in his 100 matches is given below. Find the standard deviation of runs scored by him from it.

Runs	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of matches	10	15	25	25	10	10	5