

HSC 12TH STANDARD
STATISTICS
MODEL QUESTION PAPER - 2

TIME: 2.30HOURS

MARKS: 70

I. Choose the right answer:-

15 × 1 = 15

1. An Integer is chosen from 1 to 20. Find the probability that it is divisible by 4
 - a) $\frac{1}{4}$
 - b) $\frac{1}{3}$
 - c) $\frac{1}{2}$
 - d) $\frac{1}{10}$
2. If F(x) is a distribution function then F(-∞) is
 - a) -1
 - b) 0
 - c) 1
 - d) -∞
3. In a normal distribution N(60,9) the Quartile deviation is _____
 - a) 60
 - b) 9
 - c) 3
 - d) 2
5. Large sample theory is applicable when
 - a) $n > 30$
 - b) $n < 30$
 - c) $n < 100$
 - d) $n < 1000$
6. The variance of the sampling distribution of the mean
 - a) σ^2
 - b) $\frac{\sigma}{n}$
 - c) $n \sigma^2$
 - d) $\frac{\sigma}{\sqrt{n}}$
7. The test for significance of the difference between two sample means, the population variances being equal but unknown
 - a) t- test
 - b) χ^2 - test
 - c) f - test
 - d) z - test

8. The greater the discrepancy between the observed and expected frequency _____ the value of λ^2
- a) Decreases
 - b) increases
 - c) Does not change
 - d) becomes zero
9. Equality of several normal population means can be tested by
- a) t- test
 - b) χ^2 - test
 - c) f - test
 - d) z - test
10. Simple average method is used to calculate
- a) Trend values
 - b) cyclic variations
 - c) Seasonal indices
 - d) none of these
11. Which of the following methods for measuring the trend is useful for estimation?
- a) graphical method
 - b) semi average method
 - c) moving average method
 - d) method of least square
12. Measures of association in usually deal with
13. If the attributes A and β is such that $(A\beta)=0$ then the relationship between them is
- a) Positive
 - b) negative
 - c) Independent
 - d) dependent
14. The criterion which selects the action for which maximum pay-off is lowest is known as
- a) max-mini criterion
 - b) min-max criterion
 - c) max-max criterion
 - d) none of these
15. Which of the following methods while selecting an action minimum and maximum pay-off are taken in account?
- a) maxi-min
 - b) maxi-max
 - c) mini-max
 - d) Hurwicz method

Part-2

Answer any of the six questions. Question No.20 is compulsory $6 \times 2 = 12$

16. Define conditional probability.
17. State the characteristic function for a discrete random variable
18. Give any two examples of Poisson distribution.
19. Define Null Hypothesis.
20. Write short note on Yate's correction.
21. In a two way analysis of variation consisting of 4 treatments and 5 varieties. Find the degrees of freedom of errors and of total number of elements.
22. The trend values obtained for the years 1990 and 1994 under the method of least squares are 50.2 and 52.2. find the equation of the trend line?
23. Verify whether the given data $N=60$, $(A)=51$, $(B)=32$, $(AB)=25$ are consistent.
24. Write the uses of decision tree.

25. Two cards are drawn at random from a pack of 52 cards. Find the probability that the cards drawn are a king and a queen?
26. A player throws a fair die. If a prime number occurs he wins that number of rupees but if a non-prime number occurs he loses that number of rupees. Find the expected gain of the player and conclude.
27. In a normal distribution, determine the limits of the central 50% of the area.
28. Write a short note on sampling distribution.
29. A car company decided to introduce a new car whose mean petrol consumption is claimed to be lower than that of the existing car. A sample of 50 new cars were taken and tested for petrol consumption. It was found that mean petrol consumption for the 50 cars was 30km per liter with a standard deviation of 3.5km per liter. Test at 5% level of significance whether the

company's claim that the new car petrol consumption is 28 km per liter on the average is acceptable.

30. A random sample of size 20 from a population gives the sample Standard Deviation of 12. Test the hypothesis that the population Standard Deviation is 9.
31. Draw a trend-line with the help of method semi-averages.

Year	1996	1997	1998	1999	2000	2001	2002
Release	600	800	1000	800	1200	1000	1400

32. Find whether A and B are Independent from the following data.
(AB)=256, (α B)=768, (A β)=48, (α β)=144
33. Explain 'Hurwicz criterion'.

Part-4

Answer all the questions:-

5×5=25

(a) Two cards are drawn at random from a pack of 52 cards. Find the probability that the cards drawn are (i) a diamond and a spade, (ii) a king and a queen and (iii) 2 aces.

(Or)

(b) In a continuous distribution whose probability density function is given by $f(x) = \frac{3}{4}x(2-x); 0 < x < 2$. Find the expected value of x and standard Deviation.

35. (a) X is normally distributed with Mean 12 and standard deviation 4. Find the probability of the following (i) $P_s(x > 20)$, (ii) $\{(x < 20)\}$, (iii) $P_{ss}(0 < x < 12)$.

(Or)

(b) Write a detailed note on one tailed and two tailed test.

36. (a) In a referendum submitted to the 'student body' at a university 850 men and 550 women voted. 530 of the men and 310 of the women voted 'yes'. Does this indicate a significant difference of the opinion on the matter between men and women students?

(Or)

(b) 1000 students at college level were graded according to their IQ and the economic conditions of their homes. Use χ^2 test to find out whether there is any association between economic condition at home and I.Q.

Economic Conditions	IQ		Total
	High	Low	
Rich	460	140	600
Poor	240	160	400
Total	700	300	1000

37. (a) Apply the technique of analysis of variance to the following data relating to yields of varieties of wheat in 3 blocks.

II	7	7	6
III	8	5	4
IV	5	4	4

(Or)

(b) Suppose that a decision maker faced with three decision alternatives and four states of nature. Given the following profit pay-off table.

Acts	States of Nature			
	S1	S2	S3	S4
A1	16	10	12	7
A2	13	12	9	9
A3	11	14	15	14

Assuming that he has no knowledge of the probabilities of occurrence of the states of nature. Find the decisions to be recommended under each of the following criteria.

(i) maximin (ii) maximax (iii) minimax regret.

38. (a) Calculate three yearly moving average of the following data.

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of Students	15	18	17	20	23	25	29	33	36	40

(Or)

(b) Can vaccination be regarded as a preventive measure of small pox from the data given below? of 1482 persons in a locality exposed to small pox 368 in all were attacked Among the 1482 persons 343 had been vaccinated, among those only 35 and were attacked.