HIGHER SECONDARY SECOND YEAR

STATISTICS

MODEL QUESTION PAPER - 1

TIME: 2.30HOURS **MARKS: 70**

Part-1

ANSWER ALL THE QUESTIONS:-

I. Choose the correct answer from the given alternatives:- 15 × 1 = 15

1. 'A book on games of Chance' written by a mathematician Jerane Cardon was published in the year

a) 1663 b) 1773

c) 1883 d) 1993

2. Var (4x+7)

a) 4 Var (x) b) 8 Var (x)

c) 16 Var (x) d) 11 Var (x)

3. For a discrete distribution function $F(x_j) - F(x_{j-1})$=

a) $P(x_{j-1})$ b) $P(x_j)$

c) 0 d) 1

4. The trials in a binomial distribution are

a) Mutually exclusive b) non-mutually exclusive

c) Independent
d) non-independent

5. In a normal distribution, skewness is

a) One
b) zero
c) greater than one
d) less than one

6. A hypothesis may be classified as

a) Simple
b) composite
c) Null
d) All the above

7. Standard error of number of success is given by

a) $\frac{\sqrt{pq}}{n}$
b) $\sqrt{npq}$
c) npq
d) $\frac{\sqrt{np}}{q}$

8. If $p = \frac{2}{3}$ 2/3 then $q =$

a) $\frac{2}{3}$
b) $\frac{3}{2}$
c) $\frac{1}{3}$
d) $\frac{3}{4}$

9. The mean of t-distribution is

a) 0
b) 1
c) $\bar{x}$
d) $\frac{s}{\sqrt{n}}$

10. Degrees of freedom for Chi-square test in case of contingency table of order 4×3 are

a) 12
b) 9
c) 8
d) 6

11. In the case of one-way classification, the total variation can be split into

a) Two components b) three components

c) four components d) only one components

12. Business forecasts are made on the basis of

a) Present data b) past data

c) Policies and circumstances d) all the above

13.The number of methods to measure the long term trend is

a) 1 b) 2

c) 3 d) 4

14. If (AB)= 25, (Aβ)= 26, $(\alpha) = 9$ then the total number of members in the data is

a) 60 b) 42

c) 34 d) 31

15. Maximin return, maximax return and minimax regret are criteria that

a) Lead to the same optimal decision

b) Cannot be used with probabilities

c) Both a and b

d) None of the above

Part-2

6×2=12

<u>Answer any of the six questions. Question No.23 is compulsory</u>

16. Find the probability of not getting a doublet while throwing two dice.

17. Evaluate:- $\lim_{n\to 1} \frac{n^2+n-2}{(n-1)}$

18 Find the coefficient skewness of the binomial distribution $\left(\frac{2}{3}+\frac{1}{3}\right)6$

19. Define standard Error.

20. Find the test statistics from the data n=400, p=0.3, P=0.375 while testing the significance

21. Define chi-square test.

22. Give the definition of Time series given by Mooris Han burg.

23. Discuss the association of attribution based on the value of Yule's coefficient - Q

24. What is a Pay-off Matrix?

Part-3

$6 \times 3 = 18$

Answer any of the six questions. Question No.30 is compulsory.

25. A whole number is selected from a set of numbers from 20 to 30. Find the probability of getting a prime number

26. Test whether $f(x) = \begin{cases} 5x^4 & 0 < x < 1 \\ 0 & \text{Otherwise} \end{cases}$ is a probability density function of a continuous random variable

27. If X is a poisson variable with Parameter 5, find the value of $E(x^2)$

28. A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased.

29. Give any three properties of chi-square distribution.

30. In an one way analysis of variance, test whether any difference is between treatments from the following data SST=10, SSE=18 and the respective degrees of freedom are 2 and 12.

31. Write a short note on cyclical variations

32. In a group of 400 students, the number of married is 160. Out of 120 students who failed 48 belonged to the married group. Find out whether the attributes of marriage and failure are Independent.

33. Calculate EMV and thus select the best act for the following pay-off table:

States of nature	Probability	Pay-off (Rupees) by the player		
		A	B	C
X	0.3	-2	-5	20

Y	0.4	20	-10	-5
Z	0.3	40	60	30

Part-4

5*5=25

Answer all the questions:-

34. (a) A manufacturing firm produces steel pipes in three plants with daily production volumes of 500, 1000 and 2000 units respectively. According to past experience, it is known that the fractions of defective out puts produced by the three plants are respectively, 0.005, 0.008 and 0.010. If a pipe is selected from days total production and found to be defective, what is the probability that it came from the (i) first plant, (ii) the second plant, (iii) the third plant?

(Or)

(b) Three cards drawn at random successively with replacement, from a well shuffled pack of 52 cards. Getting a card of diamond is termed as success. Find the mean and standard deviation of the distribution of the number of successes.

35. (a) The probability of the evening college student will be a graduate is 0.4. Determine the probability that out of 5 students (i) none, (ii) one, (iii) atleast one will be a graduate.

(Or)

(b) Describe in detail level of significance and critical value.

36. (a) Test the significance at 5% level of significance the samples from the following data

	Size of sample	**Mean**	**S.D**
Sample A	100	50	4
Sample B	150	51	5

(Or)

(b) Two random samples drawn from two normal populations are.

Sample I	20	16	26	27	22	33	18	24	19	25	-	-
Sample II	27	33	42	35	32	34	38	28	41	43	30	37

Obtain the estimates of the variance of the population and test at 5% level of significance whether the two populations have the same variance

37. (a) The following figures relate to production in kg of three varieties A,B and C of wheat shown in 12 plots.

A	20	18	19		
B	17	16	19	18	
C	20	21	20	19	18

Is there any significant difference in the production of the three varieties.

(Or)

(b) Explain in detail, classes, class frequencies and the relationship between the class frequencies in the study of association of attributes.

38. (a) Find the seasonal variations by simple average method for the data given below.

Quarters				
Year	I	II	III	IV
1989	30	40	36	34
1990	34	52	50	44
1991	40	58	54	48
1992	54	76	68	62
1993	80	92	86	82

(Or)

(b) A manufacturing company has to select one of the two products A or B for manufacturing. Product A requires investment of ` 20000 and product B of `40000 market research shows high, medium and low demand with the corresponding probabilities and returns from sales in `1000 for the 1000 products in the following table.

Market demand	**Probability**		**Return from tables**	
	A	**B**	**A**	**B**
High	0.4	0.3	50	80
Medium	0.3	0.5	30	60
Low	0.3	0.2	10	50

Constrict an appropriate decision tree. What decision the company should take?