QP CODE: 24019189

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Reg No : .....

Name : .....

**B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE EXAMINATIONS, MAY 2024**

**Second Semester**

B.Sc Statistics Model I

**Core Course - ST2CRT02 - BASICS IN PROBABILITY THEORY AND APPLIED STATISTICS-COURSE II**

2017 ADMISSION ONWARDS

587A6AFB

Time: 3 Hours Max. Marks : 80

.

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Define Sample space and Event.
2. What is frequency ratio?
3. Show that $P(A') = 1 - P(A)$ .
4. The probability that a boy will get scholarship is 0.9 and a girl will get is 0.8. What is the probability that at least one of them will get the scholarship?
5. If P (A) = 0.2, P (B) = 0.3 and A and B are independent. Find P (A/B) and P(B/A).
6. Examine the consistency of the statement
   $P(A) = 0.5, P(B) = 0.2, P(C) = 0.4, P(AB) = 0.1,$
   $, P(BC) = 0.2, P(AC) = 0.3, P(ABC) = 0.01, P(A'B'C') = 0.8$
7. If the price index for the year 2017 based on the price in 2010 is 125, then what it means ?
8. Why indices are called economic barometers?
9. Define wholesale price index number.
10. Define time series.
11. What is meant by random variation ?
12. Explain the graphic method to find trend.

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. For any two events A, B prove that $P[(A \cap B') \cup (A' \cap B)] = P(A) + P(B) - 2P(A \cap B)$.

14. One bag contains 4 white and 2 black balls. Another contains 3 white and 5 black balls. If one of the ball is drawn from each bag. Find the probability that (1) both are white (2) both are black (3) one is white and the other is black.

15. The probability for a male birth is 0.6. Find the probability that in four births (1)All are boys (2) Atleast one girl (3) Two boys and two girls.

16. An urn 'A' contains 2 white and 4 black balls. Another urn 'B' contains 5 white and 4 black balls. A ball is transferred from the urn 'A' to urn 'B'. Then a ball is drawn from urn B. Find the probability that it will be white.

17. State and prove multiplication theorem for two events and deduce it for three events.

18. What is meant by factor reversal test? Verify it for Fishers index number.

19. Distinguish between FBI and CBI.

20. Describe the merits and demerits of the methods of moving average to measure trend.

21. Explain the link relative method to measure the seasonal variation.

(6×5=30)

**Part C**

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. (a) The probability that a doctor will correctly diagnose a disease is 0.6. The probability that a patient will die by his treatment after correct diagnose is 0.4 and that of his death by wrong diagnosis is 0.7. A patient of the doctor who had this disease died. What is the probability that his disease was not correctly diagnosed?
(b) State the axioms of probability.

23. (a ) Explain Baye's theorem stating its applications.
(b) Two classes A and B consist of 25 boys, 15 girls, and 20 boys, 30 girls respectively. One student is selected at random and found to be a girl. Find the probability that the selection was from class B.

24. a) Define price index number. (b) What are the problems in the construction of index numbers?

25. What are the merits and demerits of semi average method ? How will you find trend using this method ?

(2×15=30)