CHRIST UNIVERSITY, BANGALORE-560029
I B.Sc End Semester Examination October 2010

Code: STA131   **Max. Marks: 100**

Sub:Basic Statistics & Probability   **Duration: 3 Hrs**

SECTION - A

Answer any 10 questions.   **10 x 2 = 20**

1. Define statistics
2. List any two sources of secondary data.
3. Distinguish between discrete and continuous variables
4. Distinguish between dichotomy and bifold classification.
5. Name the two positional averages.
6. Define mean deviation about an arbitrary value A
7. Find the probability of getting an even number when a fair die is thrown once.
8. Give an example of a discrete random variable.
9. Define distribution function of a continuous random variable.
10. State addition theorem of expectation.
11. If $E(X) = 8$, find $E(8X)$, $E(9X+6)$.
12. If $V(X) = 5$, find $V(4X)$, $V(2X+8)$.

SECTION - B

Answer any 4 questions.   **4 x 6 = 24**

13.   The daily high and low temperatures for 20 cities follow:

City	High	Low	City	High	Low
Athens	75	54	Melbourne	66	50
Bangkok	92	74	Montreal	64	52
Cairo	84	57	Paris	77	55
Copenhagen	64	39	Rio de Janeiro	80	61
Dublin	64	46	Rome	81	54
Havana	86	68	Seoul	64	50
Hong Kong	81	72	Singapore	90	75
Johannesburg	61	50	Sydney	68	55
London	73	48	Tokyo	79	59
Manila	93	75	Vancouver	57	43

(a) Prepare a stem and leaf display for the high temperatures and low temperatures. (b) Compare the stem and leaf displays from part (a) and make some comments about the difference daily high and low temperatures.

14. List the merits and demerits of geometric mean

15. Write short notes on Lorenz curve.

16. Define pairwise and mutually independent events. How many conditions are present for mutual independence independence of n events.

17. If X is a random variable and a is a constant, prove that $E(aX+b) = a E(X)+b$ if i. X is discrete   ii. X is continuous

18. Write the formula for moment generating function r about origin when X is

<p style="text-align:center">i) discrete
ii) continuous</p>

SECTION - C

Answer any 4 questions.   **4 x 14 = 56**

19. a.   Explain different methods of primary data collection
     b.   Describe the construction of a pie chart, giving suitable example

20. a.   Distinguish between absolute and relative measures of dispersion. Discuss various measures of absolute and relative measures of dispersion.
     b.   Let r be the range and s be the standard deviation of a set of n observations. Then prove that s≤r.

21. a.   Prove that for any discrete distribution standard deviation is not less than mean deviation from mean.
     b.   Express raw moments in terms of central moments

22. a) Prove that $P(A^c \cap B) = P(B) - P(A \cap B)$
<p style="text-align:center">$P(A \cap B^c) = P(A) - P(A \cap B)$</p>
     b) Define mutually exclusive events. State and prove addition theorem for mutually exclusive events.

23. a) If A and B are independent, prove that A^c and B are independent.
     b) A box has 8 red, 5 green and 10 blue balls. Two are drawn one after another . What is the probability that they are both green in case of
          (i) drawn together
          (ii) drawn one after another with replacement
          (iii) drawn one after another without replacement

24. Prove that $V(aX) = a. V(X)$, $V(a) = 0$ and $V(aX+b) = a. V(X)$ for any discrete variable. If X is a discrete random variable taking values -20, -10 and 10 with equal probabilities, find V(50), V(6X) and V(3X+60) and V(80X).