TRIBHUVAN UNIVERSITY
FACULTY OF MANAGEMENT
Office of the Dean
2014

Full Marks: 60
Time: 3 hrs.

BIM/ Third Semester/STT 201: Statistics

Candidates are required to answer the questions in their own words as far as practicable

Group "A"

Brief Answer Question: *[5 X 2=10]*

1. The Standard deviation of a symmetrical distribution is 3. What must be the value of the fourth moment about the mean in order that the distribution is mesokurtic?
2. In a moderately skewed distribution, if arithmetic mean is 24.6 and mode is 26.1, find the value of median.
3. A student calculated the value of r = 0.8 from 10 observations and concluded that r is highly significant. Is his conclusion correct?
4. A frequency distribution gives the following results: C.V = 50%, $\sigma = 2$, $s_k = 0.5$. find the value of mean and mode.
5. For 5 pairs (x,y) of observations of the variables x and y the results were obtained: $\sum x = 15$, $\sum y = 25$, $\sum x^2 = 55$, $\sum y^2 = 135$ and $\sum xy = 83$, Find the appropriate regression equation to estimate the value of y when x=83, find the appropriate regression equation to estimate the value of y when x=8.

Group "B"

Short Answer Question: *[6 X 5 =30]*

6. A company has decided to pay bonus to employee according to the monthly pay scales as follows:

Monthly salary (in Rs)	Bonus (in Rs)
1000-1200	500
1200-1400	600
1400-1600	700
1600-1800	800
1800-2000	900
2000-2200	1000

The actual salaries of the employees are given as follows:
2000,1800,1850,1950,2180,1870,1600,1500,1980,1900,1680,1700,1780,1750,1400,1250,1460, 1600,1550,1450,1250,1150,1620,1300,1500
What is the average bonus paid per employee?

7. Mean score of 100 items was 40 and the standard deviation 10. It was later discovered that two items were wrongly read as 30 and 70 instead of 3 and 27. Find the correct mean and standard deviation.
8. Find first four central moments from the data given below. Also calculate β_1 and β_2 and comment about the distribution.

Class:	10-20	20-30	30-40	40-50	50-60
Frequency:	5	10	14	9	6

9. Assuming that a factory has two machines. Past records showed that machine 1 produce 30 percent of the items of output and machine 2 produces 70 percent of the items. Further, 5 percent of the items produced by machine 1 were defective and only 1 percent of the items produce by machine 2 were defective. if a defective item is drawn at random, what is the probability that it was produced by machine 1 ?

10. Fit a straight line trend using the principal of least square for the following data.

Year	2000	2001	2002	2003	2004	2005	2006
Profit (in '000 Rs)	7	10	12	14	17	16	19

Find the trend values by using the linear equation. Also estimate the profit in 2007 and monthly profit.

11. In calculating the cost of living index number the following weights were used: Food 15, clothing 3, rent 4, fuel and light 2, miscellaneous 1. Calculate the index for a data when the average percentage increases in price of items in the various groups over the base period were 32,54,47,78 and 57 respectively.
Suppose a person was earning Rs 2050 in the base year, what should be his salary in the current period if his standard of living is to maintain as in the base year?

Group "C"

Comprehensive Answer Question: *[2 X 10=20]*

12. A whole-seller obtained samples of electric bulbs from suppliers. He got samples tested in the laboratory for the length of life. The following results of the test are obtained.

Length of life(in hrs)	600-800	800-1000	1000-1200	1200-1400	1400-1600
Supplier A	20	30	28	34	20
Supplier B	6	44	40	24	6

a. Which supplier's bulbs show greater variability in the length of the life?
b. If the risk is associated with the greater variability, advice to whole-seller about which supplier's bulbs to be bought?

13. Family income and percentage spent on food of hundred families gave the following bivariate frequency distribution.

Food Expenditure (in %)	Family income (in Rs)					Total
	200-300	300-400	400-500	500-600	600-700	
10-15	-	-	-	3	7	10
15-20	-	4	9	4	3	20
20-25	7	6	12	5	-	30
25-30	3	10	19	8	-	40
Total	10	20	40	20	10	100

Find the regression equation to estimate the percentage expenditure on food of a family whose income is Rs 750.