POKHARA UNIVERSITY

Level: Bachelor Semester –Spring Year : 2014
Programme: BCA Full Marks: 100
Course: Fundamentals of Probability and Statistics Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) The stem-and-leaf display represents the bounced check fee for a sample of 25 banks for direct deposit customers. 5

Stem	leaves
1	5 5 8 8
2	0 0 0 0 1 2 2 5 5 5 5 8 8 9
3	4 5 6 7 7
4	1 2

i. What are the two information obtained from this stem and leaf display?
ii. What percentages of items are before 30?
iii. Construct the relative percentage frequency distribution.

b) A Tele film production company of Nepal Television is selecting a group of artist. The ages (in years) of 20 persons who were interviewed are: 5

50, 56, 55, 49, 52, 57, 56, 57, 56, 59, 54, 55, 61, 60, 51, 59, 62, 52, 54, 49

The director of the telefilms wants artists whose average ages are not more than 55 years with standard deviation of at most 3 years. Does this group qualify the requirement of the director?

c) The weights of the players of Baltimore Bullets professional football team have a mean of 224 pounds with a standard deviation of 18 pounds, while the mean and standard deviation of weight of their Sunday Opponent the Chicago Trailblazers is 195 and 12, respectively. Which team exhibits the grater relative dispersion in 5

weights?

2. a) The table given below represents the daily wage distribution of 130 workers. Find out the range of income of the middle 60% workers. 7

Wages (Rs per weeks) more than	70	85	100	11	130	14	160	175
No. of workers	130	12	109	79	44	26	14	5

i. Find the minimum income of top 35% workers.
ii. Find the maximum income of initial 25% workers.

b) The weights (in grams) of 10 oranges picked at random from a basket are as follows: 8

45, 55, 30, 75, 40, 60, 65, 70, 85, 80

i. List the five number summary
ii. Form the box and whisker plot and describe the shape.

3. a) A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that 5

i. Only one of them will be selected?
ii. None of them will be selected? 5

b) A manufacturing firm produces steel pipes in three plants with daily production volumes 500, 1000 and 2000 units respectively. According to past experience, it is known that the fraction of defective output produced by the three plants are respectively 0.005, 0.008 and 0.010, if a pipe is selected from a day's total production

i. What is probability that it is defective?
ii. If defective pipe is found, what is probability that it is come from plant 1?

c) In a certain university of Nepal 80% of the students is Hindu and remaining non Hindu. If 20% of the Hindu students are smokers while 25% of the non-Hindu are smokers. What is the probability that a randomly selected smoker student is a non-Hindu? 5

4. a) The number of hardware failures of a computer in a week of operation has the following probability mass function 5

Number of families :	0	1	2	3	4	5	6
Probability :	0.18	0.28	K	0.18	0.06	2K	0.01

i. Find the value of 'K'.
ii. Find the expected number of families in a week.
iii. Find the variances of the number of failures in a week.

b) Past history shows that 60% of college students in any college of IT prefer Linux operating system in their PC and rest prefer Window. A sample of 5 students from a college is selected. What is the probability that 5
i. Less than 2 students prefer Window operating system in their PC**?**
ii. More than 3 prefer Linux?

c) In average there are 2 suicides in ktm per week. Find the probability of 5
i. At least 5 suicides in a month
ii. Exactly 8 suicides in a month

5. a) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and S.D. of the distribution. 7

b) Madhu, a frugal student, wants to buy a used bike. After randomly selecting 125 wanted advertisements, he found the average price of the bike to be Rs. 3250 with a standard deviation of Rs. 615. Establish an interval estimate for the average price of bike so that Madhu can be: 68.3% certain that the population mean lies in this interval. 4

c) A random sample of 500 apples was taken from a large consignment and 60 were found to be damaged. Construct 96% confidence interval for the good apples in the population. 4

6. a) The manufacturer of Shilpa electric bulbs claims that mean life of their bulb is 25 months. A random sample of 9 such bulbs gave the following values. 5

Life in months : 24, 26, 32, 28, 20, 20, 23, 27, and 34

Can you regard the manufacturer's claim to be valid at 5% level of significance?

b) A ketchup manufacturer is in the process of deciding whether to 5

produce a new extra spicy brand of ketchup, the company will produce the new spicy brand if its current brand is superior to its competitor. In a survey of 6000 households, the company's market research team found that, 3550 households would like their brand. At 2% level of significance, should the company conclude to produce a new extra spicy brand of ketchup? Use p-value approach to come in conclusion.

c) The following table gives the ages (years) of husbands and wives at the time of their marriage. 5

Age of husbands(x)	23	27	28	28	28	30	30	33	35	38
Age of wives(y)	18	20	22	27	21	29	27	29	28	29

Find the correlation coefficient between x and y.

7. Write short notes on **any two**: 2×5

a) Quantitative and categorical variables with at least one example of each

b) Type I and type II error

c) Coefficient of determination