POKHARA UNIVERSITY

Level: Bachelor Semester: Spring Year: 2021
Programme: BBA/BI/TT/BCIS Full Marks: 100
Course: Business Statistics Pass Marks: 45
Time: 3 hrs.

Candidates are required to answer in their own words as far as practicable. The figures in the margin indicate full marks.

Section "A"

Very Short Answer Questions

Attempt all the questions. [10×2]

1. Differentiate between descriptive statistics and inferential statistics.
2. Write the importance of statistics in business research.
3. Construct a stem and leaf display for the following data:

70	72	75	64	58	83	80
76	75	68	65	57	78	85

4. Calculate range and coefficient of range of the following data set. 2, 3, 5, 7, 12, 8, 10, 13, 20, 16 and 15.
5. The mean and median a distribution is 81 and 65 respectively. Is the distribution skewed? If yes, what type of skewness is it?
6. Define mutually exclusive and independent events.
7. Mean and variance of Binomial Distribution are 6 and 4 respectively. Find n, p and q.
8. A random sample of 64 light bulbs is drawn from a population having size 540 and standard deviation 120 hours. The sample mean of these 64 lights bulbs is found to be 1500 hours. Estimate a standard error of sample mean.
9. Define type I and Type II errors in hypothesis testing.
10. What are the qualities of a good estimator?

Section "B"

Descriptive Answer Questions

Attempt **any six** questions. [6×10]

11. a) Define primary and secondary data. Differentiate between them.
    b) Following is the percentage distribution of four religions in Pokhara and Kathmandu.

Religion	% distribution in	
	Pokhara	Kathmandu
Hindus	80	90
Buddhist	16	8
Christians	-	2
Muslims	4	-
Total	100	100

Compute IQV for Pokhara and Kathmandu and interpret the result.

12 BMT manufactures performance equipment for cars used in various types of racing. It has gathered the following information on the number of models of engines in different size categories used in the racing market it serves:

Engine size in cubic inches	Frequency (of models)
100-150	1
150-200	7
200-250	7
250-300	8
300-350	17
350-400	16
400-450	15
450-500	7

Construct a cumulative relative frequency distribution that will help answer these questions:

a) Seventy percent of the engine models available are larger than about what size?

b) What was the approximate middle value in the original data set?

c) If BMT has designed a fuel injection system that can be used on racing engines up to 400 cubic inches about what percentage of the engine models available will not be able to use BMT 's systems?

13. a) The following table summarize the employee's income according to their gender of a certain company.

Gender	Income		
	Less than 10,000	10,000 to 20,000	More than 20,000
Male	12	15	8
Female	11	18	3

i. Find the probability that a randomly selected employee is a less than 10000 earner?

ii. If a randomly selected employee is a male, what is the probability that he is a more than 20000 earner?

iii. Find the probability that a randomly selected employee is a female or an employee having income in between 10000 to 20000?

b) In a bank there is a vacancy for a manager post. Three candidates Mr. A, Mr. B and Mr. C applied for the post. There is a chance that Mr. A, Mr. B and Mr. C will be selected is 30%, 35% and 35% respectively. If Mr. A will be a manager, he will launch a new program is 4%. Similarly, Mr. B and Mr. C will launch is 10% and 15% respectively. If a new program is launched, what is the probability that the program is launched by Mr. B?

14. a) In a business venture a man can make a profit of Rs. 50,000 or incur loss of Rs. 20,000. The probability of making profit or incurring loss from the past experience is known to be 0.75 and 0.25 respectively. What is his expected profit and coefficient of variation?

b) Find the mean and standard deviation of a normal distribution of mark in

an examination where 44% of the students obtained marks below 55 and 6% obtained above 80 marks.

15. a) The number of calls arriving at an exchange during any given minute between noon and 1.00 pm. on a weekday is a random variable X with the following probability distribution:

Number of calls(X)	0	1	2	3	4	5
P(X)	0.3	0.2	0.2	0.1	0.1	0.1

Find the probability that between 12:34 and 12:35 Pm. more than two calls will arrive at the exchange. Also find the mean and standard deviation of the random variable.

b) Forty five percent of the Nepalese workers have been gone abroad are illegal. If in a sample of six, Nepalese workers who have gone abroad, what is the probability that:

i. two are illegal
ii. all are legal
iii. at least one is legal.

16. a) A sample of 600 persons selected randomly from a large city gives the result that males are 53%. Is there reason to doubt the hypothesis that males and females are in equal number in the city?

b) Eight sales executive trainees are assigned selling jobs right after their recruitment. After a fortnight they are withdrawn from their field duties and given a month's training for executive sales. Sales executed by them in thousands of rupees before and after the training, in the same period are listed below:

Sales before training	23	20	19	21	18	20	18	17
Sales after training	25	25	24	24	22	23	25	21

Do these data indicate that the training has contributed to their performance?

17. a) Dr. D.B. noted economist, surveyed 150 households in a particular place and found that 63 of them were unable to bear the school fee of their children. Set up 95% confidence interval estimate for the true proportion of households who cannot actually bear the school fee of their children.

b) The mean height of 50 students who showed participation in the athletics was 68.2 inches while standard deviation of 2.5 inches, while 50 students who showed no interest in such participation had a mean height of 67.5 inches with standard deviation of 2.8 inches. Test the hypothesis that students who participate in athletics are taller than other students.

Section "C"

Case Analysis

18. *Read the case situation given below and answer the questions that follow:* [20]

a) The following data represent the bounced check fee (in dollars) for a sample of 23 banks for direct-deposit customers who maintain a $100 balance and the monthly service fee (in dollars) for direct-deposit

customers if their accounts fall below the minimum required balance of $1500 for a sample of 26 banks.

Bounced Check Fee									
26	28	20	20	21	22	25	25	18	25
15	20	18	20	25	25	22	30	30	30
15	20	29							
Monthly Service Fee									
12	8	5	5	6	10	10	9	7	10
7	7	5	0	10	6	9	12	0	5
10	8	5	5	9	6				

i. List the five number summary of the bounced check fee and of the monthly service fee.

ii. Construct the box-and-whisker plot of the bounced check fee and the monthly service fee.

iii. What similarities and differences are there in the distributions for the bounced check fee and the monthly service?

b) Banks are permitted to sell a form of life insurance called savings bank life insurance (SBLI). The approval process consists of underwriting, which include a review of the application, a medical information bureau check, possible request for additional medical and medical exams and a policy compilation stage during which the policy pages are generated and sent to the bank for delivery. The ability to deliver approved policies to customers in a timely manner is critical to the profitability of this service to the bank, during a period of one month, a random sample of 27 approved policies was selected, and the following total processing times in days were recorded, the data are

73	19	16	64	28	28	31	90	60	56
31	56	22	18	45	48	17	17	17	91
92	63	50	51	69	16	17			

Where $\sum X=1185$, $\sum X^2=68629$.

i. Construct 95% confidence interval of population mean waiting time.

ii. Is it reasonable to conclude that average waiting time is less than 45 days?