KATHMANDU UNIVERSITY
End Semester Examination
January, 2025

Marks Scored:

Level : B.Pharm
Year : I

Course : MATH 102
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : 25 Jan 2025

SECTION "A"
[10Q. × 1 = 10 marks]

Fill in the blank space(s) by writing the most appropriate word(s) or symbol(s).

1. The graphical representation of cumulative frequency and class intervals is known as _____.
2. The quartiles divides the whole data into _____ equal parts.
3. During the measure of kurtosis, if b2>3 then the curve is _____.
4. If the value of P (A/B) and P (B) are 0.04 and 0.28 respectively, then P (AB) is _____.
5. In probability distribution, the variance for constant is always _____.
6. The X ~B (n. p) then the mean of the distribution is _____.
7. The parameter for the _____ distribution is $\mu$ and $\sigma 2$.
8. If n/N=0.03 then finite population multiplier is _____, for the calculation of Standard Error of Estimate (S.E).
9. In any case, if population standard deviation is clearly mentioned then _____ test is followed.
10. The process of determining the unknown values of 'y' using known value of 'x' is known as _____.

## SECTION "B"

[10 Q.× 1 = 10 marks]

Fill in the blank space(s), **DO NOT TICK**, by selecting the most appropriate answers from among the given ones.

11. The line drawn by joining the midpoint of each bar of histogram is :
[ Frequency curve — Cumulative frequency curve.
Scatter plot — None of the above.]

12. If Mean> Median> Mode then data is:
[ Symmetrical — Right skewed — Left skewed — All of the above.]

13. If events A and B are independent to each other. Then conditional probability, P (A/B) can be written as:
[ $\frac{P(AB)}{P(B)}$ — P (B) — P (A) — P (AB)]

14. Which of the following distribution has same mean and variance?
[ Binomial distribution — Poisson distribution
Normal distribution — None of the above]

15. If the values for x, $\mu$ and $\sigma$ are 13, 15 and 3.5 respectively then the value for standard normal variable (z) is :
[ -0.87 — -0.57 — -0.22 — 0.15]

16. If the size of sample decreases then width of confidence interval:
[ Increases — Decreases — Constant — None of the above]

17. "Rejecting null hypothesis when it is true." is known as:
[ Type I error. — Type II error — Power of test — None of the above]

18. If nothing is mentioned about the level of significance in hypothesis testing, then it should be:
[ 10% — 6% — 5% — 1%]

19. If r=0.656 then the relationship between two variables 'x' and 'y' is:
[ Perfectly positive — Highly positive — Highly negative — None of the above]

20. In a regression equation, y=3.2+0.2x, if the value of 'x' is 6 then 'y' will be:
[ 2 — 3.2 — 6 — None of the above.]

KATHMANDU UNIVERSITY
End Semester Examination
January, 2025

Level : B.Pharm
Year : I
Time : 2 hrs. 30mins.

24 Jan 2025

Course : MATH 102
Semester : II
F. M. : 55

SECTION "C"
[3Q × 7 = 21 marks]

1. A survey to learn how much time science students use social sites such as facebook, tiktok, twitters, instagram etc. On the questions asked, "How many hours do you surf Social Sites in a week?" A survey on forty eight students revealed the following data:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 58 | 13 | 63 | 22 | 63 | 59 | 87 | 86 | 77 | 56 | 44 | 32 |
| 60 | 69 | 94 | 66 | 81 | 38 | 43 | 103 | 64 | 28 | 54 | 58 |
| 52 | 30 | 49 | 50 | 52 | 96 | 16 | 26 | 44 | 48 | 68 | 70 |
| 18 | 36 | 48 | 40 | 48 | 54 | 55 | 59 | 69 | 62 | 91 | 37 |

a. Form stem and leaf display of the given data set and interpret the result.
b. Construct a grouped frequency distribution having seven classes of equal width starting from the smallest value to the given data above.
c. Draw a histogram from the data and construct frequency curve.

2. Notwithstanding the Equal Pay Act of 1963, in 1993 it still appeared that men earned more than women in similar jobs. A random sample of 38 male machine tool operators found a mean hourly wage of \$11.38, and the sample standard deviation was \$1.84. A random sample of 45 female machine-tool operators found their mean wage to be \$8.42, and the sample standard deviation was \$1.31. On the basis of these samples,
a. Set the null hypothesis and alternative hypothesis for male and female tool operators.
b. At $\alpha = 0.05$ that the male operators are earn more per hour than the female operators?
c. Calculate the *p-value* while testing the hypothesis in the above problem and give your decision.

3. An instructor is interested in finding out how the number of students absent on a given day is related to the mean temperature that day. A random sample of 10 days was used for the study. The following data indicate the number of students absent (ABS) and the mean temperature (TEMP) for each day.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ABS (y) : | 8 | 7 | 5 | 4 | 2 | 3 | 5 | 6 | 8 | 9 |
| TEMP (x): | 10 | 20 | 25 | 30 | 40 | 45 | 50 | 55 | 59 | 60 |

a. Plot the data and interpret its meaning and also find the correlation coefficient.
b. Fit the simple regression model for number of students absent (ABS).
c. Find the values of coefficient of determination & standard error of estimate and interpret their meanings.

**P.T.O.**

## SECTION "D"

[6Q × 4 = 24 marks]

4. Scores of two golfers for 10 rounds were as follows:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Golfer A | 74 | 75 | 78 | 78 | 72 | 77 | 79 | 78 | 81 | 76 |
| Golfer B | 86 | 84 | 80 | 88 | 89 | 85 | 86 | 82 | 82 | 79 |

Find which golfer may be considered to be more consistent player.

5. In a certain factory, machines I, II, and III are all producing springs of the same length. Of their production, machines I, II, and III produce 3%, 1%, and 2% defective springs respectively. Of the total production of springs in the factory, machine I produce 30%, machine II produces 20%, and machine III produces 50%.If one spring is selected at random from the total springs produced in a day, find the probability that it is defective and also find the posterior probabilities.

6. On the average, 4 customers per minute at any one of the checkout counters of a grocery store. What is the probability that there will be exactly 2 customers in a minute? Also find out probability that there will be at least 3 customers arriving at a checkout counter in the next two minute?

7. The weekly wages of workmen are normally distributed around a mean of Rs 75 with a standard deviation of Rs 10. Find the probability of workers when weekly wages will be between Rs 65 and 80. Also find the limit for middle 70 % workers.

8. A sample of 60 households drawn from a city area containing 14845 total households. It was known that the average household size is 3.4 and standard deviation is 1.22. Estimate the total city population at 97% confidence level. If the confidence level is further increased then what happen to the width of confidence interval? Explain.

9. The manufacturer of Shilpa pharmacy claims that have a mean life of the injection is 25 months. A random sample of 9 such injection gave the following values:
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?

## SECTION "E"

[5Q × 2 = 10 marks]

10. Find the mode from the data below:

| Sales (000) | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|
| No. of pharmaceutical company | 6 | 11 | 19 | 15 |

11. The following table contains the probability distribution of the number of traffic accidents daily in a small city. Find the expected number of accidents per day.

| Accidents daily(X): | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| P(X): | 0.10 | 0.20 | 0.45 | 0.15 | 0.05 | 0.05 |