

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

SWL-24

Q.1	Questions	A	B	C	D
1.	In normal distribution $\mu = 20$, $\sigma^2 = 64$ then the first mean moment is:	3	4	0	2
2.	The shape of the normal distribution is:	Leptokurtic	Mesokurtic	Platykurtic	Skewed
3.	In standardized normal distribution, its mean is:	0	3	μ	σ
4.	In sampling with replacement, a sampling unit can be selected:	Only once	Less than one	More than once	None
5.	Another name of probability sampling is:	Non probability sampling	Judgment sampling	Purposive sampling	Random sampling
6.	The finite population correction factor is:	$\frac{n}{N}$	$\frac{N-n}{N-1}$	$\frac{N}{n}$	$\sqrt{\frac{N-n}{N-1}}$
7.	A statistic $\hat{\theta}$ is said to be unbiased estimator of θ , if:	$E(\hat{\theta}) = \theta$	$E(\hat{\theta}) > \theta$	$E(\hat{\theta}) \neq \theta$	$E(\hat{\theta}) < \theta$
8.	In point estimation we get:	More than one value	Value in interval	Similar values	Single value

(Continued PTN)

Questions	A	B	C	D
9. In applying t-test:	n is large	σ is known	σ is unknown	None of these
10. The best fitted trend is one in which sum of squares of error is:	Maximum	Minimum	0	3
11. If $Y = 2 + 0.8x$, then slope of line is:	0.8	2	0.4	1.6
12. If $r_{xy} = 0$, then X and Y are:	Zero	Associated	Dependent	Independent
13. For $r \times c$ contingency table, the chi-square test has d.f:	$(r-1) + (c-1)$	$(r-1) - (c-1)$	$(r-1)(c-1)$	$(r-1)(c-2)$
14. The two attributes are independent if:	$Q = -1$	$Q = 1$	$Q = 2$	$Q = 0$
15. Graph of time series is called:	Histogram	Historigram	Trend	Straight line
16. In moving average method, we cannot find trend values of some:	Starting and end period	End period	Middle period	Starting period
17. Joystick is an example of:	Input device	Output device	Storage device	Processing device

Note :- Section B is compulsory. Attempt any THREE Questions from Section C.

SECTION - B

2. Write short answers to any EIGHT parts. (8 x 2 = 16)
- What is p.d.f of normal distribution?
 - Define the Normal Curve.
 - Discuss the role of " σ " in normal distribution.
 - If $X \sim N(15, 4)$, find the value of Z if $X = 18$
 - If $X \sim N(24, 16)$, find Q_1
 - Define the term Estimate.
3. Write short answers to any EIGHT parts. (8 x 2 = 16)
- Differentiate between sampling and non sampling errors.
 - What is meant by target population?
 - Define Sampling Frame.
 - Find $\sigma_{\bar{X}}^2$, given that $n = 4$, $\mu = 5$ and $\delta = 1.5$
if sampling is done with replacement.
 - Define Sampling Distribution.
 - If sampling is done without replacement and given that
 $N = 5$, $n = 2$, $P = \frac{2}{5}$, find σ_p^2
4. Write short answers to any SIX parts. (6 x 2 = 12)
- Define Multinomial Population.
 - Describe Spearman's co-efficient of rank correlation.
 - Determine the nature of association between A and B if
 $(A) = 415$, $(\alpha) = 285$, $(AB) = 147$, $(\alpha\beta) = 170$
 - Write a short note on time series.
 - Distinguish between histogram and historiogram.
- If $a=5\%$ then what will be the confidence level?
 - Explain the term null hypothesis.
 - Discuss the simple hypothesis.
 - Given that $n=10$, $\bar{X}=90$, $\sigma=4$ and $\mu=80$, find Z
 - What is computer?
 - Explain the term software.
 - Define Dependent Variable in Regression.
 - In a regression line, $\hat{X} = a + by$, $\sum X = 215$, find $\sum \hat{X}$
 - Give any two properties of regression co-efficient.
 - Find r given that $b_{yx} = 1.2$ and $b_{xy} = 0.6$
 - Define the term "Correlation Co-Efficient."
 - If $\bar{X}=50$, $\bar{Y}=110$, $a=10$, find value of regression coefficient.
 - State the name of four phases of cyclical variations in time series
 - What is method of least squares?
 - Fit a straight-line if $\sum Y = 300$, $\sum X = 0$, $\sum X^2 = 28$, $\sum XY = 14$
for years from 2000 to 2009.
 - Define Secular Trend.

SECTION - C Attempt any THREE Questions. Each question carries (4+4=8) marks.

(8x3=24)

5. (a) If a die is rolled 120 times, find the probability that even number appears:
(i) More than 70 times (ii) Less than 80 times
- (b) In normal distribution if $\mu = 100$ and $\sigma = 5$, find P_{63} and D_4
6. (a) Take all possible samples of size 3 from a population comprising the numbers 2 & 6. Verify that:
(i) $\mu_{\bar{X}} = \mu$ (ii) $\sigma^2 = n\sigma_X^2$
- (b) Take all possible samples of size 2 with replacement from the letters B,A,O. Considering proportions of vowels, verify that:
(i) $\mu_p = \pi$ (ii) $\sigma_p^2 = \frac{\pi(1-\pi)}{n}$
7. (a) A random sample of 200 persons from a city was interviewed and 50 of them were found to be literate. Calculate a 90% confidence interval for the proportion of literate persons in the city.
- (b) Suppose you wish to estimate the effects of a certain sleeping pill on men and women. Two samples are independently taken and the relevant data are shown as given:

	Men	Women
Sample size	$n_1 = 36$	$n_2 = 64$
Sample mean	$\bar{X}_1 = 8.75$	$\bar{X}_2 = 7.25$
Population variance	$\sigma_1^2 = 9$	$\sigma_2^2 = 4$

Test the null hypothesis $H_0 : \mu_1 = \mu_2$ at $\alpha = 0.05$

8. (a) Compute the regression line Y on X for this data:
 $n = 24$, $\sum X = 5402$, $\sum Y = 4378$, $\sum X^2 = 1388656$, $\sum Y^2 = 911032$, $\sum XY = 1118516$

- (b) Calculate correlation co-efficient for the following data:

X	4	8	12	16	20	24
Y	5	10	15	20	25	30

9. (a) Find χ^2 and test whether the attributes are independent at $\alpha = 0.05$

	A_1	A_2	A_3
B_1	215	325	60
B_2	135	175	90

- (b) Calculate two years centred moving average from the following time series:

Years	1920	1921	1922	1923	1924	1925
Y	800	840	882	900	910	950