UNIVERSITY OF EDUCATION
"UExam" Semester-IV, 2019
BS Chemistry Session:2017-21
Course Code: STAT2111
Subject: Introduction TO Statistics and Probability

SECTION: I (MCQ's)

Time Allowed: 20 Minutes   Max. Marks: 18

NOTE: Encircle the correct/ best answer in each of the followings. Each Question carries 1 mark. Use of remover carries zero mark. Cutting and Overwriting is not allowed.

Q1.

- The sum of all deviations about mean is _____
  (a) 0   (b) 1   (c) negative   (d) all of these.

- The median of the values 6, 3, 5, 1, 11, 10 is _____
  (a) 3   (b) 5   (c) 5.5   (d) 7.5

- The range of the data 8, 3, 7, 2, 0, 10 is _____
  (a) 0   (b) 2   (c) 8   (d) 10

- _____is called Ogive.
  (a) Histogram   (b) Bar chart   (c) Pie chart   (d) Cumulative frequency polygon

- Which one of the following distributions is continuous?
  (a) Binomial   (b) Normal   (c) Poisson   (d) All of these

- Which one of the following distributions has one parameter?
  (a) Normal   (b) Poisson   (c) Z-distribution   (d) Binomial

- The normal distribution has _____ parameter/s.
  (a) one   (b) two   (c) three   (d) four

- The Binomial distribution has _____ successes.
  (a) one   (b) two   (c) three   (d) 1 to n

- Poisson distribution is applied when p is small and no. of trials is _____
  (a) small   (b) large   (c) finite   (d) none

- If $X \sim B(20, 0.2)$, $\mu =$ _____
  (a) 2   (b) 3   (c) 4   (d) 5

- If $X \sim B(16, 0.2)$, $var(X) =$ _____
  (a) 2   (b) 2.56   (c) 25.6   (d) 256

- In which distribution, the mode, mean and median are equal?
  (a) Binomial   (b) Geometric   (c) Poisson   (d) Normal

- If $X \sim N(20, 4)$ and $X = 20$, then $Z =$ _____
  (a) 0   (b) 0.5   (c) 1   (d) 1.5

- The probability function of a discrete random variable X is defined as $f(x) =$ _____
  (a) $P(X \leq x)$ (b) $P(X \geq x)$ (c) $P(X = x)$ (d) $P(X \neq x)$

- In normal distribution, $P(z \geq 2.17) =$ _____
  (a) 0.015   (b) 0.65   (c) 0.485   (d) 0.985

- The numerical quantity describing a population is called _____
  (a) estimator   (b) statistic   (c) sample   (d) parameter

- The _____ population moment about origin is population mean.
  (a) first   (b) second   (c) third   (d) fourth

- The t-test is applied when sample size is small and σ is _____
  a) small   (b) large   (c) known   (d) unknown.

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Time Allowed: 100 Minutes.

Max. Marks: 42

Section II (Short Answer)

Q.2- Write short answers of the following. $3 \times 6 = 18$

I.   Differentiate between polygon and Ogive.

II. A box contains 20 DVDs, 4 of which are defective. If two DVDs are selected at random (without replacement) from the box, what is the probability that both are defective.

III. Calculate Q_1 and D_5 of following data.

No of assistants	0	1	2	3	4	5	6	7	8	9
F	3	4	6	7	10	6	5	5	3	1

IV. Compute σ^2 of 41, 37, 31, 39, 26, 36, 46, 48, 35.

V.   The probability that a man will be alive in 25 years is 3/5, and the probability of his wife will be alive in 25 years is 2/3. Find the probability of that neither will be alive in 25 years.

VI. Define co-efficient of variance and its significance.

Section III (Essay Type)

Answer the following Questions $6 \times 4 = 24$

Q # 3. Use the binomial distribution to find probability of

   i.   2 failures in 6 trials when $p = 0.6$.

   ii. 2 or fewer successes in 9 trails when $q = 0.6$.

Q # 4. Compute the least square regression equation of Y on X for the following data.

X	5	6	8	10	12	13	15	16	17
Y	16	19	23	28	36	41	44	45	50

Q # 5. An urn contains 10 white and 3 black balls. Another urn contains 3 white and black balls. Two balls are transferred from first urn and placed in second urn then one ball is taken at random from the later. What is the probability that it is a white ball?

Q # 6. The following table shows the distribution of the maximum loads in short tons supported by certain cables produced by a company.

Max. loads	9.8-10.2	10.3-10.7	10.8-11.2	11.3-11.7	11.8-12.2	12.3-12.7
No of cables	7	12	17	14	6	4

Determine the median and mode of the data.

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No. _____ 58

Roll No. (in fig.)_____

Roll No. (in words)_____
_____

Candidate's Signature.
_____

Signature of Addl. Supdt.
_____

SECTION: 1 (MCQ's)

Time Allowed: 20 Minutes   Max. Marks: 18

NOTE: Encircle the correct/ best answer in each of the followings. Each Question carries 1 mark. Use of remover carries zero mark. Cutting and Overwriting is not allowed.

Q1.

- Variance of constant number is....
  - a) 0
  - b) 1
  - c) -1
  - d) None

- If X is binomially distributed with mean 3.20 and variance 1.152 then value of p is...
  - a) 0.64
  - b) 0.36
  - c) 0.5
  - d) 1

- Binomial distribution is negative skewed for ......
  - a) $p = 0.5$
  - b) $p < 0.5$
  - c) $p > 0.5$
  - d) $p = 0$

- The value in the data which divides the data in two equal parts is called.....
  - a) Mean
  - b) Mode
  - c) Median
  - d) None

- How $X_m - X_0$ is called.....
  - a) Mean
  - b) Mode
  - c) Median
  - d) Range

- Larger the value of standard deviation means most of the observations in a data set are .....to the mean.
  - a) closer
  - b) scattered
  - c) equal
  - d) None

- Co-efficient of variation is unreliable for small values of ...... mean
  - a) arithmetic
  - b) geometric
  - c) harmonic
  - d) None

- Mean deviation is ....measure of dispersion.
  - a) Relative
  - b) *Absolute*
  - c) both a) and b)
  - d) None

- O give is drawn for _____ frequency.
  - a) cumulative
  - b) Relative
  - c) Simple
  - d) None

- Population frequency is denoted by......
  - a) $\bar{x}$
  - b) σ
  - c) μ
  - d) None

- For set of ungrouped data, If $n = 15$, $\sum x = 480$, $\sum x^2 = 15735$, then mean......
  - a) 16
  - b) 32
  - c) 64
  - d) None

- A uniform histogram is also called.......
  - a) Rectangular
  - b) Square
  - c) Symmetric
  - d) None

- The probability of obtaining at least one head is..... when three coins are tossed.
  - a) 1/8
  - b) 3/8
  - c) 7/8
  - d) None

- If $p(A) = 0.60$, $p(B) = 0.40$, $p(A \cap B) = .24$ then $p(A/B) = ...$
  - a) 0.4
  - b) 0.6
  - c) 0.8
  - d) None

- The value of data which appears maximum times in data is called ....
  - a) Mean
  - b) Mode
  - c) Median
  - d) None

- A distribution with two or more modes is called.....distribution.
  - a) zero-modal
  - b) bi-or Multimodal
  - c) Uni-modal
  - d) None

- If both the dependent and independent variables increases simultaneously then r will be in the range of.....
  - a) 0 to +1
  - b) 0 to -1
  - c) -1 to +1
  - d) None

- The probability of an event is always.......
  - a) < 0
  - b) in the range 0 to 1.0
  - c) > 1
  - d) None