Paper Code – 5406

M.Sc. Semester-III (Mathematics)
July-Septermber-2021
MTHEC-6 Statistical Methods

કુલ સમયઃ– : ૩૦ મીનીટ **કુલ પ્રશ્નો : ૩૫** **વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૧૮**

નોંધ : વિદ્યાર્થીએ માત્ર ૧૮ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૧૮ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

(1) Which of the following is not a measurement of dispersion?
(a) Range (b) Mean (c) Standard deviation (d) Variance

(2) Which of the following sets of data has an inter quartile range of 10?
(a) 3, 4, 9, 16, 17, 24, 31 (b) 41, 43, 49, 49, 50, 53, 55 (c) 12, 14, 17, 19, 19, 20, 21 (d) 55, 56, 56, 57, 58, 59, 62

(3) Which of the following is a unit free quantity?
(a) Range (b) Standard deviation (c) Coefficient of variation (d) Arithmetic mean

(4) If X and Y are independent random variables, then S.D(X ± Y) is equal to
(a) S.D(X) ± S.D(Y) (b) Var(X) ± Var(Y) (c) $\sqrt{Var(X) \pm Var(Y)}$ (d) $\sqrt{Var(X) + Var(Y)}$

(5) S.D(X) = 6 and S.D(Y) = 8. If X and Yare independent random variables, then S.D(X-Y) is____
(a) 2 (b) 10 (c) 14 (d) 100

(6) If standard deviation of the values 2, 4, 6, 8 is 2.236, then standard deviation of the values 4, 8,12, 16 is_____
(a) 0 (b) 4.472 (c) 4.236 (d) 2.236

(7) Find Quartiles deviation of the data
12, 10, 17, 14, 19, 21, 27, 30, 32, 28, 34
(a) 7 (b) 8 (c) 9 (d)10

(8) Mutually Exclusive events _____
(a) Contain all sample points (b) Contain all common sample points
(c) Does not contain any sample point (d) Does not contain any common sample point

(9) Let X be a real-valued random variable with $E[X]$ and $E\left[X^2\right]$ denoting the mean value of x and X^2, respectively. The relation which always holds true is
(a) $(E[X])^2 > E\left[X^2\right]$ (b) $(E[X])^2 < E\left[X^2\right]$ (c) $(E[X])^2 = E\left[X^2\right]$ (d) $(E[X])^2 \geq E\left[X^2\right]$

(10) What would be the probability of an event 'G' if H denotes its complement, according to the axioms of probability?
(a) *P (G) = 1 / P (H)* (b) *P (G) = 1 – P (H)* (c) *P (G) = 1 + P (H)* (d) *P (G) = P (H)*

(11) If *E(x) = 2* and *E(z) = 4*, then *E(z – x)* =?
(a) 2 (b) 6 (c) 0 (d) insufficient data

(12) If *P(x) = 0.5* and *x = 4*, then *E(x)* = ?
(a) 1 (b) 0.5 (c) 4 (d) 2

(13) If the probability of hitting the target is 0.4, find mean and variance.
(a) 0.4, 0.24 (b) 0.6, 0.24 (c) 0.4, 0.16 (d) 0.6, 0.16

(14) If *P(1) = P(3)* in Poisson's distribution, what is the mean?
(a) √2 (b) √3 (c) √6 d) √7

(15) If '*X*' is a random variable, taking values '*x*', probability of success and failure being '*p*' and '*q*' respectively and '*n*' trials being conducted, then what is the probability that '*X*' takes values '*x*'? Use Binomial distribution
(a) $P(X = x) = {}^nC_x\, p^x\, q^x$ (b) $P(X = x) = {}^nC_x\, p^x\, q^{(n-x)}$ (c) $P(X = x) = {}^xC_n\, q^x\, p^{(n-x)}$ (d) $P(x = x) = {}^xC_n\, p^n\, q^x$

(16) For larger values of '*n*', Binomial Distribution _____
(a) loses its discreteness (b) tends to Poisson Distribution
(c) stays as it is (d) gives oscillatory values

(17) The mean of hyper geometric distribution is _____
(a) n*k / N-1 (b) n*k-1 / N (c) n-1*k / N (d) n*k / N

(18) The recurrence relation between P(x) and P(x +1) in a Poisson distribution is given by _____
(a) P(x+1) – m P(x) = 0 (b) m P(x+1) – P(x) = 0
(c) (x+1) P(x+1) – m P(x) = 0 (d) (x+1) P(x) – x P(x+1) = 0

(19) Normal Distribution is symmetric is about _____
(a) Variance (b) Mean (c) Standard deviation (d) Covariance

(20) For a normal distribution its _____are equal.
(a) mean, median (b) median, mode (c) mean, mode (d) mean, median, mode

(21) The mean and variance of exponential distribution is given as _____ .
(a) $1/\lambda, 1/\lambda^2$ (b) λ, λ^2 (c) $\lambda^2, 1/\lambda$ (d) $1/\lambda^2, \lambda^2$

(22) What does the central limit theorem state?
(a) if the sample size increases sampling distribution mustapproach normal distribution
(b) if the sample size decreases then the sample distribution must approach normal distribution
(c) if the sample size increases then the sampling distribution much approach an exponential distribution
(d) if the sample size decreases then the sampling distribution much approach an exponential distribution

(23) In which of the following types of sampling the information is carried out under the opinion of an expert?
(a) quota sampling (b) convenience sampling (c) purposive sampling (d) judgment sampling

(24) Selection of a football team for FIFA World Cup is called as?
(a) random sampling (b) systematic sampling (c) purposive sampling (d) cluster sampling

(25) Find the number of all possible samples from a population containing 8 items from which 2 items are selected at random without replacement.
(a) 56 (b) 28 (c) 66 (d) 38

(26) Find the standard error of population proportion p for sampling with replacement. The population proportion is 0.5 and size of sample is 4.
(a) 0.5 (b) 0.25 (c) 0.225 (d) 0.375

(27) If $Y = 2 - 0.2X$, then the value of Y intercept is equal to:
(a) -0.2 (b) 2 (c) $0.2X$ (d) All of the above

(28) The value of the coefficient of correlation r lies between:
(a) 0 and 1 (b) -1 and 0 (c) -1 and +1 (d) -0.5 and +0.5

(29) In the regression equation $Y = a + bX$, b is called:
(a) Slope (b) Regression coefficient (c) Intercept (d) Both (a) and (b)

(30) If $b_{xy} = 0.20$ and $r_{xy} = 0.50$, then b_{xy} is equal to:
(a) 0.20 (b) 0.25 (c) 0.50 (d) 1.25

(31) If P(1) = P(3) in Poisson's distribution, what is the mean?
(a) √2 (b) √3 (c) √6 (d) √7

(32) In the mathematical Equation of Linear Regression $Y = \beta_1 + \beta_2 X + \epsilon$, (β_1, β_2) refers to _____ .
(a) (Y-Intercept, Slope) (b) (Slope, X-Intercept) (c) (X-intercept, Slope) (d) (slope, Y-Intercept)

(33) A population consist of three numbers 2, 3, 7. Consider all possible samples of size two which can be drawn with replacement from this population. What is the standard error of sample mean.
(a) 4 (b) 9 (c) 27 (d) 36

(34) The shape of the normal curve depends on its _____
(a) Mean deviation (b) Standard deviation (c) Quartile deviation (d) Correlation

(35) The number of different combination of n different objects taken r at time without repetition is____
(a) ${}^{n}P_{r}$ (b) ${}^{n}C_{r}$ (c) ${}^{r}P_{n}$ (d) ${}^{r}C_{n}$