**OBJECTIVE QUESTIONS**

**Probability & Statistics**

**UNIT – 3**

1. If the mean and variance of a Binomial distribution are 4 and 4/3 respectively then [ ]

a) 3 b) 6

c) 8 d) 2

2. Let X be a random variable that follows Binomial distribution with expectation E(X) = 7 and variance V(X) = 6 . Then the probability of success p is [ ]

|  |  |
| --- | --- |
| (a) 6/7 | (b) 36/49 |
| (c) 1/7 | (d) 1/49 |

3. Which among the following is the standard deviation of Binomial distribution ? [ ]

|  |  |
| --- | --- |
| (a) | (b) npq |
| (c) np2q | (d) np |

4. The area under the standard normal curve is [ ]  
 a) 0 b) 1 c) 1/2 d) 2

5. A lot has 10% defective items. Ten items are chosen randomly from this lot. The probability that exactly 2 of the chosen items are defective is [ ]

|  |  |
| --- | --- |
| (a) 0.0036 | (b) 0.1937 |
| (c) 0.2234 | (d) 0.3874 |

6.  In a Poisson Distribution, if ‘n’ is the number of trials and ‘p’ is the probability of success, then the mean value is given by? [ ]

|  |  |
| --- | --- |
| (a) m = np | (b) m = (np)2 |
| (c) m = np(1-p) | (d) m = p |

7. If ‘m’ is the mean of a Poisson Distribution, then variance is given by \_\_\_\_\_\_\_\_\_\_\_ [ ]

|  |  |
| --- | --- |
| (a) m2 | (b) m(1/2) |
| (c) m | (d) m/2 |

8. Poisson distribution is applied for \_\_\_\_\_\_\_\_\_\_\_ [ ]

|  |  |
| --- | --- |
| (a) Continuous Random Variable | (b) Discrete Random Variable |
| (c)Irregular Random Variable | (d) Uncertain Random Variable |

9. For a Poisson Distribution, if mean(m) = 1, then P(1) is? [ ]

|  |  |
| --- | --- |
| (a) 1/e | (b) e |
| (c) e/2 | (d) Indeterminate |

10. If ‘m’ is the mean of Poisson Distribution, the P(0) is given by \_\_\_\_\_\_\_\_\_\_\_ [ ]

|  |  |
| --- | --- |
| (a) e-m | (b) em |
| (c) e | (d) m-e |

11. Normal distribution is symmetric about \_\_\_\_\_\_\_\_ . [ ]

|  |  |
| --- | --- |
| (a) Standard variation | (b) mean |
| (c) covariance | (d) variance |

12. Standard normal distribution has which of the following properties [ ]

|  |  |
| --- | --- |
| (a) Mean = Variance = 1 | (b) Standard deviation = Variance = 0 |
| (c) Mean = 0 , Variance = 1 | (d) Mean = Standard deviation |

13. Let X be a normal random variable with mean zero and variance 9. If a = P(X ≥ 3), then P(|X| ≤ 3) equals [ ]

|  |  |
| --- | --- |
| (a) a | (b) 2a |
| (c) 1 -2a | (d) 1 - a |

14.Approximately what area is covered under the normal distribution curve between ±3 standard deviation? [ ]

|  |  |
| --- | --- |
| (a) 80% | (b) 88.60% |
| (c) 99.73% | (d) 68.00% |

15. The mean of a normal distribution is the average of the first ten natural numbers. Then what is the probability of variable between 4 and 7 , if P(x ≤ 4) = 1/5 [ ]

|  |  |
| --- | --- |
| (a) 4/5 | (b) 2/5 |
| (c) 9/10 | (d) 3/5 |

**UNIT - 4**

1. The finite population correction factor is [ ]

|  |  |
| --- | --- |
| (a) (n-N)/(N-1) | (b) (N-n)/(N-1) |
| (c)(N-1)/(N-n) | (d) None |

2. A population consisting of all real numbers is an example of [ ]

|  |  |
| --- | --- |
| (a) an infinite population | (b) a finite population |
| (c) sample | (d) none |

3. The standard error of the statistic sample mean(x̄) is [ ]

|  |  |
| --- | --- |
| (a) σ/√n | (b) σ2/√n |
| (c) √(σ/n) | (d) None |

4. If = 157 , = 155 , = 15 and n = 36 then z is [ ]

|  |  |
| --- | --- |
| (a) 0.8 | (b) 0.6 |
| (c) 0.08 | (d) None |

5. The sample of size 4 has values 25,28,26,25. Then variance of the sample is [ ]

|  |  |
| --- | --- |
| (a)2 | (b)2.5 |
| (c) 4.2 | (d) None |

6. The marks of 5 students in 1 subject are 45,47,49,61,48 and mean of the population is 52.

Then t=\_\_\_\_\_ [ ]

|  |  |
| --- | --- |
| (a) 0.7 | (b) 0.5 |
| (c) 0.6 | (d) None |

7. If the size of the sample is 5 and size of the population is 2000. The correction factor is [ ]

|  |  |
| --- | --- |
| (a) 0.999 | (b) 9.99 |
| (c) 99.9 | (d) None |

8. P(Z > 1.76) = \_\_\_\_\_\_\_\_\_\_\_\_ [ ]

|  |  |
| --- | --- |
| (a) 0.5 + P(0 < Z < 1.76) | (b) 0.5 – P(0 < Z < 1.76) |
| (c) P(0 < Z < 1.76) | (d) None |

9. The probability of including a specified unit/item in a sample of size n selected out of N

Units is [ ]

|  |  |
| --- | --- |
| (a) 1/N | (b) Nn |
| (c) Nc | (d) None |

10. If n = 40 , = 2.06 then the maximum error with 99% confidence is [ ]

|  |  |
| --- | --- |
| (a) 0.7377 | (b) 0.8387 |
| (c) 0.6387 | (d) 0.536 |

11. If n=100 , = 5 then the maximum error with 95% confidence is [ ]

|  |  |
| --- | --- |
| (a) 0.98 | (b) 1.2875 |
| (c) 3.92 | (d) 1.16 |

12. If the size of the sample is 25 and the maximum error with 95% confidence is 0.1 then the standard deviation of the sample is [ ]

|  |  |
| --- | --- |
| (a) 2.55 | (b) 2.12 |
| (c) 0.255 | (d) 0.025 |

13. If the maximum error with probability 0.95 is 1.2 and the standard deviation of population is 10, then sample size is [ ]

|  |  |
| --- | --- |
| (a) 26 | (b) 266 |
| (c) 267 | (d) 269 |

14.Asample of size n is taken froma population whose variance is 9 . The maximum error of estimate for with 95% confidence is 0.5 . Then n= [ ]

|  |  |
| --- | --- |
| (a) 12 | (b) 68 |
| (c) 128 | (d) 139 |

15. If the maximum error with 99% confidence is 0.25 and the sample size is 40 then = [ ]

|  |  |
| --- | --- |
| (a) 0.93 | (b) 1.93 |
| (c) 2.93 | (d) 2.55 |

16.A sample of size 64 is taken from a population whose variance is 2 with probability 0.99. Then the maximum error is [ ]

|  |  |
| --- | --- |
| (a) 0.456 | (b) 0.35 |
| (c) 0.24 | (d) 0.58 |

17.If the maximum error with 99% confidence is 0.86 and size of the sample is 144 , Then the variance of the population is [ ]

|  |  |
| --- | --- |
| (a) 2 | (b) 4 |
| (c) 8 | (d) 16 |

18. If n = 144 , = 4 and = 150 then 95% confidence interval for mean is [ ]

|  |  |
| --- | --- |
| (a) ( 149.35 , 150.65 ) | (b) ( 149.14 , 150.86) |
| (c) ( 149.15 , 150.85 ) | (d) None |

19. If n = 81 , = 4.5 and = 32 then 99% confidence interval for mean is [ ]

|  |  |
| --- | --- |
| (a) (30.71 , 33.29) | (b) ( 30.835 , 33.165 ) |
| (c) ( 31.02 , 32.98 ) | (d) None |

20. Arandom sample of size 169 was taken from a population whose variance is 25 and mean is 50. Then 99% confidence interval is [ ]

|  |  |
| --- | --- |
| (a) ( 49 , 51 ) | (b) ( 49.25 , 50.75 ) |
| (c) ( 48 , 50 ) | (d) None |

21. Arandom sample of size n =100 is taken froma population with =5.1. Giventhat the sample mean =21.6. Then the 95% confidence interval for thepopulation mean is [ ]

|  |  |
| --- | --- |
| (a) ( 20.6 , 22.6 ) | (b) ( 21.6 , 22.6 ) |
| (c) ( 20.28 , 22.9 ) | (d) None |

22. If a random sample of size n = 20 from a normal population with variance 2=144has the mean =34.3, then the 95% confidence interval for thepopulation mean is [ ]

|  |  |
| --- | --- |
| (a) ( 29 , 39.56 ) | (b) (29.8 , 39.5) |
| (c) ( 28.64 , 38.34 ) | (d) None |

23.Ina campus interview 64 students are attended for a test and taken an average of 28.5 minutes to complete the answers with a variance of 9.3 square minutes. The 99% confidence interval for the true average time it takes a freshman to complete the test is [ ]

|  |  |
| --- | --- |
| (a) (27.2 , 29.4 ) | (b) ( 27.5 , 29.5 ) |
| (c) ( 27.8 , 29.2 ) | (d) None |

24. The length of the time required to execute 100 programs has a mean of 5.68 sec and a standard deviation of 0.29 sec . Assuming that such measurements are normally distributed, the 99% confidence interval for the mean time length of execution is [ ]

|  |  |
| --- | --- |
| (a) (4.98 , 5.12) | (b) ( 4.95 , 5.05 ) |
| (c) (5.6 , 5.75 ) | (d) None |

25.The mean blood pressure of 25 patients in a certain hospital is 140 mm of Hg . If those data can be looked upon as a random sample from a normal population with standard deviation = 10 mm of Hg , Then 95% confidence interval of the population mean is [ ]

|  |  |
| --- | --- |
| (a) ( 22.8 , 25.24 ) | (b) ( 23.1 , 26.89 ) |
| (c) ( 23.34 , 26.66 ) | (d) None |

26. In a random sample of 60 sections of a pipe in a chemical plant , 8 shows signs of serious corrosion . The maximum error with 95% confidence for the true proportion of pipe sections is [ ]

|  |  |
| --- | --- |
| (a) 0.85 | (b) 0.085 |
| (c) 0.082 | (d) None |

27.A random sample of 500 apples were taken and out of which 60 were found to be bad. The maximum error with 95% confidence is [ ]

|  |  |
| --- | --- |
| (a) 0.016 | (b) 0.028 |
| (c) 0.037 | (d) 0.045 |

28.In a sample of 100 ceramic pistons made for an experimental designed engine , 18 were found to be cracked. The maximum error with 95% confidence is [ ]

|  |  |
| --- | --- |
| (a) 0.075 | (b) 0.098 |
| (c) 0.089 | (d) None |

29.In a sample of 500 people in Maharashtra 300 are wheat eaters. The maximum error with 99% confidence is [ ]

|  |  |
| --- | --- |
| (a) 0.056 | (b) 0.042 |
| (c) 0.067 | (d) None |

30.If we can assert with 95% that the maximum error is 0.5 and P=0.2 , then the sample size is [ ]

|  |  |
| --- | --- |
| (a) 122 | (b) 244 |
| (c) 256 | (d) 269 |

**UNIT – 5**

1.A statement about a population developed for the purpose of testing is called: [ ]

|  |  |
| --- | --- |
| (a) Hypothesis | (b)Hypothesis testing |
| (c)Level of significance | (d)Test-statistic |

2.Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called: [ ]

|  |  |
| --- | --- |
| (a)Null hypothesis | (b) Alternative hypothesis |
| (c)Statistical hypothesis | (d)Composite hypothesis |

3.A statement about the value of a population parameter is called: [ ]

|  |  |
| --- | --- |
| (a)Null hypothesis | (b)Alternative hypothesis |
| (c)Simple hypothesis | (d)Composite hypothesis |

4.Any statement whose validity is tested on the basis of a sample is called: [ ]

|  |  |
| --- | --- |
| (a)Null hypothesis | (b)Alternative hypothesis |
| (c)Statistical hypothesis | (d)Simple hypothesis |

5.A quantitative statement about a population is called: [ ]

|  |  |
| --- | --- |
| (a)Research hypothesis | (b)Composite hypothesis |
| (c)Simple hypothesis | (d)Statistical hypothesis |

6.A statement that is accepted if the sample data provide sufficient evidence that the null hypothesis is false is called: [ ]

|  |  |
| --- | --- |
| (a) Simple hypothesis | (b) Composite hypothesis |
| (c) Statistical hypothesis | (d) Alternative hypothesis |

7.The alternative hypothesis is also called: [ ]

|  |  |
| --- | --- |
| (a) Null hypothesis | (b) Statistical hypothesis |
| (c) Research hypothesis | (d) Simple hypothesis |

8.A hypothesis that specifies all the values of parameter is called: [ ]

|  |  |
| --- | --- |
| (a) Simple hypothesis | (b) Composite hypothesis |
| (c) Statistical hypothesis | (d) None of the above |

9.The hypothesis µ ≤ 10 is a: [ ]

|  |  |
| --- | --- |
| (a) Simple hypothesis | (b) Composite hypothesis |
| (c) Alternative hypothesis | (d) Difficult to tell. |

10.If a hypothesis specifies the population distribution is called: [ ]

|  |  |
| --- | --- |
| (a) Simple hypothesis | (b) Composite hypothesis |
| (c) Alternative hypothesis | (d) None of the above |

11.A hypothesis may be classified as: [ ]

|  |  |
| --- | --- |
| (a) Simple | (b) Composite |
| (c) Null | (d) All of the above |

12.The probability of rejecting the null hypothesis when it is true is called: [ ]

|  |  |
| --- | --- |
| (a) Level of confidence | (b) Level of significance |
| (c) Power of the test | (d) Difficult to tell |

13.The dividing point between the region where the null hypothesis is rejected and the region where it is not rejected is said to be: [ ]

|  |  |
| --- | --- |
| (a) Critical region | (b) Critical value |
| (c) Acceptance region | (d) Significant region |

14.If the critical region is located equally in both sides of the sampling distribution of test-statistic, the test is called: [ ]

|  |  |
| --- | --- |
| (a) One tailed | (b) Two tailed |
| (c) Right tailed | (d) Left tailed |

15.The choice of one-tailed test and two-tailed test depends upon: [ ]

|  |  |
| --- | --- |
| (a) Null hypothesis | (b) Alternative hypothesis |
| (c) None of these | (d) Composite hypotheses |

16.Test of hypothesis Ho: µ = 50 against H: µ > 50 leads to: [ ]

|  |  |
| --- | --- |
| (a) Left-tailed test | (b) Right-tailed test |
| (c) Two-tailed test | (d) Difficult to tell |

17.Test of hypothesis Ho: µ = 20 against H1: µ < 20 leads to: [ ]

|  |  |
| --- | --- |
| (a) Right one-sided test | (b) Left one-sided test |
| (c) Two-sided test | (d) All of the above |

18.Testing Ho: µ = 25 against H: µ ≠ 20 leads to: [ ]

|  |  |
| --- | --- |
| (a) Two-tailed test | (b) Left-tailed test |
| (c) Right-tailed test | (d) Neither (a), (b) and (c) |

19.A rule or formula that provides a basis for testing a null hypothesis is called: [ ]

|  |  |
| --- | --- |
| (a) Test-statistic | (b) Population statistic |
| (c) Both of these | (d) None of the above |

20.The range of test statistic-Z is: [ ]

|  |  |
| --- | --- |
| (a) 0 to 1 | (b) -1 to +1 |
| (c) 0 to ∞ | (d) -∞ to +∞ |

21.The range of test statistic-t is: [ ]

|  |  |
| --- | --- |
| (a) 0 to ∞ | (b) 0 to 1 |
| (c) -∞ to +∞ | (d) -1 to +1 |

22.If Ho is true and we reject it is called: [ ]

|  |  |
| --- | --- |
| (a) Type-I error | (b) Type-II error |
| (c) Standard error | (d) Sampling error |

23.The probability associated with committing type-I error is: [ ]

|  |  |
| --- | --- |
| (a) β | (b) |
| (c) 1 - | (d) 1 – α |

24.A failing student is passed by an examiner, it is an example of: [ ]

|  |  |
| --- | --- |
| (a) Type-I error | (b) Type-II error |
| (c) Unbiased decision | (d) Difficult to tell |

25.A passing student is failed by an examiner, it is an example of: [ ]

|  |  |
| --- | --- |
| (a) Type-I error | (b) Type-II error |
| (c) Best decision | (d) All of the above |

26.1 – α is also called: [ ]

|  |  |
| --- | --- |
| (a) Confidence coefficient | (b) Power of the test |
| (c) Size of the test | (d) Level of significance |

27.1 – α is the probability associated with: [ ]

|  |  |
| --- | --- |
| (a) Type-I error | (b) Type-II error |
| (c) Level of confidence | (d) Level of significance |

28.Area of the rejection region depends on: [ ]

|  |  |
| --- | --- |
| (a) Size of α | (b) Size of β |
| (c) Test-statistic | (d) Number of values |

29.Size of critical region is known as: [ ]

|  |  |
| --- | --- |
| (a) β | (b) 1 -β |
| (c) Critical value | (d) Size of the test |

30.A null hypothesis is rejected if the value of a test statistic lies in the: [ ]

|  |  |
| --- | --- |
| (a) Rejection region | (b) Acceptance region |
| (c) Both (a) and (b) | (d) Neither (a) nor (b) |