One Two academy

Maximum Marks: 45 Probability Distribution Duration: 90 minutes

Std 12 Business Mathematics and Statistics

Answer the following questions

5 X 1 = 5

 $4 \times 2 = 8$

- 1. Any random variable which follows binomial distribution is known as
- 2. In a binomial distribution, the probability of success is twice as that of failure. Then out of 4 trials, the probability of no success is
- 3. An experiment succeeds twice as often as it fails. The chance that in the next six trials, there shall be at least four successes is
- 4. Give any 2 examples of Binomial Distribution.
- 5. The area under the standard normal curve is equal to ___?.

Answer any four of the following:

- 6. A fair coin is tossed 6 times. Find the probability that exactly 2 heads occurs.
- 7. In a family of 3 children, what is the probability that there will be exactly 2 girls.
- 8. Weights of fish caught by a traveler are approximately normally distributed with a mean weight of 2.25 kg and a standard deviation of 0.25 kg. What percentage of fish weigh less than 2 kg?
- 9. Suppose A and B are two equally strong table tennis players. Which of the following two events is more probable: (a) A beats B exactly in 3 games out of 4 or (b) A beats B exactly in 5 games out of 8 ?
- 10. Define Bernoullis trials.
- 11. A car hiring firm has two cars. The demand for cars on each day is distributed as a Poisson variate, with mean 1.5. Calculate the proportion of days on which some demand is refused.

Answer any four of the following:

4 x 3 = 12

- 12. The mean of Binomials distribution is 20 and standard deviation is 4. Find the parameters of the distribution.
- 13. If the average rain falls on 9 days in every thirty days, find the probability that rain will fall on atleast two days of a given week.
- 14. Determine the binomial distribution for which the mean is 4 and variance 3. Also find P(X=15)
- 15. Write the conditions for which the poisson distribution is a limiting case of binomial distribution.
- 16. It is given that 5% of the electric bulbs manufactured by a company are defective. Using poisson distribution find the probability that a sample of 120 bulbs will contain no defective bulb.

17. If the chance of running a bus service according to schedule is 0.8, calculate the probability on a day schedule with 10 services : (i) exactly one is late (ii) atleast one is late .

Answer any four of the following:

$4 \ge 5 = 20$

- 18. If 5% of the items produced turn out to be defective, then find out the probability that out of 20 items selected at random there are
 - (i) exactly three defectives
 - (ii) atleast two defectives
 - (iii) exactly 4 defectives
 - (iv) find the mean and variance
- 19. Out of 750 families with 4 children each, how many families would be expected to have (Assume equal probabilities for boys and girls.)
 - (i) atleast one boy
 - (ii) atmost 2 girls and
 - (iii) children of both sexes?
- 20. An experiment succeeds twice as often as it fails, what is the probability that in next five trials there will be
 - (i) three successes and
 - (ii) at least three successes
- 21. In a photographic process, the developing time of prints may be looked upon as a random variable having the normal distribution with a mean of 16.28 seconds and a standard deviation of 0.12 second. Find the probability that it will take less than 16.35 seconds to develop prints.

22. The distribution of the number of road accidents per day in a city is poisson with mean 4. Find the number of days out of 100 days when there will be

- (i) no accident
- (ii) atleast 2 accidents and
- (iii) at most 3 accidents

 $(e^{-4} = 54.59815003)$

23. If 18% of the bolts produced by a machine are defective, determine the probability that out of the 4 bolts chosen at random

(i) exactly one will be defective

- (ii) none will be defective
- (iii) atmost 2 will be defective.

All the Best