CA FOUNDATION

SUBJECT- Maths, Logical Reasoning & Stats

Test Code – CFN 9271

(Date :)

(Marks - 50)

TOPICS : Theory of Chance (Probability), Random Variables and Mathematical Expectation, Binomial Distribution, Poisson Distribution, Normal Distribution

1) The probability that there is at least one error in an account statement prepared by A is 0.3 and for B and C, they are 0.4 and 0.45 respectively. A, B and C prepared 20, 10, and 40 statements respectively. The expected number of correct statements in all is:

(a) 32 (b) 45 (c) 42 (d) 25

2) In Venn diagram , if events A and B do not over-lap on each other, then events A and B are

(a) mutually exclusive (b) not mutually exclusive

(c) independent (d) dependent

3) Poisson distribution is

(a) always symmetric (b) positively skewed

(c) negatively skewed (d) symmetric when m = 4

4) For a group of students, 30%, 40% and 50% failed in Physics, Chemistry and at least one of the two subjects respectively. If an examinee is selected at random, what is the probability that he passed in Physics if it is known that he failed in Chemistry?

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

5) Which of the following is false in case of normal distribution.

(a) it is multi modal (b) mean = median = mode

(c) it is symmetric (d) Total are is 1

6) If two unbiased dice are rolled, what is the probability of getting sum of points neither 6 nor 9?

(a) 0.25 (b) 0.50 (c) 0.75 (d) 0.80

7) Total no. of success is thrice as much as it fails. The prob. of getting no success in 5 trials is…

(a) 1/512 (b) 1/1024 (c) 1/256 (d) none

8) Four coins were tossed 1600 times. What is the probability that all Four coins do not turn head upward at a time?

(a) 1600 e^{-100} (b) 1000 e^{-100} (c) 100 e^{-1600} (d) e^{-100}

9) What is the probability that a leap year selected at random would contain 53 Sundays?

(a) 3/7 (b) 2/7 (c) 5/12 (d) None

10) A random variable X follows Poisson distribution with parameter 4. Find the probability that P(X = 0) (given $e^{-4} = 0.0183$)

(a) 0.0183 (b) 0.15616 (c) 0.1952 (d) None of these

11) Two different dice are thrown simultaneously, then the probability that the sum of two numbers appearing on the top of dice is 9 is ____

(a) $\frac{8}{9}$ (b) $\frac{1}{9}$ (c) $\frac{7}{9}$ (d) None of these

12) The odds in favour of A solving a problem is 5:7 and Odds against B solving the same problem is 9:6. What is the probability that if both of them try, the problem will be solved?

(a) 117/180 (b) 181/200 (c) 147/180 (d) 119/180

13) Assuming that half the population is vegetarian and each of 128 investigators taken a sample of 10 individuals to see whether they are vegetarian. How many investigators would you expect to report that 2 people or less are/is vegetarian?

(a) 57 (b) 47 (c) 7 (d) None

14) If g(x) is a probability distribution function then

(a) For all value of x, g(x) is positive and total is one

(b) For all value of x, g(x) is non-negative

(c) Total probability is one

(d) Both (b) and (c)

15) Let two random variables x and y are related as 3x + 4y + 25 = 0 and v(x) = 6 then v(y) is

(a) 3.375 (b) 5.25 (c) -7.85 (d) None

16) The number of all accidents in a year attributed to taxi driver in a city follows poisson distribution with mean 3.Out of 1000 taxi drivers the estimated number of drivers with at least one accident in a year is $(e^{-1} = 0.3679, e^{-2} = 0.1353)$

(a) 50 (b) 632 (c) 865 (d) 950

17) Two broad divisions of probability are:

(a) Subjective probability and Objective probability

(b) Deductive probability and Mathematical probability

(c) Statistical probability and Mathematical probability

(d) None of these

18) In Standard Normal distribution

(a) mean = 1, SD = 0 (b) mean = 1, SD = 1

(c) mean = 0, SD = 1 (d) mean = 0, SD = 0

19) If A and B are two independent events and P(AUB) = 2/5; P(B) = 1/3 Find P(A)

(a) 2/9 (b) -1/3 (c) 2/10 (d) 1/10

20) A company has two cars which it hires out during the day. The number of cars demanded with mean 1.5. Then percentage of days on which only one car was in demand is equal to

(a) 23.26 (b) 33.47 (c) 44.62 (d) 46.40

21) Four married couples have gathered in a room. Two persons are selected at random amongst them, find the probability that selected persons are a gentleman and a lady but not a couple.

(a) $\frac{1}{7}$ (b) $\frac{3}{7}$ (c) $\frac{1}{8}$ (d) $\frac{3}{8}$

22) What are the limitations of the classical definition of probability?

(a) it is applicable if the elementary events are mutually independent

(b) it is applicable when the total number of elementary events is finite

(c) it is applicable if the elementary events are equally likely

(d) (b) and (c).

23) If the area of standard normal curve between z = 0 to z = 1 is 0.3412, then the value of ϕ (1) is _____.

(a) 0.5000 (b) 0.8413 (c) – 0.5000 (d) 1

24) If the sum of mean and variance of a binomial distribution is 6.4 for ten trials then value of the probability of success is each trial is

(a) 0.6 (b) 0.4 (c) 0.7 (d) 0.3

25) A card is drawn at random from a pack. If it is known that the card drawn is red, what is the probability that it is a diamond?

(a) 0.2 (b) 0.3 (c) 0.4 (d) 0.5

26) A card is drawn at random from a pack of 52 cards and its suit is observed, then it is placed back into the pack and all 52 cards are shuffled and another card is drawn. This random experiment is repeated five times. What is the probability that in the selected 5 cards, no club card is selected?

(a) $\frac{243}{1024}$ (b) $\frac{289}{1024}$ (c) $\frac{324}{1024}$ (d) $\frac{529}{1024}$

27) If X and Y are 2 independent normal variables with mean as 10 and 12 and SD as 3 and 4 , then (X +Y) is normally distributed with

(a) mean = 22 and SD = 7 (b) mean = 22 and SD = 25

(c) mean = 22 and SD = 5 (d) mean = 22 and SD = 49

28) If P(A) = $\frac{2}{3}$, P(B) = $\frac{3}{8}$, P(A$\cap$ B)= $\frac{1}{4}$, then the events A & B are_____

(a) Independent and mutually exclusive (b) Independent but not mutually exclusive

(c) Mutually exclusive but not independent (d) Neither Independent nor exclusive

29) Poisson distribution may be

(a) unimodal (b) bimodal (c) multi-modal (d) (a) or (b)

30) In a sample of 800 students, the mean weight and the standard deviation of weight are found to be 50 kg and 20 kg, respectively. On the assumption of normality, what is the number of students weighing between 46 kg and 62 kg? Given: area of the standard normal curve between z = 0 to z = 0.20 is 0.0793 and area between z = 0 to z = 0.60 is 0.2257.

(a) 250 (b) 244 (c) 240 (d) 260

31) In a Poisson distribution if P (x = 4) = P (x = 5) then the parameter of Poisson distribution is

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) 4 (d) 5

32) Find the probability of five digit no. using digits 1, 2, 5, 6, 8 which is divisible by 4.

(a) 3/10 (b) 5/10 (c) 8/10 (d) 7/10

33) There are 75 students in a class and their average marks is 50 and S.D of marks is 5.

Number of students who have secured more than 60 marks (Given that area under the normal curve for Z = 2 is 0.4772) is _____

(a) 1 (b) 2 (c) 3 (d) 4

34) For a normal distribution Q_1 = 13.25 and mean deviation about mode is 8. Then the value of median is ____.

(a) 14 (b) 20 (c) 22 (d) None

35) There are three horses in a race and the chances of winning of horse A is double than that of horse B and the chances of horse B is double than that of horse C. The probability of winning of C is

(a) 1/3 (b) 2/7 (c) 4/7 (d) 1/7

36) What is the probability of making 3 correct guesses in 5 True or False answer type questions?

(a) 0.3125 (b) 0.5676 (c) 0.6875 (d) 0.4325

37) Two letter are drawn at random from word “HOME” find the probability that there is no vowel.

(a) 5/6 (b) 1/6 (c) 1/3 (d) none of these

38) A bag contains 12 balls which are numbered from 1 to 12. If a ball is selected at random, what is the probability that the number of the ball will be a multiple of 5 or 6?

(a) 1/3 (b) 1/5 (c) 2/3 (d) none

39) x and y are two independent normal variate with respective mean as 5 and 7 and the standard deviation as 3 and 4. If a random variable z is defined as z = x + y then the distribution of z is also a normal with

(a) Mean = 12, SD = 7 (b) Mean = 12, SD = 25

(c) Mean = 12, SD = 5 (d) None

40) There are 6 Positive and 8 negative numbers. Four numbers are selected at random without replacement and multiplied . Find the probability that the product is positive.

(a) $\frac{420}{1001}$ (b) $\frac{409}{1001}$ (c) $\frac{70}{1001}$ (d) $\frac{505}{1001}$

41) Mathematical expectation is

(a) Always non-negative (b) Positive or zero

(c) any real number (d) none

42) The quartile of normal distribution are 8 and 14 respectively. The value of mode is

(a) 3 (b) 4.8 (c) 11 (d) none

43) Two dice are thrown together. Find the probability of getting a multiple of 2 on one dice and multiple of 3 on the other.

(a) $\frac{2}{3}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) None of these

44) What is the standard deviation of the number of recoveries among 48 patients when the probability of recovery is 0.75?

(a) 36 (b) 81 (c) 9 (d) 3

45) Sheehan draws 2 balls from a bag containing 3 white and 5 red balls. She gets Rs. 500 if she draws a white ball and Rs. 200 is she draws a red ball. What is the expectation if she is asked to pay Rs. 400 for participating in the game?

(a) 205 (b) 215 (c) 225 (d) 235

46) The probability that there is at least one error in balance sheet prepared by three CA articles X, Y and Z are 0.2, 0.3 and 0.1 respectively. If X, Y and Z prepared 60,70 & 90 such balance sheets, then the expected number of correct balance sheets is _____.

(a) 178 (b) 150 (c) 196 (d) None

47) If a random variable x follows Poisson distribution such that E(x) = 30, then the variance of the distribution is:

(a) 7 (b) 5 (c) 30 (d) 20

48) Suppose E and F are two events of a random experiment. If the Probability of occurrence of E is 1/5 and the Probability of occurrence of F given E is 1/10, then the probability of non-occurrence of at least one of the events E and F is:

(a) $\frac{1}{50}$ (b) $\frac{1}{25}$ (c) $\frac{13}{50}$ (d) $\frac{49}{50}$

49) The term “chance” and “probability” are synonyms:

(a) True (b) False (c) Both (d) None

50) The probability that a male is selected from a group of a person is 1/3. If six persons are selected at random from the group then the probability that at least a male and at least a female is selected is

(a) $\frac{65}{729}$ (b) $\frac{664}{729}$ (c) $\frac{2}{729}$ (d) none