UNIT TEST – 8(Statistics and Probability, Graphs, Practical geometry)
MATHEMATICS

CLASS: X standard   **MARKS: 100**

PART-I [Marks 14]

Answer all the 14 questions   **14x1=14**

1. Which of the following is not a measure of dispersion?
(a) Range   (b) Standard deviation   (c) Arithmetic mean (d) Variance

2. The range of the data 8, 8, 8, 8, 8. . . 8 is
(a) 0   (b) 1   (c) 8   (d) 3

3. The sum of all deviations of the data from its mean is
(a) Always positive   (b) always negative   (c) zero   (d) non-zero integer

4. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all deviations is
(a) 40000   (b) 160900   (c) 160000   (d) 30000

5. Variance of first 20 natural numbers is
(a) 32.25   (b) 44.25   (c) 33.25   (d) 30

6. The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is
(a) 3   (b) 15   (c) 5   (d) 225

7. If the standard deviation of x, y, z is p then the standard deviation of $3x + 5$, $3y + 5$, $3z + 5$ is
(a) 3p+5   (b) $3p$ (c) $p + 5$ (d) $9p + 15$

8. If the mean and coefficient of variation of a data are 4 and 87.5% then the standard deviation is
(a) 3.5   (b) 3   (c) 4.5   (d) 2.5

9. Which of the following is incorrect?
(a) $P(A) > 1$ (b) $0 \leq P(A) \leq 1$ (c) $P(\phi)=0$ (d) $P(A)+P(\overline{A}) = 1$

10. If A and B are mutually exclusive events then $P(A \cap B)=$_____
(a) 0   b) 1   (c) -1   (d) none of these

11. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is
(a) 3 /10   (b) 7 /10   (c) 3/ 9   (d) 7/ 9

12. The probability of getting a job for a person is $x/3$. If the probability of not getting the job is $2 / 3$ then the value of x is
(a) 2   (b) 1   (c) 3   (d) 1.5

13. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is 1/9 then the number of tickets bought by Kamalam is

(a) 5   (b) 10   (c) 15   (d) 20

14. If a letter is chosen at random from the English alphabets {$a,b,...,z$}, then the probability that the letter chosen precedes x

(a) 12/ 13   (b) 1/ 13   (C) 23/ 26   (D) 3/ 26

PARTS-II [MARKS: 20]
Answer all the questions [Question number 28 is compulsory]   10x2=20

15. Find the range and coefficient of range of the following data 25, 67, 48, 53, 18, 39, 44

16. The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value

17. Find the standard deviation of first 21 natural numbers

18. The mean of a data is 25.6 and its coefficient of variation is 18.75. Find the standard deviation

19. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.

20. The standard deviation and coefficient of variation of a data are 1.2 and 25.6 respectively. Find the value of mean.

21. A bag contains 5 blue balls and 4 green balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is blue

22. Two coins are tossed together. What is the probability of getting different faces on the coins?

23. A coin is tossed thrice. What is the probability of getting two consecutive tails?

24. What is the probability that a leap year selected at random will contain 53 Saturdays

25. A game of chance consists of spinning an arrow which is equally likely to come to rest pointing to one of the numbers 1, 2, 3,.....12. What is the probability that it will point to a prime number

26. If $P(A) = 0.37$, $P(B) = 0.42$, $P(A \cap B) = 0.09$ then find $P(AUB)$

27. If A and B are two events such that $P(A) = 1/4$, $P(B) = 1/2$ and $P(A$ and $B) = 1/8$, find (i) $P(A$ or $B)$ (ii) $P($not A and not $B)$.

28. Three fair coins are tossed together. Find the probability of getting at most two tails

PARTS-III [MARKS: 50]
Answer all the questions [Question number 42 is compulsory]   10x5=50

29. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

30. The marks scored by 10 students in a class test are 25, 29, 30, 33, 35, 37, 38, 40, 44, 48. Find the standard deviation.

31. A teacher asked the students to complete 60 pages of a record note book. Eight students have completed only 32, 35, 37, 30, 33, 36, 35 and 37 pages. Find the standard deviation of the pages yet to be completed by them

32. The marks scored by the students in a slip test are given below.

x	4	6	8	10	12
f	7	3	5	9	5

Find the standard deviation of their marks

33. The time taken by 50 students to complete a 100 meter race are given below. Find its standard deviation.

Time taken (sec)	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5
No.of students	6	8	17	10	9

34. Two unbiased dice are rolled once. Find the probability of getting
   (i) a doublet (equal numbers on both dice)   (ii) the product as a prime number
   (iii) the sum as a prime number   (iv) the sum as 1

35. Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4

36. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 8.

37. From a well-shuffled pack of 52 cards, a card is drawn at random. Find the probability of it being either a red king or a black queen.

38. A box contains cards numbered 3, 5, 7, 9......... 35, 37. A card is drawn at random from the box. Find the probability that the drawn card have either multiples of 7 or a prime number

39. Three unbiased coins are tossed once. Find the probability of getting atmost 2 tails or atleast 2 heads

40. In a class of 35, students are numbered from 1 to 35. The ratio of boys to girls is 4:3. The roll numbers of students begin with boys and end with girls. Find the probability that a student selected is either a boy with prime roll number or a girl with composite roll number or an even roll number

41. If A, B, C are any three events such that probability of B is twice as that of probability of A and probability of C is thrice as that of probability of A and if P(A∩B)=1/6,$P(B∩C)=1/4$, $P(A∩C)=1/8,P(A∪B∪C)=9/10,P(A∩B∩C)=$ 1/15, then find $P(A),P(B)$and $P(C)$?

42. In a town of 8000 people, 1300 are over 50 years and 3000 are females. It is known that 30% of the females are over 50 years. What is the probability that a chosen individual from the town is either a female or over 50 years

PARTS-IV [MARKS: 16]

Answer both questions   **2x8=16**

43.   a) Draw a circle of diameter 6 cm from a point P, which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.
                                    (OR)
       b) Draw a triangle ABC of base BC = 8 cm, A=$\underline{|60}$º and the bisector of ÐA meets BC at D such that BD = 6 cm.

44.   a) Draw the graph of y=x^2+x-2 and hence use it to solve x^2+x-2=0
                                    (OR)
       b) Draw the graph of y=x^2-5x-6 and hence use it to solve x^2-5x-14=0

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