

## UNIT TEST-8

## X-STD

## MATHEMATICS

TIME: 3.00 HOURS

MARKS: 100



## ALPHA MATHS ACADEMY

JEE, CBSE AND BOARD EXAMINATION COACHING CENTER

TENKASI

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**Instructions:** 1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

2) Use Blue or Black ink to write and underline and pencil to draw diagrams.

## PART-A

 $14 \times 1 = 14$ 

- Which of the following is not a measure of dispersion?  
 (a) variance (b) arithmetic mean (c) range (d) standard deviation
- The sum of all deviation of the data from its mean is  
 (a) zero (b) always positive (c) always negative (d) non-zero integer
- If the mean and co-efficient of variation of data are 4 and 87.5% then the standard deviation is  
 (a) 4.5 (b) 2.5 (c) 3 (d) 3.5
- A page is selected at random from a book. The probability that the digit at unit place of the page number chosen is less than 7 is  
 (a)  $\frac{3}{10}$  (b)  $\frac{3}{9}$  (c)  $\frac{7}{10}$  (d)  $\frac{7}{9}$
- $P(A \cup B) + P(A \cap B)$  is  
 (a)  $P(A) + P(B)$  (b)  $2(P(A) + P(B))$  (c) 1 (d) 0
- The probability of getting a job for a person is  $\frac{x}{3}$ . If the probability of not getting the job is  $\frac{2}{32}$  then the value of  $x$  is  
 (a) 1 (b) 2 (c) 1.5 (d) 3
- If a letter is chosen at random from the English alphabets  $\{a, b, \dots, z\}$ , then the probability that the letter chosen precedes  $x$   
 (a)  $\frac{12}{13}$  (b)  $\frac{1}{13}$  (c)  $\frac{23}{26}$  (d)  $\frac{3}{26}$
- 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)  $9p + 15$

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9. If the variance is 0.49, then the standard deviation is  
 (a) 0.7 (b) 0.07 (c) 0.007 (d) none of these
10. Variance of first 20 natural number is  
 (a) 32.25 (b) 33.25 (c) 44.25 (d) 30
11. The probability a red marble selected at random from a jar containing  $p$  red,  $q$  blue and  $r$  green marbles is  
 (a)  $\frac{q}{p+q+r}$  (b)  $\frac{p}{p+q+r}$  (c)  $\frac{p+q}{p+q+r}$  (d)  $\frac{p+r}{p+q+r}$
12. The range of first 10 prime number is  
 (a) 7 (b) 5 (c) 9 (d) 27
13. The sum of all the observation divided by number of observation is called  
 (a) range (b) mean (c) standard deviation (d) variance
14. A purse contains 10 notes of ₹2000, 15 notes of ₹500, and 25 notes of ₹200. One note is drawn at random. What is the probability that the note is either a ₹500 note or ₹200 note?  
 (a)  $\frac{1}{5}$  (b)  $\frac{3}{10}$  (c)  $\frac{2}{3}$  (d)  $\frac{4}{5}$

**PART-B****10 × 2 = 20****Note: i) Answer any TEN questions.****ii) Question No.28 is compulsory.**

15. The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.
16. Find the standard deviation of first 21 natural numbers.
17. The mean of the data is 25.6 and its co-efficient of variation is 18.75 find the standard deviation.
18. Express the sample space for rolling two dice using tree diagram.
19. What is the probability that a leap year selected at random will contain 53 Sundays.
20. A coin is tossed thrice. What is the probability of getting two consecutive tails?
21. If  $A$  and  $B$  are two events such that  $P(A) = \frac{1}{4}$ ;  $P(B) = \frac{1}{2}$  and  $P(A \text{ and } B) = \frac{1}{8}$ . Find  $P(\text{not } A \text{ and not } B)$
22.  $A$  and  $B$  are two candidates seeking admission to IIT. The probability that  $A$  getting selected is 0.5 and probability that both  $A$  and  $B$  getting selected is 0.3. Prove that the probability of  $B$  being selected is atmost 0.8.

23. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the co-efficient of variation
24. If the range and the smallest value of a set of data are 36.8 and 13.4 respectively. Find the Largest Value.
25. A die is rolled and a coin is tossed simultaneously. Find the probability of the die shows an odd number and the coin shows head.
26. In a two children family, find the probability that there is at least one girl in a family.
27. A wall clock strikes the bell once at 1 o'clock, 2 o'clock, 3 times at 3 o'clock and so on. How many times will strike in a particular day. Find the standard deviation of the number strikes the bell makes a day.
28. If  $n = 5$ ,  $\bar{x} = 6$ ,  $\sum x^2 = 765$ , then calculate the coefficient of variation.

**PART-C**

**$10 \times 5 = 50$**

**Note: i) Answer any TEN questions.**

**ii) Question No.42 is compulsory.**

29. Three coins are tossed simultaneously. Find the probability of getting exactly two heads or at least one tail or consecutively two heads.
30. A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.
31. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3 respectively. They are rolled and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9 separately.
32. The time taken (*in minutes*) to complete a homework by 8 students in a day are given by 38, 40, 47, 44, 46, 43, 49, 53. Find the coefficient of variation.
33. Find the mean and variance of the first  $n$  natural numbers.
34. The marks scored by the students in a slip test are given below.

$x$	4	6	8	10	12
$y$	7	3	5	9	5

35. The mean and variance of seven observations are 8 and 16 respectively. If five of these are 2, 4, 10, 12 and 14, then find the remaining two observations.
36. A bag contains 12 blue balls and  $x$  red balls. If one ball is drawn at random
  - (i) what is the probability that it will be a red ball?
  - (ii) If 8 more red balls are put in the bag and if the probability of drawing a red ball will be twice that of the probability in (i) then find  $x$ .

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37. If for a distribution  $\sum(x - 5) = 3$  ;  $\sum(x - 5)^2 = 43$  and total number of observation is 18. Find the mean and standard deviation.

38. The rainfall recorded in various places of five districts in a week are given below.

Rainfall (in mm)	45	50	55	60	65	70
Number of places	5	13	4	9	5	4

39. State and prove Thales theorem.

40. The following table gives the values of mean and variance of heights and weights of the 10th standard students of a school.

	Height	Weight
Mean	155 cm	46.50 kg <sup>2</sup>
Variance	72.25 cm <sup>2</sup>	28.09 kg <sup>2</sup>

41. 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

42. The probability that a student will pass the final examination in both English and Tamil is 0.5 and the probability of passing neither is 0.1. If the probability of passing the English examination is 0.75, what is the probability of passing the Tamil examination?

### PART-D

2 × 8 = 16

**Note:** Answer ALL the questions.

43. (a) Construct a  $\Delta PQR$  in which  $QR = 5\text{cm}$ ,  $\angle P = 40^\circ$  and the median  $PG$  from  $P$  to  $QR$  is  $4.4\text{ cm}$ . Find the length of the altitude from  $P$  to  $QR$ . (or)

(b)  $PQ$  is a chord of length  $8\text{ cm}$  to a circle of radius  $5\text{ cm}$ . The tangents at  $P$  and  $Q$  intersect at a point  $T$ . Find the length of the tangent  $TP$ .

44. (a) Draw the graph of  $y = x^2 - 4$  and hence solve  $x^2 - x - 12 = 0$ . (or)

(b) The following table shows the data about the number of pipes and the time taken fill the same tank.

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No. of pipes $(x)$	2	3	6	9
Time taken (in min) $(y)$	45	30	15	10

Draw the graph for the above data and hence

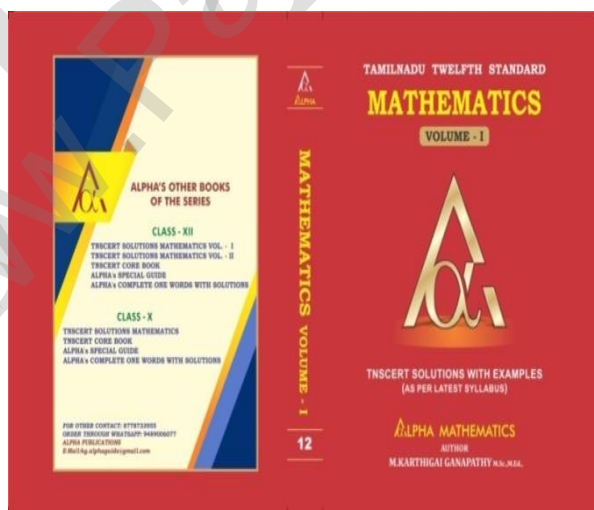
- Find the time taken to fill the tank when 5 pipes are used.
- Find the number of pipes when the time is 9 min.

\*\*\*\*\* ALL THE BEST \*\*\*\*\*

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