SSLC MATHS
CHAPTER-1(RELATIONS AND FUNCTIONS)

TWO MARKS

1. Let A = {1, 3, 5} and B= {2, 3} then (i) find A x B and B x A.
ii) Is A X B = B X A? If not why?
iii) Show that n (A X B) = n (B XA) =n (A) X n (B)

2. Let A={1,2,3} and B={x | x is a prime number less than 10}. Find AxB and B xA.

3. If $A \times B$ = {(3,2), (3,4), (5,2), (5,4)} then find A and B.

4. If $B \times A$ = {(-2,3), (-2,4), (0,3), (0,4, (3,3), (3,4)} find A and B.

5. Let A={3,4,7,8} and B={1,7,10}. Which of the following sets are relations from A to B?
i) R_1={(3,7),(4,7),(7,10),(8,1)} ii) R_2= {(3, 1), (4, 2)}
iii) R3={(3,7), (4,10), (7, 7), (7,8),(8,11),(8,7),(8,10)}

6. Let A={1,2,3,4,...,45} and R be the relation defined as "is square of" on A. Write R as a subset of A x A. Also, find the domain and range of R.

7. A Relation R is given by the set {(x, y)/y=x+3, x€{0, 1, 2, 3, 4}}. Determine its domain and range.

8. Represent each of the given relations by (a) an arrow diagram, (b) a graph and (c) a set in roster form, wherever possible.
i) {(x, y)|x=2y, x€{2, 3, 4, 5}, y€{1, 2, 3, 4}
ii) {(x, y)|y=x+3, x, y are natural numbers <10}

9. Let X={1,2,3, 4) and Y={2,4,6,8,10} and R={(1,2),(2,4),(3,6),(4,8)}.
Show that R is a function and find its domain, co-domain and range?

10. A relation 'f' is defined by f(x) = x^2-2 where x€ {-2, -1, 0, 3}
i) List the element of f ii) Is f a function?

11. If X = {−5, 1, 3, 4} and Y = {a, b, c}, then which of the following relations are functions from X to Y?
(i) R_1 = {(−5, a), (1, a), (3, b)} (ii) R_2 = {(−5, b), (1, b), (3, a), (4, c)}
(iii) R_3 = {(−5, a), (1, a), (3, b), (4, c), (1, b)}

12. Let A={1,2,3} B={4,5,6,7} and f={(1,4),(2,5),(3,6)} be a function from

A to B. Show that f is one – one but not onto function.

13. If $A = \{-2, -1, 0, 1, 2\}$ f: $A \longrightarrow B$ is an onto function defined by $f(x)=x^2+x+1$ then find B.

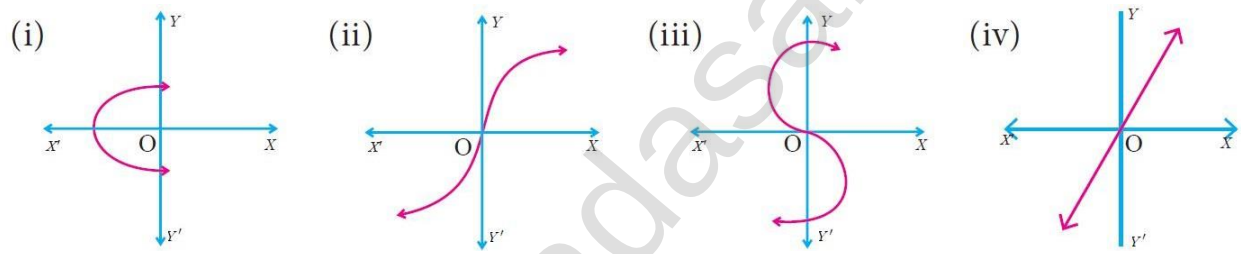
14. Show that the function F: N $\longrightarrow$ N defined by f(x) =2x-1 is one-one but not onto.

15. Show that the function F: N $\longrightarrow$ N defined by $f(x) =m^2+m+3$ is one-one function.

16. Let $A = \{-1, 1\}$ and $B = \{0, 2\}$ If the function $f: A \quad B$ defined by $f(x) = ax + b$ an onto function? Find a and b.

17. Let f be a function from R to R defined by $f(x) = 3x - 5$ Find the values of a and b given that $(a, 4)$ and $(1, b)$ belong to f.

18. Determine whether the graph given below represent functions. Give reason for your answers concerning each graph.



19. Find f o g and g o f when $f(x) = 2x+1$ and $g(x) = x^2-1$

20. Using the functions f and g given below, find fog and gof. Check whether $f o g = go f$.
i) $f(x)=x-6, g(x)=x^2$ ii) $f(x)=2/x, g(x)=2x^2-1$ iii) $f(x) = 3+x, g(x) = x - 4$

21. Find k, if $f(k)=2k-1$ and f o f(k)=5

22. If $f(x) =x^2 - 1$ and $g(x) = x – 2$, find a if g o f(a) = 1

23. If $f(x) = x^2 – 1$ find i) f o f ii) f o f o f

24. Let $f=\{(1,3),(0,1),(2,9)\}$ be a linear function from Z into Z. Find $f(x)$.

FIVE MARKS

1. Let $A=\{x \in N \mid 1<x<4\}$, $B=\{x \in W \mid 0 \leq x<2\}$ and $C=\{x \in N \mid x<3\}$ then verify that i) AX

(BUC)=(AXB)U(AXC)ii)AX(B∩C)=(AXB)∩(AXC)

2.Let $A=\{x \in W \mid x<2\}, B=\{x \in N \mid 1<x \leq 4\}$ and $C=\{3,5\}$ then verify that
i) $A X (B U C) = (A X B) U (A X C)$ ii) $A X (B \cap C) = (A X B) \cap (A X C)$
iii) (AUB) X C = (A x C) U (B X C)

3. If $A=\{5,6\}, B=\{4,5,6\}, c=\{5,6,7\}$ show that $A x A = (B x B) \cap (C x C)$

4. Given the function f: x ⟶ x^2- 5x + 6, evaluate
i) f(-1) ii) f(2a) iii) f(2) iv) f(x-1)

5. A function *f* is defined by f(x) = 2x-3
i) find $\frac{f(0) + f(1)}{2}$
ii) find x such that f(x) =0
ii) find x such that f(x) =x
iii) find x such that f(x) =f(1-x)

6. Let *A* = {1, 2, 3, 4} and *B* = {2, 5, 8, 11, 14} be two sets. Let *f: A* ⟶ *B* be a function function given by f(x) =3x-1. Represent this function
(i) by arrow diagram (ii) in a table form
(iii) as a set of ordered pairs (iv) in a graphical form

7. Let *A* = {2,4,6,10,12} and *B* = {0,1,2,4,5,9} be two sets. Let *f: A* ⟶ *B* be a function function given by f(x) = $\frac{x}{2}$ -1. Represent this function
(i) Set of ordered pairs (ii) a table
(iii) an arrow diagram (iv) a graph

8. Forensic scientists can determine the height (in cms) of a person based on the length of their thigh bone. They usually do so using the function h(b) = 2. 47b + 54. 10 where b is the length of the thigh bone.
(i) Check if the function h is one – one
(ii) Also find the height of a person if the length of his thigh bone is 50 cms.
(iii) Find the length of the thigh bone if the height of a person is 147. 96 cms.

9. If the function f: R ⟶ R is define by $f(x) = \begin{cases} 2x+7, & x< -2 \\ x^2-2, & -2\leq x <3 \\ 3x-2, & x\geq 3 \end{cases}$

i) f(4) ii f(-2) iii) f(4) + 2 f(1) iv) $\frac{f(1) - 3 f(4)}{f(-3)}$

10. If the function f is defined by $f(x) = \begin{cases} x+2, & \text{if } x>1 \\ 2, & \text{if } -1 \le x \le 1 \\ x-1, & \text{if } -3<x<1 \end{cases}$

i) f(3) ii f(0) iii) f(-1.5) iv) f(2) + f(-2)

11. If the function f: {-5, 9] ⟶ R is define by $f(x) = \begin{cases} 6x+1, \text{ if } -5 \le x < 2 \\ 5x^2-1, \text{ if } 2 < x < 6 \\ 3x-4, \text{ if } 6 \le x \le 9 \end{cases}$

i) f(-3) + f(2) ii) f(7) - f(1) iii) 2f4)+ f(8) iv) $\frac{2f(-2) - f(-6)}{f(4) + f(-2)}$

12. The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by t(C) =F where $F = \frac{9}{5}C + 32$

Find (i) $t(0)$ (ii) $t(28)$ (iii) $t(-10)$
(iv) the value of C when $t(C) = 212$
(v) the temperature when the Celsius value is equal to the Farenheit value.

13. Find the value of k, such that f o g = g o f,
(ii)i)f(x)=3x+2andg(x)=6x-k ii) f(x) = 2x – k and g(x) = 4x + 5

14.If f(x) = 2x+3, g(x) = 1-2x and h(x) = 3x prove that fo(goh) = (fog)oh

15. Consider the functions $f(x), g(x), h(x)$ as given below. Show that $(fog)\,h = fo(goh)$ in each case.
i) $f(x) = x^2$, g(x) = 3x+1, $h(x) = x^2$
ii) $f(x) = x^2$, g(x) = 2x, h(x) = x+4
iii) f(x) = x – 4, $g(x) = x^2$, h(x) = 3x-5

16. Find x if gff(x) = fgg(x), given f (x) = 3 x+1 and g (x) =x+3.

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2. NUMBERS AND SEQUENCES

TWO MARKS

1. Find the quotient and remainder when a is divided by b in the following cases

(i) a = −12 , b = 5 (ii)a = 17 , b = −3 (iii)a = −19 , b =−4

2. Show that the square of an odd integer is of the form 4q+1 , for some integer q.

3. If the Highest Common Factor of 210 and 55 is expressible in the form 55x, - 325, find x.

4. Find the greatest number that will divide 445 and 572 leaving remainders 4 and 5 respectively

5. Find all positive integers, when divided by 3 leaves remainder 2.

6. A man has 532 flower pots. He wants to arrange them in rows such that each row contains 21 flower pots. Find the number of completed rows and how many flower pots are left over.

7. Prove that the product of two consecutive positive integers is divisible by 2.

8. Use Euclid's Division Algorithm to find the Highest Common Factor (HCF) of

(i) 340 and 412 (ii) 867 and 255 (iii) 10224 and 964 iv) 84, 90 and 120

9. Is 7x 5 × 3x 2 + 3 a composite number? Justify your answer

10. 'a' and 'b' are two positive integers such that $a^b \times b^a = 800$. Find 'a' and 'b'

11. If $13824 = 2^a \times 3^b$ then find a and b.

12. Find the HCF of 252525 and 363636

13. Find the largest number which divides 1230 and 1926 leaving remainder 12 in each case.

14. If d is the Highest Common Factor of 32 and 60, find x and y satisfying d x = + 32 60y .

15. A positive integer when divided by 88 gives the remainder 61. What will be the remainder when the same number is divided by 11?

16. Prove that two consecutive positive integers are always co prime.

17. Find the LCM and HCF of 408 and 170 by applying the fundamental theorem of arithmetic

18. What is the smallest number that when divided by three numbers such as 35, 56 and 91 leaves remainder 7 in each case?

19. Find the least number that is divisible by the first ten natural numbers.

20. Find the least positive value of x such that (i) $71 \equiv x \pmod 8$ (ii) $78 + x \equiv 3 \pmod 5$

(iii) $89 \equiv x+3 \pmod 4$ (iv) $96 \equiv x / 7 \pmod 5$ (v) $5x \equiv 4 \pmod 6$

21. Find the least positive value of x such that (i) $67 + x \equiv (\text{mod } 4)$ (ii) $98 \equiv x + 4 (\text{mod } 5)$

22. What is the time 100 hours after 7 a.m.?

23. What is the time 15 hours before 11 p.m.?

24. Find the remainder when 281 is divided by 17.

25. Find the next three terms of the sequences (i) 1/ 2 , 1/ 6 , 1 /10 , 1/ 14 , ...

(ii) 5, 2 -1 ,-4 ,....

26. Find the general term for the following sequences (i) 3, 6, 9 …..... (ii) 1/ 2, 2/ 3, 3 /4……...

(iii) 5, -25 ,125,...

27. The general term of a sequence is defined as

$$a_n = \begin{cases} n(n+3); n \in N \text{ is odd} \\ n^2+1; \ n \in N \text{ is odd} \end{cases}$$ Find the eleventh and eighteenth terms.

28. Find the first six terms of the∞If a1 = 1, a2 = 1 $a_n = 2a_{n-1} + a_{n-2}$sequence.

29. Write an A.P. whose first term is 20 and common difference is 8.

31. Find the number of terms in the A.P. 3, 6, 9, 12,…, 111.

32. Find the 19th term of an A.P. -11,-15,- 19 ……..

33. Which term of an A.P. 16, 11, 6, 1,... is -54 ?

34. Find the middle term(s) of an A.P. 9, 15, 21, 27,…,183

35. Find the sum of first 15 terms of the A. P. 8, 7, $\frac{1}{4}$ 6 1 , $\frac{5}{2}$ 3 $\frac{}{4}$ …….

36. Find the sum of 0. 40 +0.43+ 0. 46 +……. +1

37. Find the 8th term of the G.P. 9, 3, 1……

38. In a G.P. 729, 243, 81…… find t7 .

39. Find the number of terms in the following G.P 4, 8, 16……. 8192?

40. Find the 10th term of a G.P. whose 8th term is 768 and the common ratio is 2

41. Find the first term of a G.P. in which $S_6 = 4095$ and r = 4

42. How many terms of the series 1+4+1 6 +……..make the sum 1365?

43. Find the sum 3 +1+ 1/ 3 + …….+∞

44. Find the rational form of the number 0. 6666

45. Find the value of (i) 1 +2 + 3+…….. 50 (ii) 16+ 17+ 18+……+ 75

46. Find the sum of (i) 1 +3 + 5 +……40terms ii) 2+4+6 +…… + 80 (iii) 1 +3 +5 +……+ 55

47. Find the sum of $1^2+2^2+3^2+$…….$+19^2$

48. Find the sum of $1^3+2^3+3^3+$…….$+16^3$

49. If 1+ 2 +3 + …….+n=666 then find n.

50. If 1+ 2 +3 + …….+ k =325then find $1^3+2^3+3^3+$…….$+ k^3$

Five Marks

1. Find the 15^{th} , 24^{th} and n^{th} term (general term) of an A.P. given by 3, 15, 27, 39,…

2. In an A.P., sum of four consecutive terms is 28 and the sum of their squares is 276. Find the four numbers.

3. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.

4. If nine times ninth term is equal to the fifteen times fifteenth term, show that six times twenty fourth term is zero

5. Find x, y and z, given that the numbers x, 10, y, 24, z are in A.P.

6. The ratio of 6th and 8th term of an A.P. is 7:9. Find the ratio of 9th term to 13th term.

7. In a winter season let us take the temperature of Ooty from Monday to Friday to be in A.P. The sum of temperatures from Monday to Wednesday is 0° C and the sum of the temperatures from Wednesday to Friday is 18° C. Find the temperature on each of the five days.

8. Priya earned ₹ 15,000 in the first month. Thereafter her salary increased by ₹ 1500 per year. Her expenses are ₹ 13,000 during the first year and the expenses increases by ₹ 900 per year. How long will it take for her to save ₹ 20,000 per month.

9. 3 How many terms of the series 1+ 5+9 …….. must be taken so that their sum is 190?

10. The 13th term of an A.P. is 3 and the sum of first 13 terms is 234. Find the common difference and the sum of first 21 terms.

11. Find the sum of all natural numbers between 300 and 600 which are divisible by 7

12.How many consecutive odd integers beginning with 5 will sum to 480?

13. Find the sum of first 28 terms of an A.P. whose nth term is 4n -3 .

14. The sum of first n terms of a certain series is given as $2n^2-3n$. Show that the series is an A.P.

15. The 104th term and 4th term of an A.P. are 125 and 0. Find the sum of first 35 terms.

16. Find the sum of all natural numbers between 602 and 902 which are not divisible by 4

17. Find the sum of all odd positive integers less than 450.

18. Raghu wish to buy a laptop. He can buy it by paying ₹ 40,000 cash or by giving it in 10 installments as ₹ 4800 in the first month, ₹ 4750 in the second month, ₹ 4700 in the third month and so on. If he pays the money in this fashion, find (i) total amount paid in 10 installments. (ii) how much extra amount that he has to pay than the cost?

19. A man repays a loan of ₹ 65,000 by paying ₹ 400 in the first month and then increasing the payment by 300 every month. How long will it take for him to clear the loan? 10. A brick staircase has a total of 30 steps. The bottom step requires 100 bricks. Each successive step requires two bricks less than the previous step. (i) How many bricks are required for the top most step? (ii) How many bricks are required to build the stair case?

20. If $S_1, S_2, \ldots\ldots\ldots\ldots, S_m$ are the sums of n terms of m A.P.'s whose first terms are 1, 2,3...m and whose common differences are 1, 3, ,5,…… (2m-1) respectively, then show that $S_1+S_2,\ldots\ldots+S_m=1/2mn(mn+1)$

21. Find the sum $\left[\frac{a-b}{a+b} + \frac{3a-2b}{a+b} + \frac{5a-3b}{a+b} + \ldots\ldots\ldots 12 \text{ terms}\right]$

22. If a, b, c are three consecutive terms of an A.P. and x, y, z are three consecutive terms of a G.P. then prove that $x^{b-c} \times y^{c-a} \times z^{a-b} = 1$.

23. The sum of first n, 2n and 3n terms of an A.P. are S_1, S_2 and S_3 respectively. Prove that $S_3=3(S_2-S_1)$

24. If $S_n=(x+y)+(x^2+xy+y^2)+(x^3+x^2y+xy^2+y^3)+\ldots\ldots\ldots\ldots n$

then prove that $(x-y)S_n=\left[\frac{x2(xn-1)}{x-1} - \frac{y2(yn-1)}{y-1}\right]$

25. In a Geometric progression, the 4th term is 8/ 9 and the 7th term is 64 /243 . Find the Geometric Progression.

26. The product of three consecutive terms of a Geometric Progression is 343 and their sum is 91/ 3 . Find the three terms.

27. In a G.P. the 9th term is 32805 and 6th term is 1215. Find the 12th term

28. Find the sum to n terms of the series

i)5+ 55 + 555 +……n terms ii) 3+ 33 + 333 +……n terms

iii)0.4+0.44+0.044+……+n terms

29. Find the sum of

i) $15^2+16^2+17^2+\ldots\ldots\ldots\ldots+28^2$ ii) $6^2+7^2+\ldots\ldots\ldots\ldots+21^2$

30. Find the sum of

i)$9^3+10^3+11^3+\ldots\ldots\ldots\ldots+21^{3+}$ ii) $10^3+11^3+\ldots\ldots\ldots\ldots+23^3$

31. Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm,…, 24 cm. How much area can be decorated with these colour papers?

32. Find the sum of the series $(2^3-1)+(4^3-3^3)+(6^3-5^3)+$……to (i) n terms (ii) 8 terms

33. The sum of the squares of the first n natural numbers is 285, while the sum of their cubes is 2025. Find the value of n.

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3. ALGEBRA

Two marks

1. The father's age is six times his son's age. Six years hence the age of father will be four times his son's age. Find the present ages (in years) of the son and father.

2. Solve $2x-3y = 6$, $x+y = 1$

3. Find the LCM of the following
i) x^4-1, x^2-2x+1 ii) $x-27$, $(x-3)^2$, x^2-9 iii)p^2-3p+2,p^2-4 iv)$2x^2-5x-3$, $4x^2-36$

4. Reduce the rational expressions to its lowest form
i) $\frac{x^2-16}{x^2+8x+16}$ ii) $\frac{9x^2+81x}{x^3+8x^2-9x}$ iii) $\frac{x^2-11x+18}{x^2-4x+4}$

5. Find the excluded values of the following expressions

i) $\frac{7p}{8p2+13p+5}$ ii) $\frac{t}{t^2-5t+6}$ iii) $\frac{x^3-27}{x^3+x^2-6x}$

6. Simplify
i) $\frac{x^3}{x-y} + \frac{y^3}{y-x}$ ii) $\frac{x(x+1)}{x-2} + \frac{x(1-x)}{x-2}$

7. Find the square root of the following expressions
i) $256\,(x-1)^8(x-b)^4(x-c)^{16}(x-d)^{20}$ ii) $16x^2+9y^2-24xy+24x—18y+9$

8. Find the zeroes of the quadratic expression $x^2+8x+12$

9. Write down the quadratic equation in general form for which sum and product of the roots are given below
i) 9, 14 ii) 5/3, 4 iii) -3/2, -1 iv) -7/2, 5/2

10. Find the sum and product of the roots for each of the following quadratic equations
i) $x^2+8x-65=0$ ii) $2x^2+5x+7$ iii) $x^2+3x-28=0$ iv) $x^2+3x=0$

11. Solve the following quadratic equations by factorization method
i)$4x^2-7x-2=0$ ii)$2x^2-x+\frac{1}{8}$ iii) $x^4-13x^2+42=0$

12. Solve the following quadratic equations by completing the square method

i) $x^2-3x-2=0$ ii) $2x^2-x-1=0$ iii) $9x^2-12x+4$

13. Solve the following quadratic equations by formula method

i) $x^2-2x-2=0$ ii) $2x^2-3x-3=0$ iii) $2x^2-5x+2$

14 If the difference between a number and its reciprocal is 5/4. Find the number.

15. Determine the nature of roots for the following quadratic equations

i)$x^2-x-20=0$ ii) $9x^2-24x=16=0$ iii)$2x^2-2x+9=0$

16. If the difference between the roots of the equation x2-13x+k=0is 17 find k

17. Define diagonal Matrix

18. Define transpose of a matrix.

19 .If a matrix has 16 elements, what are the possible orders it can have?

20. If a matrix has 18 elements, what are the possible orders it can have? What if it has 6 elements?

21. Construct a 3x3 matrix whose elements are

i) $a_{ij} = i^2j^2$ ii) $a_{ij} = |i-2j|$ iii) $\frac{(i+j)^3}{3}$

22. If A= $\begin{pmatrix} 5 & 4 & 3 \\ 1 & -7 & 9 \\ 3 & 8 & 2 \end{pmatrix}$ then find the transpose of A

23.. If A= $\begin{pmatrix} 5 & 2 & 2 \\ 17 & 0.7 & 5/2 \\ 8 & 3 & 1 \end{pmatrix}$ then verify $(A^T)^T=A$

24. Find the values of *x, y* and *z* from the following equations

i) $\begin{pmatrix} x+y & 2 \\ 5+z & xy \end{pmatrix} = \begin{pmatrix} 6 & 2 \\ 5 & 8 \end{pmatrix}$ ii) $\begin{pmatrix} 12 & 3 \\ x & 3/2 \end{pmatrix} = \begin{pmatrix} y & z \\ 3 & 5 \end{pmatrix}$

25. If A = $\begin{pmatrix} 1 & 4 & 5 \\ 7 & 5 & 2 \\ 1 & 3 & 5 \end{pmatrix}$ and B = $\begin{pmatrix} 8 & 6 \\ 5 & 4 \\ 2 & 9 \end{pmatrix}$ find A +B

26. If $A = \begin{bmatrix} 7 & 8 & 6 \\ 1 & 3 & 9 \\ -4 & 3 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 11 & -3 \\ -1 & 2 & 4 \\ 7 & 5 & 0 \end{bmatrix}$ find 2A +B

27. If $A = \begin{bmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{bmatrix}$

Find the value of i) B-5A ii)3A-9B

28. If $A = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$ find AB and BA.

29. Solve $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$

30. If $A = \begin{bmatrix} \cos\theta & 0 \\ 0 & \cos\theta \end{bmatrix}$ and $B = \begin{bmatrix} \sin\theta & 0 \\ 0 & \sin\theta \end{bmatrix}$ then show that $A^2+B^2=I$

31. If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ Prove that $AA^T=I$

32. Verify that $A^2=I$ when $A = \begin{bmatrix} 5 & -4 \\ 6 & -5 \end{bmatrix}$

Five marks

1. Solve the following system of linear equations in three variables
i) 3x-2y+z =2, 2x+3y-z=5, x + y + z=6
ii) x+ 2y –z =5, x- y + z =-2, -5x-4y+z=-11
iii)x + y+ z=5, 2x-y+z=59, x-2y+3z = 16

2. Discuss the nature of solutions of the following system of equations
i) 3x-y+z = 1, 2x-y+2z=1, -x-y +z = 2
ii)x+2y-z= 6, -3x-2y+5z= -12, x-2z=3
iii) 2y+z=3(-x+1), -x+3y-z=-4, 3x+2y+z=-1/2

3. Vani, her father and her grand father have an average age of 53. One-half of her grand father's age plus one-third of her father's age plus one fourth of Vani's age is 65. Four years ago if Vani's grandfather was four times as old as Vani then how old are they all now

4. There are 12 pieces of five, ten and twenty rupee currencies whose total value is ₹105. When first 2 sorts are interchanged in their numbers its value will be increased by ₹20. Find the number of currencies in each sort

5. Find the GCD of the polynomials

i) x^3+x^2-x+2 and $2x^3-5x+5x-3$

ii) $6x^3-30x^2+60x-48$ and $3x^3-12x^2+21x-18$

iii) $3x^4+6x^3-12x^2-24x$ and $4x^4+14x^3+8x^2-8x$

iv) $3x^3+3x^2+3x+3$ and $6x^3+12x^2+6x+12$

6. Simplify $\dfrac{2a^2+5a+3}{3a^2+7a+6} \div \dfrac{a^2+6a+5}{-5a+-35a-50}$

7If $x = \dfrac{a^2+3a-4}{3a^2-3}$ and $y = \dfrac{a^2+2a-8}{2a^2-2a-4}$ find the value of x^2y^{-2}

8. Simplify $\dfrac{1}{x^2-5x+6} + \dfrac{1}{x^2-3x+2} - \dfrac{1}{x^2-8x+15}$

9. If $A = \dfrac{2x+1}{2x-1}$ and $B = \dfrac{2x-1}{2x+1}$ find $\dfrac{1}{A-B} - \dfrac{2B}{A^2-B^2}$

10. If $A = \dfrac{x}{X+1}$ and $B = \dfrac{1}{x+1}$ find $\dfrac{(A+B)^2+(A-B)^2}{A \div B} = \dfrac{2(x^2+1)}{x(x+1)^2}$

11. Find the square root of

i) $(6x^2+x-1)(3x^2+2x-1)(2x^2+3x+1)$ ii) $(4x^2-9x+2)(7x^2-13x-2)(28x^2-3x-1)$

12. Find the square root of the following polynomials by division method

i) $\dfrac{x^2}{y^2} - \dfrac{10x}{y} + 27 - \dfrac{10y}{x} + \dfrac{y^2}{x^2}$

ii) $\dfrac{4x^2}{y^2} + \dfrac{20x}{y} + 13 - \dfrac{30y}{x} + \dfrac{9y^2}{x^2}$

iii) $64x^4-16x^3+17x^2-2x+1$

iv) $x^4-12x^3+42x^2-36x+9$

v) $121x^4-198x^3+183x^2+216x+144$

13. Find the values of *a* and *b* if the following polynomials are perfect squares

i) $9x^4+12x^3+28x^2+ax+b$ ii) $4x^4-12x^3+37x^2+bx+a$

iii) $ax^4+bx^3+361x^2+220x+100$

14. Find the values of *m* and *n*if the following polynomials are perfect squares

i) $x^4-8x^3+mx^2+nx+16$ ii) $\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{m}{x} + n$

15. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.

16. A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would have taken 30 minutes less for the journey. Find the original speed of the bus.

17. A pole has to be erected at a point on the boundary of a circular ground of diameter 20 m in such a way that the difference of its distances from two diametrically opposite fixed gates P and Q on the boundary is 4 m. Is it possible to do so? If answer is yes at what distance from the two gates should the pole be erected?

18.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?

19. There is a square field whose side is 10 m. A square flower bed is prepared in its centre leaving a gravel path all round the flower bed. The total cost of laying the flower bed and gravelling the path at ₹3 and ₹4 per square metre respectively is ₹364. Find the width of the gravel path.

20. Prove that the equation $x^2(p^2+q^2)+2x(pr+qs)+r^2+s^2=0$ has no real roots.
If $ps=qr$, then show that the roots are real and equal.

21. If α, β *are* the roots of the equation$x^2+7x+10=0$ find the values of

i)$\alpha-\beta$ ii)$\alpha^2+\beta^2$ iii)$\alpha^3-\beta^3$ iv) $\alpha^4+\beta^4$ v) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ vi) $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

22. If α, β *are* the roots of the equation $3x^2+7x-2=0$ find the values of

i) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ ii) $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

23. If α, β *are* the roots of the equation $2x^2-x-1=0$ then form the equation whose roots are

i) $\frac{1}{\alpha}, \frac{1}{\beta}$ ii) $\alpha^2\beta + \beta^2\alpha$ iii) $2\alpha+2\beta$

24. If α, β *are* the roots of the equation $x^2+6x-4=0$ then form the equation whose roots are

i) α^2 and β^2 ii) $\frac{2}{\alpha}$ and $\frac{2}{\beta}$ iii) $\alpha^2\beta$ and $\beta^2\alpha$

25. If α, β *are* the roots of the equation $7x^2+ax+2=0$ and if $\beta - \alpha = -13/7$ find the values of a.

26. Find x and Y if $X+Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X-Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

27. solve for x, y $\begin{bmatrix} x2 \\ y2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \end{bmatrix}$

28. If A = (1 -1 2) $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

then show that (AB) C=A (BC)

29. If $A = \begin{bmatrix} 1 & 1 \\ -1 & 3 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ -4 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} -7 & 6 \\ 3 & 2 \end{bmatrix}$

Verify that A(B + C) = AB + AC

30. If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T=B^TA^T$

31. If $A = \begin{bmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$ show that $(AB)^T = B^T A^T$

32. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I_2 = 0$

33. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then show that $A^2 - (a+d)A = (bc-ad)I_2$

34. If $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$

Show that i) $A(BC) = (AB)C$ ii) $(A - B)C = AC - BC$ iii) $(A-B)^T = A^T - B^T$

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5. COORDINATE GEOMETRY

TWO MARKS

1. Show that the points P (-1.5, 3), Q (6,-2), R (-3, 4) are collinear

2 Find the slope of a line joining the given points
i) (-6, 1) and (-3, 2) ii) (14, 10) and (14,-6) iii) (5, $\sqrt{5}$) with origin

3. The line r passes through the points $(-2, 2)$ and $(5, 8)$ and the line s passes through the points $(-8, 7)$ and $(-2, 0)$. Is the line r perpendicular to s?

4. The line p passes through the points (3, - 2), (12, 4) and the line q passes through the points (6,-2) and (12, 2). Is p parallel to q?

5. The line through the points (-2, a) and (9, 3) has slope $-1/2$. Find the value of a.

6. Find the equation of a straight line whose

(i) Slope is 5 and y intercept is -9 (ii) Inclination is 45° and y intercept is 11

7. Calculate the slope and y intercept of the straight line 8x-7y+6=0

8. Find the equation of a line passing through the point (3,-4) and having slope -5 / 7

9. Find the equation of a straight line which has slope -5/4and passing through the point $(-1, 2)$.

10 Find the equation of a straight line passing through
i) (5,-3) and (7,-4) ii) (2, 3) and (-7,-1)

11. Find the intercepts made by the following lines on the coordinate axes.

(i) $3x-2y-6=0$ (ii) 4x+3y+12=0 iii) 4x-9y+36=0

12. Find the equation of a line whose intercepts on the x and y axes are given below.
(i) $4, -6$ (ii) -5, 3/4

13. Find the slope of the straight line 6 x + 8y + 7=0.

14. Find the slope of the line which is (i) parallel to $3x-7y = 11$ (ii) perpendicular to 2x-3y+8=0

15. Show that the straight lines 2x+3y-8=0 and $4x+6y+18=0$ and are parallel

16. Show that the straight linesx-2y+3=0 and 6x+$3y$ +8 =0 and are perpendicular.

17. Find the equation of a straight line which is parallel to 3x-7y=12the line and passing through the point (6, 4).

18. If the straight lines $12y = -(p+3)x+12$, $12x-7y = 16$are perpendicular then find 'p'.

Five Marks

1. If the area of the triangle formed by the vertices $A(-1,2)$, $B(k,-2)$ and $C(7,4)$ (taken in order) is 22 sq. units, find the value of k.

2. If the points $P(-1,-4)$, $Q(b, c)$ and $R(5,-1)$ are collinear and if $2b+c=4$, then find the values of b and c.

3. The floor of a hall is covered with identical tiles which are in the shapes of triangles. One such triangle has the vertices at (-3, 2) (-1,-1) and (1, 2). If the floor of the hall is completely covered by 110 tiles, find the area of the floor.

4. Find the area of the quadrilateral formed by the points
i) (8, 6), (5, 11), (-5, 12) and (-4, 3) (ii) (−9, −2), (−8, −4), (2, 2) and (1, −3)

(iii) (−9, 0), (−8, 6), (−1, −2) and (−6, −3)

5. Find the value of k, if the area of a quadrilateral is 28 sq.units, whose vertices are
(–4, –2), (–3, k), (3, –2) and (2, 3)

6. Without using Pythagoras theorem, show that the points (1-4), (2,-3) and (4,-7) form

a right angled triangle.

7. Let A (3,-4), B (9,-4), C (5,-7) and D (7,-7). Show that $ABCD$ is a trapezium.

8. A quadrilateral has vertices at $A(-4,-2)$, $B(5,-1)$, $C(6,5)$ and $D(-7,6)$. Show that the mid-points of its sides form a parallelogram.

9. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes

through (-3, 8). Find its equation

10. Find the equation of the median and altitude of ΔABC through A where the vertices are
A (6, 2) B (-5,-1), and C (1, 9)

11. Find the equation of a straight line passing through the point $P(-5,2)$ and parallel to the line joining the points $Q(3,-2)$ and $R(-5,4)$

12. Find the equation of a line passing through (6,–2) and perpendicular to the line joining the points (6, 7) and (2,–3).

13. A(-3,0) $B(10,-2)$ and $C(12,3)$ are the vertices of ΔABC. Find the equation of the altitude through A and B.

14. Find the equation of the perpendicular bisector of the line joining the points A (-4, 2) and
B (6,-4)

15. Find the equation of a straight line through the intersection of lines $7x+3y=10$, $5x-4y=1$ and parallel to the line $13x+5y+12=0$.

16. Find the equation of a straight line through the intersection of lines $5x-6y=2, 3x+2y=10$ and perpendicular to the line $4x-7y+13=0$

17. Find the equation of a straight line joining the point of intersection of $3x+y+2=0$ and $x-2y-4=0$ to the point of intersection of $7x-3y=-12$ and $2y=x+3$

18. Find the equation of a straight line through the point of intersection of the lines $8x+3y=18$, $4x+5y=9$ and bisecting the line segment joining the points $(5,-4)$ and $(-7, 6)$.

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7. MENSURATION

Two marks

1. A cylindrical drum has a height of 20 cm and base radius of 14 cm. Find its curved surface area and the total surface area.

2. The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2. Find the diameter of the cylinder.

3A garden roller whose length is 3 m long and whose diameter is 2.8 m is rolled to level a garden. How much area will it cover in 8 revolutions?.

4. If the total surface area of a cone of radius 7cm is 704 cm^2, then find its slant height.

5. Find the diameter of a sphere whose surface area is 154 m^2.

6. The radius of a spherical balloon increases from 12 cm to 16 cm as air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.

7. If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area?

8. The internal and external radii of a hollow hemispherical shell are 3 m and 5 m respectively. Find the T.S.A. and C.S.A. of the shell..

9. The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area

10. 4 persons live in a conical tent whose slant height is 19 cm. If each person require 22 cm2 of the floor area, then find the height of the tent.

11. Find the volume of a cylinder whose height is 2 m and whose base area is 250 m^2.

12. The volume of a cylindrical water tank is 1.078×10^6 litres. If the diameter of the tank is 7 m, find its height.

13. Find the volume of the iron used to make a hollow cylinder of height 9 cm and whose internal and external radii are 21 cm and 28 cm respectively.

14. The volume of a solid right circular cone is 11088 cm3. If its height is 24 cm then find the radius of the cone.

15. If the circumference of a conical wooden piece is 484 cm then find its volume when its

height is 105 cm.

16. The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3. Find the ratio of heights.

17. If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.

18. A conical flask is full of water. The flask has base radius *r* units and height *h* units, the water poured into a cylindrical flask of base radius *xr* units. Find the height of water in the cylindrical flask.

Five marks

1. If one litre of paint covers 10 m^2, how many litres of paint is required to paint the internal and external surface areas of a cylindrical tunnel whose thickness is 2 m, internal radius is 6 m and height is 25 m.

2. The radius of a conical tent is 7 m and the height is 24 m. Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4 m?

3. An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4 m and whose height is 4 m. Find the curved and total surface area of the bucket.

4. A solid iron cylinder has total surface area of 1848 sq.m. Its curved surface area is five – sixth of its total surface area. Find the radius and height of the iron cylinder.

5. A girl wishes to prepare birthday caps in the form of right circular cones for her birthday party, using a sheet of paper whose area is 5720 cm^2, how many caps can be made with radius 5 cm and height 12 cm.

6. The internal and external diameters of a hollow hemispherical vessel are 20 cm and 28 cm respectively. Find the cost to paint the vessel all over at 0.14 per cm^2 .

7. Calculate the weight of a hollow brass sphere if the inner diameter is 14 cm and thickness is 1mm, and whose density is 17.3 g/ cm^3.

8. If the radii of the circular ends of a frustum which is 45 cm high are 28 cm and 7 cm, find the volume of the frustum

9. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs.40 per litre.

10.A 14 m deep well with inner diameter 10 m is dug and the earth taken out is evenly spread all around the well to form an embankment of width 5 m. Find the height of the embankment.

11. A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small cylindrical metal of radius 5 cm and height 4 cm is immersed it completely. Calculate the raise of the water in the glass?

12. A conical container is fully filled with petrol. The radius is 10m and the height is 15 m. If the container can release the petrol through its bottom at the rate of 25 cu. meter per minute, in how many minutes the container will be emptied. Round off your answer to the nearest minute

13. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs.40 per litre

14. A metallic sphere of radius 16 cm is melted and recast into small spheres each of radius 2 cm. How many small spheres can be obtained?

15A cone of height 24 cm is made up of modeling clay. A child reshapes it in the form of a cylinder of same radius as cone. Find the height of the cylinder

16A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm, having a hemispherical cap. Find the number of cones needed to empty the container.

17. An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

18. Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tanks will rise by 21 cm.

19. A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10 cm, find the internal diameter.

20. Seenu's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (underground tank) which is in the shape of a cuboid. The sump has dimensions 2 m x 1.5 m x 1 m. The overhead tank has its radius of 60 cm and height 105 cm. Find the volume of the water left in the sump after the overhead tank has been completely filled with water from the sump which has been full, initially.

21. The internal and external diameter of a hollow hemispherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, then find the height of the cylinder.

22. A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm, then find the thickness of the cylinder.

23. A toy is in the shape of a cylinder surmounted by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12 cm.

24.A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14 cm and the height of the vessel is 13 cm. Find the capacity of the vessel.

25. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of the model that Nathan made.

26. From a solid cylinder whose height is 2.4 cm and the diameter 1.4 cm, a cone of the same height and same diameter is carved out. Find the volume of the remaining solid to the nearest cm^3 .

27. A capsule is in the shape of a cylinder with two hemisphere stuck to each of its ends. If the length of the entire capsule is 12 mm and the diameter of the capsule is 3 mm, how much medicine it can hold?

28. A funnel consists of a frustum of a cone attached to a cylindrical portion 12 cm long attached at the bottom. If the total height be 20 cm, diameter of the cylindrical portion be 12 cm and the diameter of the top of the funnel be 24 cm. Find the outer surface area of the funnel.

29. A shuttle cock used for playing badminton has the shape of a frustum of a cone is mounted on a hemisphere. The diameters of the frustum are 5 cm and 2 cm. The height of the entire shuttle cock is 7 cm. Find its external surface area

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8. STATISTICS AND PROBABILITY

Two marks

1. Find the range and coefficient of range of the following data:
i) 25, 67, 48, 53, 18, 39, 44. (ii) 63, 89, 98, 125, 79, 108, 117, 68
(iii) 43.5, 13.6, 18.9, 38.4, 61.4, 29.8

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

3. If the range and the smallest value of a set of data are 36.8 and 13.4 respectively, then find the largestvalue.

4. Find the standard deviation of first 21 natural numbers

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

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

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

8. If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.

9. 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 (i) blue (ii) not blue.

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

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

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

13. A die is rolled and a coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows a head.

14. 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 (i) 7 (ii) aprime number (iii) a compositenumber?

15. Three fair coins are tossed together. Find the probability of getting
(i) all heads (ii) atleast one tail
(iii) atmost one head (iv) atmost two tails.

16. A bag contains 5 red balls, 6 white balls, 7 green balls, 8 black balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is (i) white (ii) black or red (iii) not white

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

18. If $P(A) = 2/3$, $P(B) = 25$, $P(AUB) = 1/3$, then find $P(A \cap B)$.

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

20. What is the probability of drawing either a king or a queen in a single draw from a well shuffled pack of 52 cards?

Five marks

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

2. 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

3. 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.

4. The amount that the children have spent for purchasing some eatables in one day trip of a school are 5, 10, 15, 20, 25, 30, 35, 40. Using step deviation method, find the standard deviation of the amount they have spent.

5. 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.

6. Find the variance and standard deviation of the wages of 9 workers given below: ₹310, ₹290, ₹320, ₹280, ₹300, ₹290, ₹320, ₹310, ₹280.

7. 48 students were asked to write the total number of hours per week they spent on watching television. With this information find the standard deviation of hours spent for watching television.

x	6	7	8	9	10	11	12
f	3	6	9	13	8	5	4

8. 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

9. Marks of the students in a particular subject of a class are given below.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No.of students	8	12	17	14	9	7	4

10.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

11. Two dice are rolled. Find the probability that the sum of outcomes is (i) equal to 4 (ii) greater than 10 (iii) less than 13

12. 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

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

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

15. 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.

16. 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.

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

18. 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?

19. A coin is tossed thrice. Find the probability of getting exactly two heads or atleast one tail or two consecutive heads.

20. 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 $P(A \cap B)=1/6\, P(B \cap C)=1/4\,, P(A \cap C)=1/8\,, P(AUBUC)=9/10\,, P(A \cap B \cap C)=1/15\,,$ then find *P(A),P(B)*and *P(C)* ?

21. 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.

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