MATHS

BOOKS - OSWAAL PUBLICATION

SOLVED PAPER 2019-1

Exercise

1. Write the following set in roster form A = { x is a natural number less than 6}

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2. If P ={ a, b, c} and Q = {r} , find $P \times Q$.

3. Convert $\dfrac{7\pi}{6}$ radians in degree measure ?

4. Express $(-5i)\left(\dfrac{1}{8}i\right)$ in the form a + ib .

5. Evaluate $4! - 3!$.

6. Write the first five terms of the sequence defined by

$a_n = 2n + 5$

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7. Find the slope of the line passing through the points(3,-2) and (-1,4).

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8. Evaluate $\lim\limits_{x \to 4} \dfrac{4x + 2}{x - 2}$.

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9. Write the negation of the statement 'Australia is a continent'

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10. A coin is tossed four times.

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11. If A={3,5,7,9,11},B={7,9,11,13},C={11,13,15}.Find $A \cap (B \cup C)$

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12. If X and Y are two sets such that n(X)=17,n(Y)=23 and

$n(X \cup Y)$=35,Find$n(X \cap Y)$.

13. Let $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$ be a

linear function $f(x) = mx + c$ from Z into Z.Find the value

of m and c.

14. Find the radius of the circle in which a central angle of

$60°$ intercepts an arc of length 37.4 cm (use $\pi = \dfrac{22}{7}$)

15. Find the general solution of $\cos x = \left(\dfrac{1}{2}\right)$.

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16. Solve each of the following equations.

1. Solve $x^2 + x + 1 = 0$

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17. The marks obtained by a student of class XI in the first and second terminal examination are 62 and 48 respectively. Find the minimum marks he should get in the

annual examination to have an average of at least 60 marks

.

18. Find the equation of the line passing through the point(-2,3) and having slope -5.

19. Find the distance of the point (3,-5) from the line $3x - 4y - 26 = 0$

20. Find the co-ordinates of the point P which divides the line segment joining the points A (1, - 2 ,3) and B (3 , 4 - 5) internally in the ratio 2 : 3

21. $\lim\limits_{x \to 0} \dfrac{\sqrt{1 + x} - 1}{x} =$

22. Write the component statement of the following compund statement and check whether they are true or false "All prime numbers are either even or odd".

23. Two series A and B with equal means standard deviation 9 and 10 respectively . Which series is more consistent ?

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24. A committee of two persons is selected from two men and two women.What is the probability that the committee will have (i) no men (ii)two men

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25. A committee of two persons is selected from two men and two women. What is the probability that the

committee will have (a) no man? (b) one man? (c) two men?

26. Let U={1,2,3,4,5,6}, A={2,3},B={3,4,5}. Prove that

$(A \cup B)' = A' \cap B'$

27. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real functions. Find $(f + g)(x)$, $(f - g)(x)$, $(fg)(x)$, $\left(\dfrac{f}{g}\right)(x)$.

28. Prove that $\tan 3x = \dfrac{3\tan x - \tan^3 x}{1 - 3\tan^2 x}$

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29. Represent the complex number $Z = 1 = i\sqrt{3}$ in the polar form .

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30. If $x + iy = \dfrac{a + ib}{a - ib}$, prove that $x^2 + y^2 = 1$

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31. In how many of distinct permutations of the letters in the word MISSISSIPPI do the 4 I's not some together?

32. Find the term independent of x in the expansion of $\left(\dfrac{3x^2}{2} - \dfrac{1}{3x} \right)^6$.

33. In an AP if $m^t h term$ is n and the $n^t h$ term is m,where $m \neq n$,find the $p^t h$ term.

34. Find the sum of the sequence 8, 88, 888, 8888, . . . To n terms.

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35. Find the centre and the radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$

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36. Find the derivative of $\cos x$ from first principle.

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37. Verify by the method of contradiction that $\sqrt{7}$ is irrational number

38. If E and F are two events such that $P(E) = \dfrac{1}{4}, P(E) = \dfrac{1}{2}$ and $P(E \text{ and } F) = \dfrac{1}{8}$. Find P (not E and not F).

39. One card is drawn from a well shuffled deck of 52 cards.If each outcome is equally likely,calculate the probability that the card will be (a)a diamond.

40. One card is drawn from a well shuffled deck of 52 cards.If each outcome is equally likely,calculate the probability that the card will be (b)not a diamond.

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41. One card is drawn from a well shuffled deck of 52 cards.If each outcome is equally likely,calculate the probability that the card will be (c)a black card.

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42. Define modulus function, draw the graph of it, write its domain and range.

43. Prove that $\cos^2 + x + \cos^2\left(x + \dfrac{\pi}{3}\right) + \cos^2\left(x - \dfrac{\pi}{3}\right) = \dfrac{3}{2}$ and hence find the values of $\sin^2 x + \sin^2\left(x + \dfrac{\pi}{3}\right) + \sin^2\left(x - \dfrac{\pi}{3}\right)$

44. $1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + n^2 = \dfrac{n(n+1)(2n+1)}{6} \ \forall n \in N.$

45. Solve the following system of inequalities graphically :

$$5x + 4y \leq 20, \, x \geq 1, \, y \geq 2$$

46. A group consists of 5 girls and 7 boys.In how many ways can a team of 5 members be selected if the team has atleast one boy and one girl.

47. State and prove Bionomial theorem for any positive integer n.

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48. Find the equation of the line, which makes intercepts -3 and 2 on the

x - and y- axes respectvely.

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49. Derive the formula for the distance between two points (x_1, y_1, z_1) and (x_2, y_2, z_2) and hence find the distance between P(1,-3,4) and Q(-4,1,2).

50. Prove that $\lim\limits_{x \to 0} \dfrac{\sin x}{x} = 1$,where x is in radian and hence evaluate: $\lim\limits_{x \to 0} \dfrac{\sin 4x}{\sin 2x}$.

51. (a)Derive geometrically that $\cos(x + y) = \cos x \cos y - \sin x \sin y$.Hence deduce the valueof $\cos 75^\circ$

52. (b) Find the sum to n terms of the series $1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \ldots$

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53. (a)Define a parabola and derive its equation in the standard form $y^2 = 4ax$

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54. Find the derivative of $\dfrac{x^2 - \cos x}{\sin x}$ with respect to x ?

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