MATHS

BOOKS - OSWAAL PUBLICATION

SAMPLE PAPER 2

Exercise

1. Define power set of a Set.

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2. If set A has three elements and set B={3,4,5} find the nummber of elements of $A \times B$

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3. Convert $40°$, $20'$ into radian measure.

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4. Write the multiplicative inverse of $\dfrac{\sqrt{3}}{2} - \dfrac{1}{2}i$.

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5. Is 3! + 4! = 7!?

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6. What is the 20th term of the sequence defined by

$$a_n = (n-1)(2-n)(3+n)?$$

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7. Find the slope of the line $3x - 4y + 10 = 0$.

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8. Find the derivative of x at $x = 1$.

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9. Write the negation of the statement.

"intersection of two disjoint sets is not an empty set "

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10. A die is rolled.Describe the event "a number less than 7" occurs.

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11. Let A and B be two sets such that n(A)=3 and n(B)=2,If (5,a),(6,b), (7,a) are in $A \times B$ then find the sets A and B,Where a,b are distinct elements.

12. If A={2,5,7,9,11},B={7,9,11,13} and C={11,13,15},then find $A \cap (B \cup C)$

13. If X and Y are two sets such that $X \cup Y$ has 18 elements, X has 8 elements and Y has 15 elements , how many elements does $X \cap Y$ have?

14. Find the value of $\sin\left(\dfrac{31\pi}{3}\right)$.

15. Prove that: $\cos 3x = 4\cos^3 x - 3\cos x$

16. Show that (-1,2,1),(1,-2,5),(4,-7,8) and(2,-3,4) are the vertices of parallelogram.

17. Express $\dfrac{\left(3+\sqrt{2}i\right)\left(3-\sqrt{2}i\right)}{(5-2i)-(5+2i)}$ in the form of $a+ib$.

18. The marks obtained by a student of Class XI in 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.

19. Find the equation of the line, which makes intercepts -3 and 2 on X and Y-axes respectively.

20. Find the equation of the line passing through $(-3, 5)$ and perpendicular to the line through the points $(2, 5)$ and $(-3, 6)$.

21. Evaluate: $\lim\limits_{x \to 0} \dfrac{ax + x \cos x}{b \sin x}$.

22. Write the contrapositive and converse of "If a paralleogram is a square,then it is a rhombus".

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

24. A coin is tossed 3 times.Events A and B are, A: no head appears,B:No tail appears.Show that A and B are mutually exclusive.

25. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products A and B, 12 people liked products C and A, 14 people liked products B and C and 8 liked all the three products. Find how many liked product C only.

26. If A={1,2,3,4},B={5,6}.Define a relation R from A to B by $R = \{(x, y) : x \in A, y \in B, x - y\, is\, odd\}$.Write R in the roaster form.Write down its domain and range.

27. If $\sin x = \dfrac{3}{5}$, $\cos y = -\dfrac{12}{13}$, where x and y both lie in second quadrant, find the vlaue of $\sin(x + y)$.

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28. Convert $\dfrac{1 + i\sqrt{3}}{2}$ into polar form.

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29. $27x^2 - 10x + 1 = 0$

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30. Find the number of arrangements of the letters of the word PERMUTATIONS.In how many of these arrangements (i) word start with P and ends with S

31. In how many ways can the letters of the word 'PERMUTATIONS '

be arranged if the vowels are all together?

32. Expand $\left(x^2 + \left(\dfrac{3}{5} \right) \right)^5, x \neq 0.$

33. How many terms of the G.P.3, $\dfrac{3}{2}, \dfrac{3}{4}$ ....are needed to give the sum $\dfrac{3069}{512}$?

34. If the pth, qth and rth terms of a G.P. are , l,m,n respectively , then $l^{q-r}m^{r-p}n^{p-q}$ is :

35. Find the equation of circle which passes through(1,0) and(0,-1) and whose centre lies on the line $x - y + 2 = 0$.

36. Differentiate of $\cos x$ w.r.t. x from first principles

37. By the method of contrapositive, check the validity of the statement: " If a, b in Z` such that ab is odd, then both 'a' and 'b' are

odd".

38. A and B are events such that P(A) =0.42,P(B) =0.48 and P(A and B) =0.16 Determine (i) P(not A) ,(ii) P(not B) ,(iii) P (A or B)

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41. 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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43. Define an identity function . Draw the graph of identify function and write Domain and Ranges ?

44. $\dfrac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

45.
$\dfrac{1}{1.2} + \dfrac{1}{2.3} + \dfrac{1}{3.4} + \ldots\ldots\ldots\ldots\ldots + \dfrac{1}{n(n+1)} = \dfrac{n}{n+1} \ \forall n \in N.$

46. Solve the inequalities :$2x + 3y \le 12, \ x \ge 2, \ y \ge 2$ graphically.

47. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of

(i) exactly 3 girls

(ii) atleast 3 girls?

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50. Show that the middle term in the expansion of $(1 + x)^{2n}$ is 1.3.5...(2n-1)/n! $2n$. x^n, where n is a positive integer.

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51. Derive the equation of a straight line passing through the point (x_0, y_0) having the slope m.Hence deduce the equation of a line

which passing through(2,1)which makes an angle $45°$ with positive direction of x-axis.

52. Prove that $\lim\limits_{x \to 0} \left(\dfrac{\sin x}{x} = 1 \right)$?

53. Find the mean deviation about the mean for the following data:

Marks Obtained	0–10	10–20	20–30	30–40	40–50	50–60
Number of girls	6	8	14	16	4	2

54. Prove that geometrically that

$\cos(x + y) = \cos x . \cos y - \sin x . \sin y$ and hence show that

$\cos 2x = \cos^2 x - \sin^2 x$.

55. Find the sum to n terms of the series , 5+11+19+29+41...

56. Define hyperbola as a set of points derive its equation in the form $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$

57. Find the derivative of $\dfrac{x + \cos x}{\tan x}$ with respect to x