MATHS

BOOKS - OSWAAL PUBLICATION

SOLVED PAPER 2018-2

Exercise

1. Define power set of a Set.

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2. If (x+1, y-2)=(3,1), find the values of x and y.

3. Convert 240° into radian measure.

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4. Find the multiplicative inverse of 2-3i.

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5. Compute $\dfrac{12!}{10!2!}$

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6. Find17^{th} term of sequence whosen^{th} term is given by

$a_n = 4n - 3$?

7. Find the slope of the time passing through the points

(3,-2) and (-1,4)

8. Evaluate $\lim\limits_{x \to 0} \dfrac{ax + b}{cx + 1}$

9. Write the negation of statement $\sqrt{2}$ is not a complex number.

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10. A coin tossed and a die thrown.Write the sample space.

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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 S and T are two sets such that S has 21 elements, T has 32 elements, and $S \cap T$ has 11 elements, how many elements does $S \cup T$ have?

13. Let A={1,2} and B={3,4}. Write $A \times B$. How many subsets will $A \times B$ have? List them.

14. Find the value of $\sin 75°$.

15. Find the general solution of $2\sin x + \sqrt{3} = 0$

16. Express $\dfrac{\left(3 + i\sqrt{5}\right)\left(3 - i\sqrt{5}\right)}{\left(\sqrt{3} + i\sqrt{2}\right) - \left(\sqrt{3} - i\sqrt{2}\right)}$ in the from a +

ib.

17. Solve $7x + 3 < 5x + 9$. Show the graph of the solution

on number line.

18. Find the equatin of the straight line with slope m and passing through the point (x1,y1)

19. Reduce the equation $3x + 2y - 12 = 0$ into intercept form and find its intercepts on the axes.

20. Show that the points $A(-2, 3, 5), B(1, 2, 3)$ and $C(7, 0, -1)$ are collinear.

21. Evaluate $\lim\limits_{x \to 1} \dfrac{x^{15} - 1}{x^{10} - 1}$.

22. Write the converse and contrapositive of " if a number is divisible by 9 then its is divisible by 3"

23. An analysis of monthly wages paid to workers in two firms A and B belonging to the same industry gives the following results.

	Firm A	Firm B
No.of wage earners	586	648
Mean of monthly wages	Rs.5253	Rs.5253
Variance of distribution of wages	100	121

(i) Which firm A or B pays larger amount as monthly wages ?

(ii) Which firm A or B shows greater variability in individual wages .

24. 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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26. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?

27. Let A={1,2,3,4,6}. Let R be the relation on A defined by

$\{\{a, b) : a, b \in A$, b is exactly divisible by a}.

(i) Write R in roster form, (ii) Find the domain of R, (iii) Find the range of R.

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

31. Represent the complex number $Z = \dfrac{1}{1+i}$ in the polar form.

32. Solve $\sqrt{5}x^2 + x + \sqrt{5} = 0$

33. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements (i) do the word start with P (ii) do all the vowels always occur together.

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35. Find the middle term in the expansion of $\left(\dfrac{x}{3} + 9y\right)^{10}$

36. Insert five numbers between 8 and 26 such that the resulting sequence is in AP.

37. Find the sum of the sequence 7,77,777,7777,........n terms

38. Find the equation of the parabola which is symmetric about y-axis, and passes through the point $(2, \ -3)$.

39. Find the derivative of (tanx) w.r.t x from first principal method ?

40. Veryfy by the method of contradiction that $\sqrt{7}$ is an irrational

41. A bag contains 9 discs of ehich 4 are red,3 are blue and 2 are yellow.The discs are similar in shape and size.A disc is

drawn at random from the bag.Calculate the probability that it will be(i)red.

42. A bag contains of discs of which are red ,3 are blue and 2 are yellow .The discs are similar in shape and size .A disc is drawn at random from the bag .Calculate the probability that it will be (i) red (ii) not blue ?

43. A bag contains 9 discs of which 4 are red 3 are blue and 2 are yellow.The discs are similar in shape and size.The disc

is drawn at random from the bag.Calculate the probability that the disc drawn will be(iii) either red or blue.

44. A die is thrown. Find the probability that

(i) A prime number will appear.

(ii) A number greater than or equal to 3 will appear.

(iii) A number more than 6 will appear.

45. A die is thrown.Write the sample space.Also find the probability of the event"A number greater than or equal to 3 will appear".

46. A die is thrown, find the probability of following events:

(i) A prime number will appear,

(ii) A number les than or equal to 3 will appear,

(iii) A number les than or equal to one will appear,

(iv) A number more than 6 will appear,

(v) A number les than 6 will appear.

47. Define a modulus function . Draw its graph. Also write down its domain and range.

48. $\dfrac{(\sin 7x + \sin 5x) + (\sin 9x + \sin 3x)}{(\cos 7x + \cos 5x) + (\cos 9x + \cos 3x)} = \tan 6x$

49.

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

50. Solve the following system of inequalities graphically

$x + 2y \le 8, \ 2x + y \le 8, \ x \ge 0, \ y \ge 0.$

51. What is the number of ways of choosing 4 cards from a

pack of 52 playing cards? In how many of these

(i) four cards are of the same suit,

(ii) four cards belong to four different suits,

(iii) are face cards,

(iv) two are red cards and two are black cards,

(v) cards are of the same colour?

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

56. Derive the expression for the length of the perpendicular drawn from the point (x_1, y_1) yo the line $ax + by + c = 0$

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

58. Find the mean deviation about median for the following data:

Marks Obtained	0-10	10-20	20-30	30-40	40-50	50-60
No. of girls	6	8	14	16	4	2

59. (a)Derive geometrically that

$\cos(x + y) = \cos x \cos y - \sin x \sin y$.Hence deduce the

valueof $\cos 75°$

60. (b) Find the sum to n terms of the series

$1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \dots$

61. Find the equation of hyperbola in the form

$\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$, given that length of transverse axis = 10 and eccentricity = 2.

62. Find the derivative of $f(x) \dfrac{x + \cos x}{\tan x} w. r.$ to x ...

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