

DINESH TUITION CENTER,
(Opposite Aanandh Jewellery)
19, Paalayam Bazaar, Woraiyur, Trichy

10th Standard
Mathematics

Quarterly Model Question Paper
2022-2023

Classes in Youtube: Dinesh Centum Maths

Website: dineshcentummaths.blogspot.com

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Quarterly Model Question Paper 2022.

Standard - 8

Time : 3 hrs 15 mins.

MATHEMATICS

Total Mark : 100

I

PART - I

Choose the correct answer :

$14 \times 1 = 14$

1. $A = \{a, b, p\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$

then $n[(A \cup C) \times B]$ is

- (A) 8 (B) 20 (C) 12 (D) 16.

2. If $\{(a, 8), (b, b)\}$ represents an identity function, then the value of a and b are respectively

- (A) $(8, b)$ (B) $(8, 8)$ (C) $(b, 8)$ (D) (b, b)

3. Let $f(x) = \sqrt{1+x^2}$ then.

- (A) $f(xy) = f(x) \cdot f(y)$ (B) $f(xy) \geq f(x) \cdot f(y)$
(C) $f(xy) \leq f(x) \cdot f(y)$ (D) None of these

4. $7^{4k} \equiv \underline{\hspace{2cm}} \pmod{100}$

- (A) 1 (B) 2 (C) 3 (D) 4.

5. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is

- (A) 3 (B) 5 (C) 8 (D) 11.

6. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$ is

- (A) $\frac{1}{24}$ (B) $\frac{1}{27}$ (C) $\frac{2}{3}$ (D) $\frac{1}{81}$

7. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is

- (A) $\frac{9y}{7}$ (B) $\frac{9y^3}{(21y-21)}$ (C) $\frac{21y^2-42y+21}{3y^3}$ (D) $\frac{7(y^2-2y+1)}{y^2}$

8. The solution of the system $x+y-3z = -6$,

$$-7y + 7z = 7, \quad 3z = 9 \text{ is}$$

- (A) $x=1, y=2, z=3$ (B) $x=-1, y=2, z=3$
 (C) $x=-1, y=-2, z=3$ (D) $x=1, y=-2, z=3$.

9. If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when

- (A) $\angle B = \angle E$ (B) $\angle A = \angle D$ (C) $\angle B = \angle D$ (D) $\angle A = \angle F$

10. If $\triangle ABC$ is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5\text{ cm}$, then AB is.

- (A) 2.5 cm (B) 5 cm (C) 10 cm (D) $5\sqrt{2}$ cm.

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11. If $(5, 7)$, $(3, p)$ and $(6, 6)$ are collinear, then the value of p is
 (A) 3 (B) 6 (C) 9 (D) 12.
12. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is.
 (A) $\sqrt{3}$ (B) $-\sqrt{3}$ (C) $\frac{1}{\sqrt{3}}$ (D) 0.
13. $\tan \theta \operatorname{cosec}^2 \theta - \tan \theta$ is equal to
 (A) $\sec \theta$ (B) $\cot \theta$ (C) $\sin \theta$ (D) $\cot \theta$.
14. If $x = a \tan \theta$ and $y = b \sec \theta$ then
 (A) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (B) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (C) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (D) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

II

PART - II (MARK : 20)

10 x 2 = 20

Answer any 10 questions :- (Question number 28 is compulsory).

15. If $A \times B = \{(3, 2), (3, 4), (5, 2), (5, 4)\}$ then find A and B .
16. Let $A = \{1, 2, 3, 4, \dots, 45\}$ and R be the relation defined as "is square of a number" on A . Write R as a subset of $A \times A$. Also, find the domain and range of R .

17. Can the number 6^n , n being a natural number end with the digit 5? Give reason for your answer.

18. Solve $5x \equiv 4 \pmod{6}$

19. If $1 + 2 + 3 + \dots + n = 666$ then find n .

20. $4x^2y$, $8x^3y^2$. Find the LCM of the expression.

21. Find the excluded values of the expression.

$$\frac{7P + 2}{8P^2 + 13P + 5}$$

22. In $\triangle ABC$, D and E are points on the sides AB and AC respectively such that $DE \parallel BC$ if

$$AD = 8x - 7, \quad DB = 5x - 3, \quad AE = 4x - 3 \quad \text{and}$$

$$EC = 3x - 1, \quad \text{find the value of } x.$$

23. A man goes 18 m due east and then 24 m due north. Find the distance of his current position from the starting point?

24. What is the slope of a line whose inclination is 30° ?

25. Find the equation of a line through the given pair of point. $(2, \frac{2}{3})$ and $(-\frac{1}{2}, -2)$.

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26. Prove that $1 + \frac{\cot^2 \theta}{1 + \operatorname{cosec} \theta} = \operatorname{cosec} \theta$
27. Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}$ m.
28. Define : Horizontal line test

PART- III (MARKS: 50)

10x5 = 50

11 Answer any 10 questions :- (Question no: 42 is compulsory).

29. Given $A = \{1, 2, 3\}$, $B = \{2, 3, 5\}$, $C = \{3, 4\}$ and $D = \{1, 3, 5\}$, check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?
30. Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ be two sets. Let $f: A \rightarrow B$ be a 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.
31. If $f(x) = \frac{x-1}{x+1}$, $x \neq -1$ show that $f(f(x)) = -\frac{1}{x}$, provided $x \neq 0$.

32. The sum of the first n , $2n$ and $3n$ terms of an A.P are S_1 , S_2 and S_3 respectively.

Prove that $S_3 = 3(S_2 - S_1)$

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

34. Solve the following system of linear equation in three variables $3x - 2y + z = 2$; $2x + 3y - z = 5$; $x + y + z = 6$.

35. If $A = \frac{x}{x+1}$, $B = \frac{1}{x+1}$, prove that

$$\frac{(A+B)^2 + (A-B)^2}{A \div B} = \frac{2(x^2 + 1)}{x(x+1)^2}$$

36. Two poles of height ' a ' metres and ' b ' metres are ' p ' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\frac{ab}{a+b}$ metres.

37. State and prove : Thales Theorem.

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

39. 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 $(-7, 6)$

40. Prove that $\tan^2 A - \tan^2 B = \frac{\sin^2 A - \sin^2 B}{\cos^2 A \cos^2 B}$

41. A statue 1.6 m tall stands on top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 40° . Find the height of the pedestal. ($\tan 40^\circ = 0.8391$, $\sqrt{3} = 1.732$).

42. Find the sum of first n terms of the series $7 + 77 + 777 + \dots$

PART - IV (MARKS: 16)

$2 \times 8 = 16$

IV Answer both questions :-

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$). (OR)

b) Construct a triangle ΔPQR such that $QR = 5\text{ cm}$, $\angle P = 30^\circ$ and the altitude from P to QR is of length 4.2 cm .

44. a). A bus is travelling at a uniform speed of 50 km/hr . Draw the distance - time graph and hence find

- (i) the constant of variation.
- (ii) how far will it travel in $1\frac{1}{2}$ hour.
- (iii) the time required to cover a distance of 300 km from the graph.

(or)

b) Draw the graph of $xy = 24$, $x, y > 0$.

Using the graph find,

- (i) y when $x = 3$.
- (ii) x when $y = 6$.

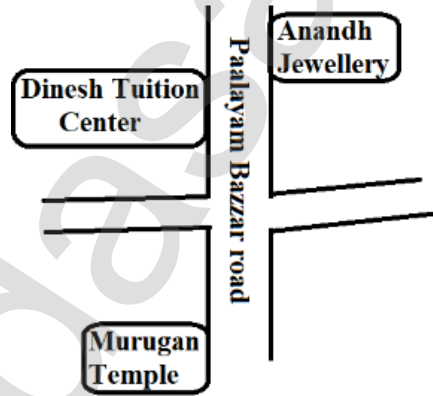


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