Sri Raghavendra Tuition Center

HALF PORTION TEST - 1,2,3,4

10th Standard

Maths

Date : 07-11-24

Reg.No. : | | | | | | |

Exam Time : 03:00 Hrs

Total Marks : 100

T

EACHER NAME: P.DEEPAK M.Sc.,M.A.,B.Ed.,DCA.,TET-1.,TET-2.,

PHONE NUMBER : 9944249262

EMAIL: darthi99ktp@gmail.com

பகுதி - I/PART-1 14 x 1 = 14

குறிப்பு :

(i) அனைத்து வினாக்களுக்கும் விடையளிக்கவும்.

(ii) கொடுக்கப்பட்டுள்ள மாற்று விடைகளில் மிகவும் ஏற்புடைய விடையினைத் தேர்ந்தெடுத்துக் குறியீட்டுடன் விடையினையும் சேர்த்து எழுதவும்.

Note:

(i) Answer all the questions.

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1) If the ordered pairs (a + 2, 4) and (5, 2a + b) are equal then (a, b) is

(a) (2,-2) (b) (5,1) (c) (2,3) (d) (3,-2)

2) If f: A ⟶ B is a bijective function and if n(B) = 7, then n(A) is equal to

(a) 7 (b) 49 (c) 1 (d) 14

3) $f(x) = (x + 1)^3 - (x - 1)^3$ represents a function which is

(a) linear (b) cubic (c) reciprocal (d) quadratic

4) In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120?

(a) 6 (b) 7 (c) 8 (d) 9

5) If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + ... + 2^0$ Which of the following is true?

(a) B is 2^{64} more than A (b) A and B are equal (c) B is larger than A by 1 (d) A is larger than B by 1

6) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, ...$ 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) $\frac{9y^2}{(21y-21)}$ (c) $\frac{21y^2-42y+21}{3y^2}$ (d) $\frac{7(y^2-2y+1)}{y^2}$

8) $y^2 + \frac{1}{y^2}$ is not equal to

(a) $\frac{y^2+1}{y^2}$ (b) $\left(y+\frac{1}{y}\right)^2$ (c) $\left(y-\frac{1}{y}\right)^2+2$ (d) $\left(y+\frac{1}{y}\right)^2-2$

9) If A = $\begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and C = $\begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$, Which of the following statements are correct?

(i) AB + C = $\begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

(ii) BC = $\begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$

(iii) BA + C = $\begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

(iv) (AB)C = $\begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) all of these

10) 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) $\angle A = \angle F$

11) In ΔLMN, ∠L = 60°, ∠M = 50°. If ΔLMN ~ ΔPQR then the value of ∠R is

(a) 40° (b) 70° (c) 30° (d) 110°

12) The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB$ = 70° then the value of $\angle AOB$ is

(a) 100° (b) 110° (c) 120° (d) 130°

13) The common differences of the A.P. $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$,...is

(a) $\frac{1}{3}$ (b) $\frac{-1}{3}$ (c) - b (d) b

14) The GCD of $10(x^2 + x - 20)$, $15(x^2 - 3x - 4)$ and $20(x^2 + 2x + 1)$ is _____

(a) 5(x - 4) (b) 5 (c) 5(x + 1) (d) 5(x + 1) (x - 1)

பகுதி - II/PART - II

10 x 2 = 20

குறிப்பு : எவையேனும் 10 வினாக்களுக்கு விடையளிக்கவும். வினா எண் 28 -க்கு கட்டாயமாக விடையளிக்கவும்.

Note : Answer any 10 questions. Compulsorily answer question number 28.

15) If A x B = {(3,2), (3, 4), (5,2), (5, 4)} then find A and B.

16) Let f(x) = 2x + 5. If x ≠ 0 then find $\frac{f(x+2)-f(2)}{x}$.

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

18) 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.

19) Solve $5x \equiv 4 \pmod 6$

20) Today is Tuesday. My uncle will come after 45 days. In which day my uncle will be coming?

21) Solve $x^2 - 3x - 2 = 0$

22) Find the excluded values of the following expressions (if any).

$\frac{x}{x^2+1}$

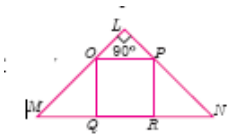
23) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of $\alpha^3 - \beta^3$

24) In △ABC, D and E are points on the sides AB and AC respectively. For each of the following cases show that DE||BC

AB = 12 cm, AD = 8 cm, AE = 12 cm and AC = 18 cm.

25) A tangent ST to a circle touches it at B. AB is a chord such that ∠ABT= 65°. Find ∠AOB, where "O" is the centre of the circle.

26) If figure OPRQ is a square and ∠MLN=90°. Prove that

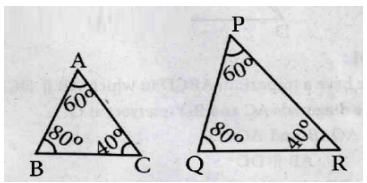


△LOP~△RPN

27) Let a function f : R→ A be defined as $f(x) = \begin{cases} 1, & \text{if } x \text{ is rational} \\ -1, & \text{if } x \text{ is irrational , where } x \in R \end{cases}$

Find $f\left(\frac{1}{3}\right)$ and $f(\sqrt{5})$

28) Check whether the given pair of triangles are similar or not



பகுதி - III/PART - II 10 x 5 = 50

குறிப்பு :

எவையேனும் 10 வினாக்களுக்கு விடையளிக்கவும். வினா எண் 42 -க்கு கட்டாயமாக விடையளிக்கவும்.

Note:

Answer any 10 questions. Compulsorily answer question number 42.

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

30) Let A = {x ∈ W| x < 2}, B = {x ∈ N| 1 < x ≤ 4} and C = (3,5). Verify that
(A U B) x C = (A x C) U (B x C)

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

32) Find the sum of the Geometric series 3 + 6 + 12 + ...+ 1536

33) Use Euclid's Division Algorithm to find the Highest Common Factor (HCF) of
10224 and 9648

34) Find the sum of
$5^2 + 10^2 + 15^2 + ... + 105^2$

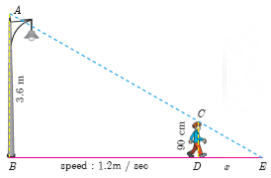
35) In a three-digit number, when the tens and the hundreds digit are interchanged the new number is 54 more than three times the original number. If 198 is added to the number, the digits are reversed. The tens digit exceeds the hundreds digit by twice as that of the tens digit exceeds the unit digit. Find the original number.

36) Solve the following system of linear equations in three variables 3x – 2y + z = 2, 2x + 3y – z = 5, x + y + z = 6.

37) Let 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
A(BC) = (AB)C

38) Simplify
$\frac{b^2+3b-28}{b^2+4b+4} \div \frac{b^2-49}{b^2-5b-14}$

39) A boy of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamppost is 3.6m above the ground, find the length of his shadow cast after 4 seconds.



40) A man whose eye-level is 2 m above the ground wishes to find the height of a tree. He places a mirror horizontally on the ground 20 m from the tree and finds that if he stands at a point C which is 4 m from the mirror B, he can see the reflection of the top of the tree. How height is the tree?

41) A function f: [-5,9] ⟶ R is defined as follows:

$$f(x) = \begin{cases} 6x+1 & \text{if } -5 \le x < 2 \\ 5x^2-1 & \text{if } 2 \le x < 6 \\ 3x-4 & \text{if } 6 \le x \le 9 \end{cases}$$

Find

i) f(-3) + f(2)

ii) f(7) - f(1)

iii) 2f(4) + f(8)

iv) $\frac{2f(-2)-f(6)}{f(4)+f(-2)}$

42) Let A = {1,2,3,4} and B = { 2, 5, 8, 11,14} be two sets. Let f: A ⟶ 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

பகுதி - IV/PART - IV 2 x 8 = 16

Note:

Answer all the questions.

குறிப்பு :

அனைத்து வினாக்களுக்கும் விடையளிக்கவும்.

43) a) Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$

(OR)

b) A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below.

Number of workers (x)	40	50	60	75
Number of days (y)	150	120	100	80

(i) Graph the above data and identify the type of variation.

(ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?

(iii) If the work has to be completed by 200 days, how many workers are required?

44) a) Construct a △ABC such that AB = 5.5 cm, ∠C = 25º and the altitude from C to AB is 4 cm.

(OR)

b) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.

ALL THE BEST

****