

**PERIODIC TEST - II (2023-24)**  
**SUBJECT - MATHEMATICS (041)**  
**CLASS - X**

**Time allowed : 3 Hrs**

**Maximum Marks - 80**

**GENERAL INSTRUCTIONS :**

1. This Question paper has 5 Sections A-E.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 case based integrated units of assessment (4 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Qs of 2 marks has been provided. An internal choice has been provided in the 2 Marks questions of Section E.
8. Draw neat figures whenever required.

**SECTION - A [20 × 1 = 20 marks]**

**Section A consists of 20 questions of 1 mark each.**

(1) What is the HCF of 3000 and 525

- a) 75  
c) 55

- b) 25  
d) 35

(2) On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm respectively. The minimum distance each should walk, so that each can cover the same distance in complete step is :

- a) 2250 m  
c) 2550 m

- b) 2520 m  
d) 2050 m

(3) For what value of k, the roots of the equation  $3x^2 - 10x + k = 0$  are reciprocal each other ?

- (a) 3  
(c)  $\frac{10}{3}$

- (b) 10  
(d)  $\frac{1}{3}$

(4) If the  $n^{\text{th}}$  term of A.P. 12, 15, 18, ..... 99 is 99. Then value of n is equal to

- (a) 20  
(c) 30

- (b) 40  
(d) 35

(5) The co-ordinates of a point A, where AB is the diameter of the circle with centre (-2,2) and B is point with coordinates (3,4) is :

- (a) (7,0)  
(c) (5,0)

- (b) (-7,0)  
(d) (-5,0)

(6) The centre of a circle whose end points of a diameter are (-6,3) and (6,4) is :

- (a) (8, -1)  
(c)  $(0, \frac{7}{2})$

- (b) (4,7)  
(d)  $(4, \frac{7}{2})$

(7) The coordinates of the point which is reflection of point (-3,5) in x-axis are :

- (a) (3,5)  
(c) (-3, -5)

- (b) (3, -5)  
(d) (-3,5)

(8) If the system of equations  $3x + y = 1$  and  $(2k - 1)x + (k - 1)y = 2k + 1$  is inconsistent, then k is

- (a) -1  
(c) 1

- (b) 0  
(d) 2

(19) Assertion (A): If the zeroes of a quadratic polynomial  $ax^2 + bx + c$  are both positive, then  $a, b$  and  $c$  all have the same sign.

Reason (R): If two of the zeroes of a cubic polynomial are zero, then it does not have linear and constant terms.

(20) Assertion (A): If  $n^{\text{th}}$  term of an A.P. is  $(2n + 1)$ , then the sum of its first three terms is 15.

Reason (R): The sum of first 16 terms of the A.P. 10, 6, 2, ..... is - 320.

**SECTION - B [5 × 2 = 10 marks]**

Section B consists of 5 questions of 2 marks each.

(21) Find the 4<sup>th</sup> term from the end of the A.P. : - 11, - 8, - 5, ..... 49

Or

For what value of  $k$  will be  $(k + 9)$ ,  $(2k - 1)$  and  $(2k + 7)$  are consecutive terms of an A.P.

(22) Sumit is 3 times as old as his son. Five years later, he shall be two and a half times as old as his son. How old is Sumit at present?

(23) Point A lies on the line segment XY joining X (6, - 6) and Y (-4, - 1) in such a way that  $\frac{XA}{XY} = \frac{2}{5}$ . If point A also lies on the line  $3x + k(y + 1) = 0$ , find the values of  $k$ .

(24) Find the value of  $m$  for which the quadratic equation  $(m - 1)x^2 + 2(m - 1)x + 1 = 0$  has two real and equal roots.

(25) Which term of the A.P. 3, 8, 13, 18, ..... is 88 ?

Or

Which term of the A.P. : 121, 117, 113, ..... is its first negative term ?

**SECTION - C [6 × 3 = 18 marks]**

Section C consists of 6 questions of 3 marks each.

(26) Prove that  $\sqrt{2}$  is an irrational number.

(27) If  $m^{\text{th}}$  term of an A.P. is  $\frac{1}{n}$  and  $n^{\text{th}}$  term is  $\frac{1}{m}$ , find the sum of first  $mn$  terms.

OR

How many terms of an A.P. 9, 17, 25, ..... must be taken to give a sum of 636 ?

(28) What point on the x-axis is equidistant from (7, 6) and (-3, 4) ?

Or

Find a point on the y - axis which is equidistant from the points A (6, 5) and B (-4, 3).

(29) If  $\alpha, \beta$  are zeroes of quadratic polynomial  $5x^2 + 5x + 1$ , find the value of

A)  $\alpha^2 + \beta^2$

B)  $\alpha^{-1} + \beta^{-1}$

(30) Find the value of  $k$  so that quadratic equation  $kx(x - 2) + 6 = 0$  have two equal roots.

(31) Find how many integers between 200 and 500 are divisible by 8.

**SECTION - D [4 × 5 = 20 marks]**

Section D consists of 4 questions of 5 marks each.

(32) ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each other at the point O. Prove that

$$\frac{AO}{OC} = \frac{BO}{OD}$$

Or

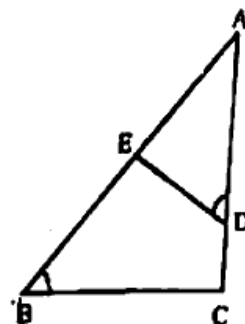
State and Prove Basic Proportionality Theorem.

(33) In figure, A, B and C are points on OP, OQ and OR respectively such that  $AB \parallel PQ$  and  $AC \parallel PR$ . Show that  $BC \parallel QR$ .

(9) If  $\alpha, \beta$  are the zeroes of the quadratic polynomial  $p(x) = x^2 - (k+6)x + 2(2k-1)$ , then the value of  $k$ , if  $\alpha + \beta = \frac{1}{2}\alpha\beta$ , is

- (a) -7 (b) 7  
(c) -3 (d) 3

(10) In the given figure, if  $\angle ADE = \angle B$ , show that  $\triangle ADE \sim \triangle ABC$ . If  $AD = 3.8$  cm,  $AE = 3.6$  cm,  $BE = 2.1$  cm,  $BC = 4.2$  cm, find DE.



- (a) 2.8 cm (b) 3.8 cm  
(c) 1.8 cm (d) 4.8 cm

(11) A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

- (a) 42 m (b) 32 m  
(c) 28 m (d) 36 m

(12) The nature of roots of the Quadratic equation  $9x^2 - 6x - 2 = 0$  is:

- (a) No real roots (b) 2 equal real roots  
(c) 2 distinct real roots (d) More than 2 real roots

(13) What is the ratio in which the line segment joining (2, -3) and (5, 6) is divided by x-axis?

- (a) 1:2 (b) 2:1  
(c) 2:5 (d) 5:2

(14) If two positive integers  $a$  and  $b$  are written as  $a = x^3y^2$  and  $b = xy^3$ , where  $x, y$  are prime numbers. then the result obtained by dividing the product of the positive integers by the LCM ( $a, b$ ) is

- (a)  $xy$  (b)  $xy^2$   
(c)  $x^3y^3$  (d)  $x^2y^2$

(15) The exponent of 2 in the prime factorisation of 484 is: <https://www.cbseboardonline.com>

- (a) 1 (b) 2  
(c) 3 (d) 4

(16) The quadratic polynomial whose sum and product of the zeroes are  $\frac{21}{8}$  and  $\frac{5}{16}$  respectively is:

- (a)  $\frac{1}{4}(4x^2 - 12x + 5)$  (b)  $\frac{1}{16}(16x^2 - 42x + 5)$   
(c)  $\frac{1}{8}(x^2 - 42x + 5)$  (d) None of these

(17) Two APs have the same common difference. The first term of one of these is -1 and that of the other is -8. The difference between their 4th terms is

- (a) 1 (b) -7  
(c) 7 (d) 9

(18) A point  $(x, y)$  is at a distance of 5 units from the origin. How many such points lie in the third quadrant?

- (a) 0 (b) 1  
(c) 2 (d) infinity

**DIRECTION :** In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose correct option.

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)  
(B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).  
(C) Assertion (A) is true but reason (R) is false.  
(D) Assertion (A) is false but reason (R) is true.

(i) What will be the distance covered by Ajay's car in two hours?

[ 1 mark ]

(ii) What is the quadratic equation for the speed of Raj's car?

[ 1 mark ]

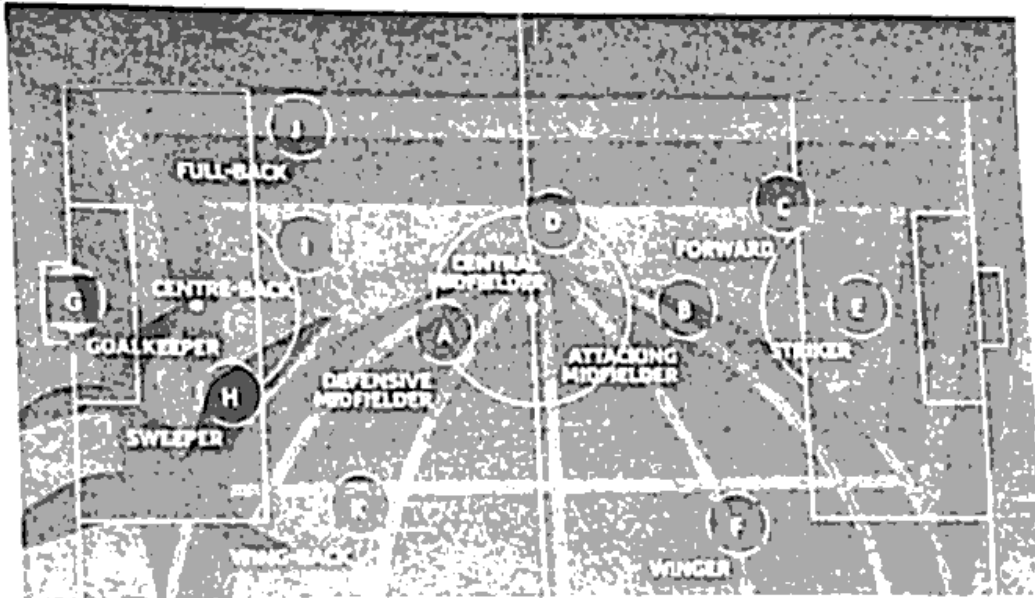
(iii) How much time taken by Ajay to travel 400 km?

[ 2 mark ]

OR

What is the speed of Ajay's car?

(38) Tharunya was thrilled to know that the football tournament is fixed with a monthly timeframe from 20th July to 20th August 2023 and for the first time in the FIFA Women's World Cup's history, two nations host in 10 venues. Her father felt that the game can be better understood if the position of players is represented as points on a coordinate plane.



(i) At an instance, the midfielders and forward formed a parallelogram. Find the position of the central midfielder (D) if the position of other players who formed the parallelogram are :- A(1,2), B(4,3) and C(6,6)

(ii) Check if the Goal keeper G(-3,5), Sweeper H(3,1) and Wing-back K(0,3) fall on a same straight line.

[or]

Check if the Full-back J(5,-3) and centre-back I(-4,6) are equidistant from forward C(0,1) and if C is the mid-point of IJ.

(iii) If Defensive midfielder A(1,4), Attacking midfielder B(2,-3) and Striker E(a,b) lie on the same straight line and B is equidistant from A and E, find the position of E

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