परमाणु ऊर्जा शिक्षण संस्था
Atomic Energy Education Society
टर्म-1/आवधिक परीक्षा-2 2023-24 Term-I/PT-II Examination 2023 - 24

कक्षा / Class : IX   अवधि / Duration : 3 Hrs.

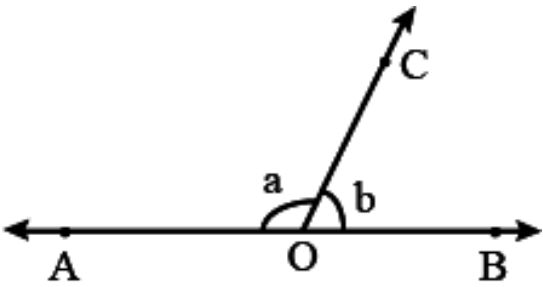विषय / Subject :Mathematics   अधिकतम अंक/ Maximum Marks : 80
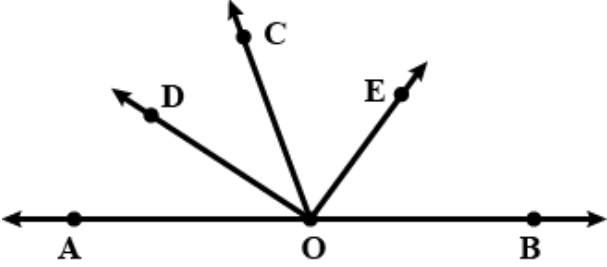
General Instructions:

(i)   This Question paper has 5 Sections A-E.

(ii)   Section-A has 20 MCQs carrying 1 mark each.

(iii)   Section-B has 5 questions carrying 2 marks each.

(iv)   Section-C has 6 questions carrying 3 marks each.

(v)   Section-D has 4 questions carrying 5 marks each.

(vi)   Section-E has 3 case based integrated units of assessment (4 marks each) with sub-parts of the values 1,1and 2 marks.

(vii)   All the Questions are compulsory. However, an internal choice in 2 Questions of 5 marks, 2 Questions of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks Questions of Section E
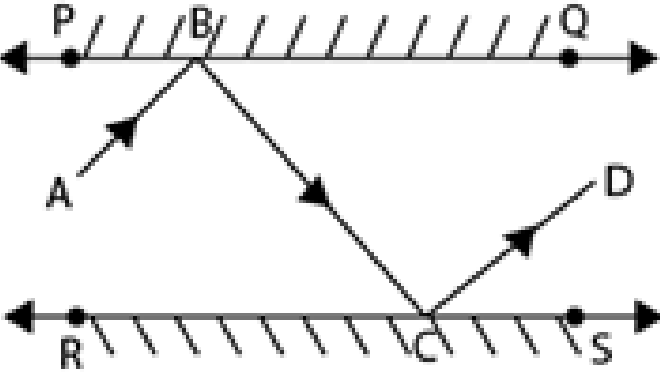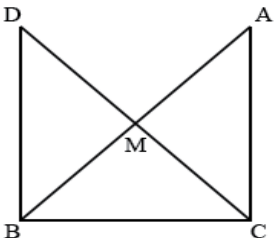
(viii)   Draw neat figures where required.

S.No.	SECTION-A	MARKS
1.	Which of the following is not a rational number? a) $\sqrt{11}$ b)$\sqrt{169}$ c) 0.6972 d) 2.475475	1
2.	$\sqrt{7}$ is a polynomial of degree_____ a) $\frac{1}{2}$ b) 0 c) 1 d) 2	1
3.	Rationalizing factor of $\sqrt{5}$ is: a) $\sqrt{5}$ b) $2\sqrt{5}$ \ c) $3\sqrt{5}$ d) $-3\sqrt{5}$	1
4.	Any point on the x-axis has its y-coordinate __ a) 3 b) 2 c) 1 d) 0	1

5.	If m is a natural number then $\sqrt{m}$ is __ a)Always a natural number b) Always an irrational number c) Always a rational number d) Sometimes a natural number and sometimes an irrational number	1
6.	The zero of a zero polynomial is a) 0 b)1 c) Not defined d) Every real number	1
7.	If the coordinates of a point are (3,-4) , then it lies in : a) First quadrant b) Second quadrant c) Third quadrant d) Fourth quadrant	1
8.	A line segment has _____ end points. a) 1 b) 2 c) 0 d) infinite	1
9.	Postulates are assumed as a) Universal truths in all branches of Mathematics. b) Universal truths specific to Geometry. c) Theorems d) Definitions	1
10.	If one angle of a linear pair is an acute , then its other angle will be : a) An acute b) An obtuse c) A right d) A straight	1
11.	In ΔXYZ if XY=YZ and $\angle Z=80^0$, $\angle X$ will be : a) 80^0 b) 70^0 c) 60^0 d) 50^0	1
12.	What is the distance of a point P(-5,2) from y-axis : a) 2units b) 5 units c) -5 units d) -2 units	1

13.	How many solutions do the linear equations $y = 5x-3$ has a) a unique solution b)only two solutions c) Infinitely many solutions d) no solution	1
14.	Any point on the Y-axis is of the form : a) (x, y) b) (0, y) c) (x, 0) d) (x, x)	1
15.	If one angle of a triangle is equal to the sum of the other two angles, then the triangle is : a) An isosceles triangle b) An obtuse triangle c) An equilateral angle d) A right triangle	1
16.	If AB=QR , BC=RP and CA=PQ , then a) Δ ABC$\cong\Delta$PQR b) ΔCBA$\cong\Delta$PRQ c) ΔBAC$\cong\Delta$RPQ d) ΔPQR$\cong\Delta$BCA	1
17.	An equation of the type $y = mx$ represents a line passing through a) (1,1) b) (2,2) c) (0,0) d) (0,1)	1
18.	The whole is a greater than the part is Euclid's __ axiom a) 5th b) 4th c) 3rd d) 2nd	1
19.	**Assertion:** The sum of two adjacent angles is 100^0 and one of them is 30^0, then the other is 70^0. **Reason:** Adjacent angles are always supplementary. a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion. b) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. c) Assertion is true but the Reason is false. d) Assertion is false but the Reason is true.	1

20.	**Assertion:** 3x - 1 is a linear polynomial. **Reason:** A polynomial of degree 1 is called a linear polynomial. a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion. b) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. c) Assertion is true but the Reason is false. d) Assertion is false but the Reason is true.	1
	SECTION-B	
21.	Find two rational numbers between $\frac{2}{5}$ and $\frac{3}{4}$	2
22.	Solve the equation m-5 = 25 and state the axiom you use here. OR State two of Euclid's axioms.	2
23.	Prove that the lines which are parallel to the same line are parallel to each other.	2
24.	If the corresponding angles of two triangles are equal, then they are not always congruent. Justify it by giving examples. OR It is given that ABC≅ΔDEF. Is it true to say that AB = EF? Justify your answer.	2
25.	In the given figure ∠AOC and ∠BOC form a linear pair. If a-b = 20^0, find the values of a and b. 	2

	SECTION-C	
26.	Represent $\sqrt{3.5}$ geometrically. Or Represent $\sqrt{5}$ on the number line.	3
27.	Express $5.\overline{2}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.	3
28.	Factorise $2x^2-7x-15$ by splitting the middle term. OR Using factor theorem, factorise the polynomial $x^3 + x^2 - 4x - 4$	3

29.	Find the coordinates of the point
	
	   i) Which lies on both x and y- axis.
	   ii) Whose abscissa is 5 and lies on x-axis.
	   iii) Whose ordinate is -4 and lies on y-axis.
		3

30.	Write three solutions of the equation $4x -5y = 15$.	3
31.	In the given figure OD is the bisector of ∠AOC, OE is the bisector of ∠BOC and OD is perpendicular to OE. Show that the points A, O, B are collinear. 	3
	SECTION-D	
32.	If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then find the value of $a^2+ b^2- 4ab$. Or If $x = \frac{2+\sqrt{5}}{2-\sqrt{5}}$, then find the value of $x^2 - y^2$.	5

33.	Factorise the following : a) $27m^3 - \dfrac{1}{216} - \dfrac{9}{2}m^2 + \dfrac{1}{4}m$ b) $2x^2 + y^2 + 8z^2 - 2\sqrt{2}\,xy + 4\sqrt{2}\,yz - 8xz$	5
34.	If PQ and RS are two mirrors placed parallel to each other. an incident ray AB strikes the mirror PQ at B , the reflected rays moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that AB‖CD. OR It is given that $\angle XYZ = 64^0$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find i) $\angle XYQ$ ii) reflex $\angle QYP$.	5
35.	In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B (see the given figure). Show that: (i) $\Delta AMC \cong \Delta BMD$ (ii) $\angle DBC$ is a right angle (iii) $\Delta DBC \cong \Delta ACB$ (iv) $CM = \dfrac{1}{2}AB$	5

SECTION-E

36. Beti Bacho, Beti Padho (BBBP) is a personal campaign of the Government of India that aims to generate awareness and improve the efficiency of welfare services intended for girls.

(i) In a school, group of $(x + y)$ teachers, $(x^2 + y^2)$ girls and $(x^3 + y^3)$ boys organised a campaign on BetiBachao, BetiPadhao. If in the group, there are 10 teachers and 58 girls, then what is the number of boys?

(a) 300

(b) 360

(c) 350

(d) 370

OR

$x^3 - y^3 = ?$

(a) $(x-y) (x^2+xy+y^2)$

(b) $(x-y) (x^2-xy+y^2)$

(c) $(x-y)(x^2+xy-y^2)$

(d) None of these

(ii) Using the information from (i), find $x^2 - y^2$, if $x - y = 2$
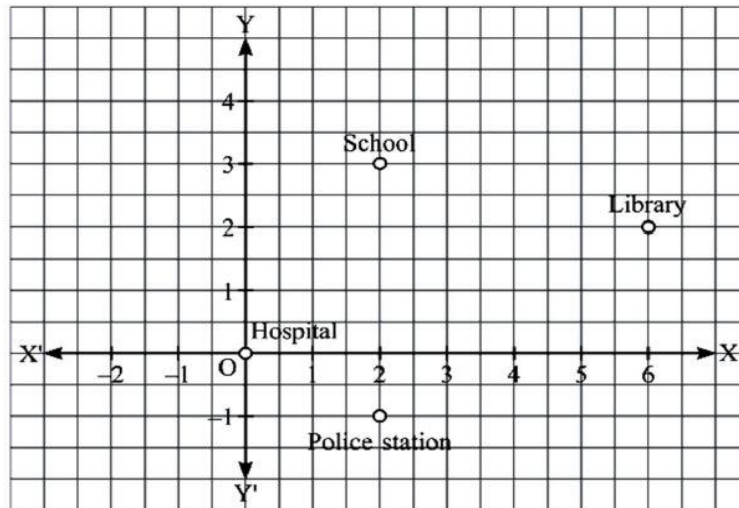
(a) 222

(b) 20

(c) 21

(d) 220

(iii) Which mathematical concept is used here?

(a) Linear equations

b) Triangles

(c) Polynomial

 (d) None of these

2+1+1=4

37.	Deepak bought 3 notebooks and 2 pens for Rs. 80. His friend Ram said that the price of each notebook could be Rs. 25. Then three notebooks would cost Rs.75, the two pens would cost Rs.5 and each pen could be for Rs. 2.50. Another friend Ajay felt that Rs. 2.50 for one pen was too little. It should be at least Rs. 16. Then the price of each notebook would also be Rs.16. Lohith also bought the same types of notebooks and pens as Aditya. He paid 110 for 4 notebooks and 3 pens. Later, Deepak guess the cost of one pen is Rs. 10 and Lohith guess the cost of one notebook is Rs. 30.	
	(i) Form the pair of linear equations in two variables from this situation by taking cost of one notebook as Rs. x and cost of one pen as Rs. y.	
	(a) $3x + 2y = 80$ and $4x + 3y = 110$	
	(b) $2x + 3y = 80$ and $3x + 4y = 110$	
	(c) $x + y = 80$ and $x + y = 110$	
	(d) $3x + 2y = 110$ and $4x + 3y = 80$	1+1+2=4
	(ii) Which is the solution satisfying both the equations formed in (i)?	
	(a) $x = 10, y = 20$	
	(b) $x = 20, y = 10$	
	(c) $x = 15, y = 15$	
	(d) None of these	
	(iii) Find the cost of one pen?	
	(a) Rs. 20	
	(b) Rs. 10	
	(c) Rs. 5	
	(d) Rs. 15	
	OR	
	Find the cost of one notebook?	
	(a) Rs. 20 (b) Rs. 10 (c) Rs. 5 (d) Rs.15	

38.	Aditya is a class IX student residing in a village. One day, he went to a city hospital along with his grandfather for general checkups. From there he visited three places- school, library and police station. After returning to his village, he plotted a graph by taking hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:	
		1+1+2=4

(i) What are the coordinates of school?

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

(ii) What are the coordinates of police station?

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

(iii) Distance between school and police station is :

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

OR

Distance between school and Y-axis is :

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