

PRACTICE TEST : 2019-20

CLASS - X

GMT-II/80

Time : 3.00 Hrs.

SUBJECT : MATHEMATICS

MM : 80

General Instructions :

- (i) All questions are compulsory.
- (ii) The questions paper consists of 40 questions divided into four sections A, B, C and D.
- (iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choices have been provided in few questions
- (v) Use of calculators is not permitted.

SECTION A

Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options.

Q1. Two positive numbers have their HCF as 12 and their product as 6336. The number of pairs possible for the numbers, is

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Q2. If α and β are zeroes and the quadratic polynomial $f(x) = x^2 - x - 4$, then the value of $(1/\alpha + 1/\beta) - \alpha\beta$ is

- (a) $15/4$
- (b) $-15/4$

- (c) 4
- (d) 15

Q3. The 2 digit number which becomes $(5/6)^{\text{th}}$ of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is

- (a) 45
- (b) 54
- (c) 36
- (d) None of these

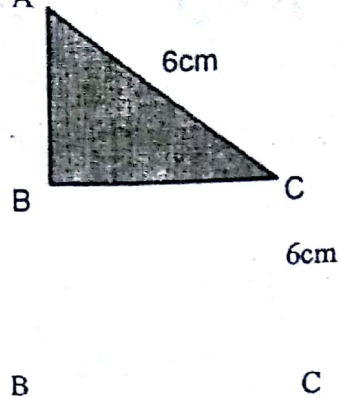
Q4. If one root of the quadratic equation $ax^2 + bx + c = 0$ is the reciprocal of the other, then

- (a) $b = c$
- (b) $a = b$
- (c) $ac = 1$
- (d) $a = c$

Q5. If the common difference of an AP is 5, then what is $a_{18} - a_{13}$?

- (a) 5
- (b) 20
- (c) 25
- (d) 30

Q6. In the adjoining figure, the length of BC is A



[Type text]

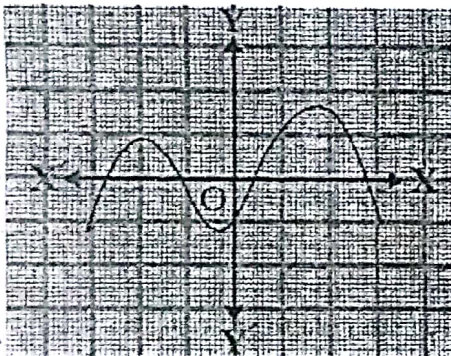
(a) $2\sqrt{3}$ cm

(b) $2\sqrt{3}$ cm

(c) $4\sqrt{3}$ cm

(d) 3 cm

Q7 the graph of $y=p(x)$ is given below



Number of zeros of $y=p(x)$ are

(a) 1

(b) 2

(c) 4

(d) none of three

Q8. The number of terms from 1 to 1000 divisible by 7 are

(a) 142

(b) 143

(c) 144

(d) 141

Q9. If the difference of mode and median of a data is 24, then the difference of median and mean is

- (a) 12 (b) 24
(c) 08 (d) 36

Q10. A bag contains 3 red and 2 blue marbles. If a marble is drawn at random, then the probability of drawing a blue marble is:

- (a) $5/1$ (b) $5/2$
(c) $2/3$ (d) $2/5$

OR

[Type text]

State fundamental theory of arithmetic

(Q.11-Q.15) Fill in the blanks.

Q11. If $a = bq + r$, least value of r is

Q12. Area of a rhombus if its vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ taken in order is

OR

Points $(3, 2)$, $(-2, -3)$ and $(2, 3)$ form a triangle.

Q13. In Triangle ABC , right-angled at B , $AB = 24$ cm, $BC = 7$ cm.

$\sin A = \dots\dots\dots$

Q14. if A and B are acute angles such that $\sin A = \cos B$ then $(A+B)$ is equal to

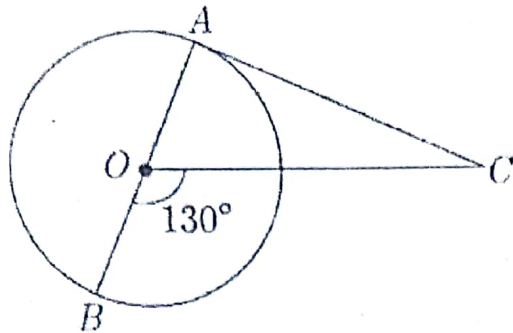
- (a) 60° (b) 90°
(c) 30° (d) 120°

Q15. Mode = $l + (\dots\dots\dots)h$

(Q.16-Q.20) Answer the following

Q16. In any triangle ABC , $DE \parallel BC$. If $AD = 3$ cm, $DB = 4$ cm and $AE = 6$ cm, then find EC .

Q17. In the given figure, AOB is a diameter of the circle with centre O and AC is a tangent to the circle at A . If $\angle BOC = 130^\circ$, then find $\angle ACO$.



Q18. A ladder 15 m long leans against a wall making an angle of 60° with the wall. Find the height of the point where the ladder touches the wall.

OR

An observer, 1.7 m tall, is 20√3 m away from a tower. The angle of elevation from the eye of observer to the top of tower is 30° . Find the height of tower.

Q19. To divide a line segment AB in the ratio 2:5, a ray AX is drawn such that $\angle BAX$ is acute. Then points are marked at equal intervals on AX. What is the minimum number of these points?

Q20. Median = mode +mean

SECTION B

Q21. For what value of k , the pair of linear equations $kx - 4y = 3$, $6x - 12y = 9$ has an infinite number of solutions? [2]

Q22. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from $Q(2, -5)$ and $R(-3, 6)$, find the coordinates of P . [2]

Q23. Find the altitude of an equilateral triangle when each of its side is 'a' cm. [2]

OR

In an equilateral triangle of side $3\sqrt{3}$ cm find the length of the altitude.

Q24. A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0-2	2-4	4-6	6-8	8-10	10-12	12-14
Number of houses	1	2	1	5	6	2	3

Q25. Using Euclid's algorithm, find the HCF of 240 and 228. [2]

Q26. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers

SECTION C

Q27. Verify whether 2, 3 and $\frac{1}{2}$ are the zeroes of the polynomial $p(x) = 2x^3 - 11x^2 + 17x - 6$. [3]

OR

Find the zeroes of the quadratic polynomial $5x^2 + 8x - 4$ and verify the relationship between the zeroes and the coefficients of the polynomial.

Q28. If 7th term of an A.P. is $\frac{1}{9}$ and 9th term is $\frac{1}{7}$, find 63rd term. [3]

Q29. If the co-ordinates of points A and B are (-2, -2) and (2, -1) respectively, find the co-ordinates of P such that $AP = \frac{3}{4}AB$, where P lies on the line segment AB. [3]

OR

If the distance of P(x, y) from A(6, 2) and B(-2, 6) are equal, prove that $y = 2x$.

Q 30. Solve $3x + y - 5 = 0$ and $2x - y - 5 = 0$ graphically

OR

$$\text{Solve for } x : \frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}; x \neq 1, 2, 3$$

Q33. An electric pole is 10 m high. A steel wire tied to top of the pole is affixed at a point on the ground to keep the pole upright. If the wire makes an angle of 45° with the horizontal through the foot of the pole, find the length of the wire. [Use $\sqrt{2} = 1.414$] [3]

Q32. without using trigonometric table evaluate

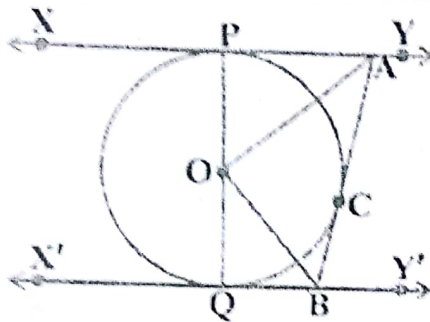
a) $\tan 48. \tan 23. \tan 42. \tan 67$

b) $\cos 38. \cos 52 - \sin 38. \sin 52$

Q33. Prove that

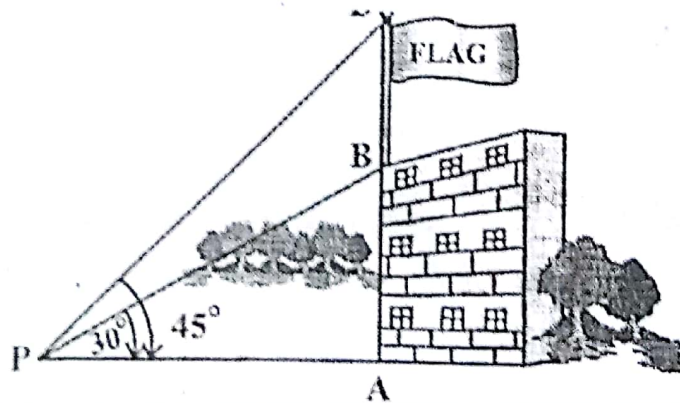
$$\frac{\cos A - \sin A + 1}{\cos A - \sin A - 1} = \operatorname{cosec} A + \cot A$$

Q34. in fig. XY and $X'Y'$ are two parallel tangents to a circle with centre O and another tangent intersect AB with point of contact C intersecting XY at A and $X'Y'$ at B . Prove that $\angle AOB = 90^\circ$



Section D

Q35. From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30° . A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° . Find the length of the flagstaff and the distance of the building from the point P . (You may take $\sqrt{3} = 1.732$)



Q36. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

OR

Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their lengths.

Q37. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are (0, -1), (2, 1) and (0, 3). Find the ratio of this area to the area of the given triangle.

Q38 The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (in units)	Number of consumers
65 - 85	4
85 - 105	5
105 - 125	13
125 - 145	20
145 - 165	14
165 - 185	8
185 - 205	4

Q39. State and prove Pythagoras theorem

If triangle ABC is an isosceles triangle right angle at C. Prove that

$$AB^2 = 2AC^2$$

Q40. A sum of Rs 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs 20 less than its preceding prize, find the value of each of the prizes.

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①

Section A

QNO. 1 to 20

- QNO. 1 - Correct answer - 1 mark
- QNO 2. " 1 mark
- QNo-3 - For correct answer 1 mark.
- QNO-4 " 1 mark
- QNo-5 For correct option 1 mark
- Q No-6. $3\sqrt{3}$ 1 mark.
- Q NO 7 - c (option) or 4 1 mark
- Q No-8 Correct option 1 mark.
- Q NO-9 Correct option 1 mark
- Q No 10. (d) option
or
Definition 1 mark.
- Q No 11 $r=0$ 1 mark
- Q No-12 Correct Answer 1 mark
- Q No-13 Correct value of $S_n A$ 1 mark
- Q No 14 . b option 1 mark
- Q No 15 Correct formula 1 mark

- Q No. 16, Correct value of Ec. 1 mark
- Q No 17. $\angle AED = 40^\circ$ 1 mark.
- Q No 18. Correct length of (height) - 1 mark
- Q No 19. Correct no. of points 7 - 1 mark
- Q No 20. 3 median = Mode + 2 mean - 1 mark

Q No 21, Section B
 Correct ~~value of~~ k
 Formula
 $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ 1 mark
 Correct Answer of k. 1 mark.

Q No 22
 Coordinate
 Equality of length 1 mark
 Correct coordinate of P 1 mark

Q No 23 For correct formula 1 mark
 Correct value of altitude 1 mark

Q No 24 Formula 1 mark
 correct result 1 mark

Q No 25 Euclid's method - 1 mark
 HCF 1 mark

Q No 26 - for each part - 1 mark } 1 x 2 = 2 mark

Section C
Q No. 27 for 2, 3 & $\frac{1}{3}$ } 1 x 3 = 3
or,

Sum of zeros - 1 mark
Product of zeros 1 mark
Verification 1 mark } 3 mark

Q No 28 Correct equation forming } 1 x 2 = 2 } 3 mark
 63^{rd} term

Q No 29 Formulae 1 mark
Step 1 mark
Result 1 mark } 3 mark

Q No 30 Formation of table with coordinate } $\frac{1}{2} \times 3 = 1\frac{1}{2}$
Graphical work } $\frac{1}{2} \times 3 = 1\frac{1}{2}$ } 3 mark

Q No 31 fig - $\frac{1}{2}$ mark
Use of identities $\frac{1}{2}$ mark
Result with correct steps 2 } 3 mark

Q No 32 - for each part - correct/use application of (90-0).

1/2 } 1/2 x 2 = 3 marks

Q No 33

Use of identity
 $\sin^2 \theta + \cos^2 \theta = 1$ -
step
value equal to RHS

3 marks

Q No 34

Congruence of two triangle 1+1
Calculation of value of $\angle AOB = 90^\circ$

3 marks
1 mark

Section D

Q No 35

fig 2. identity
Choosing correct angle
Comparing the values
Result

1 mark
1 mark
1 mark
1 mark
4 marks

Q No 36

Correct construction of triangle
correct dimension of side
Parallel lines const-
similar triangle formation

1 mark
1 mark
1 mark
1 mark
4 marks

Q No 37

finding mid point
Area of New triangle
Area of original triangle
Correct ratio

1 mark
1 mark
1 mark
1 mark
4 marks

(3)

Q No 38	For modal class	1 mark	} 4 marks
	For formula	1 mark	
	For mean calculator	1 mark	
	For mean calculator	1 mark	

Q No 39	Correct statement	1 mark	} 4 marks
	Proof of theorem	2 marks	
	Solution for	1 mark	

Q No 40	Correct value of sn , ans & d at steps	3 x 1 = 3 marks	} 4 marks
	for correct value of each base prices.	1 mark	