MODERN MIDDLE EAST INTERNATIONAL SCHOOL

Academic Year 2019 – 2020

PRE-BOARD EXAM-II

Name :	**Class : 10 Sec:**	**Date: 12 / 01 /2020**
Subject : Mathematics	**Duration : 3 hours**	**Max. Marks : 80**

General Instructions:

1. All questions must be answered.
2. The question paper consists of 40 questions divided into four sections A, B, C, and D.
3. Section A contains 20 questions of 1 mark each. Section B contains 6 questions of 2 mark each. Section C contains 8 questions of 3 mark each and Section D contains 6 questions of 4 mark each.
4. There is no overall choice. However, an internal choice has been provided in each section. You have to attempt only one of the alternatives in all such questions.
5. Use of calculator is not permitted.
6. Please check that this question paper contains 7 printed pages.

SECTION A

Question numbers 1 to 20 carry 1 mark each. **(20 × 1= 20)**

1) If p, q are two consecutive natural numbers, then HCF(p,q) =_____

a) q b) p c) 1 d) pq

2) If the 'less than type' ogive and 'more than type' ogive intersect each other at (20.5,15.5) then the median of the given data is

a) 5.5 b) 15.5 c) 20.5 d) 36.0

3) The decimal expansion of number $\frac{37}{2^2 \times 5}$ will terminate after

a) one decimal place b) two decimal places

c) three decimal places d) four decimal places

4) The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have

a) a unique solution b) exactly two solutions

c) infinitely many solutions d) no solution

5) In ΔABC , $cot\frac{B+C}{2}$ =

a) $cot\frac{A}{2}$ b) $tan\frac{B}{2}$ c) $tan\frac{A}{2}$ d) $cot\frac{C}{2}$

6) If $sinA = \frac{1}{3}$, then the value of $9\cot^2 A + 9$ is

a) 1 b) 81 c) 9 d) $\frac{1}{81}$

7) The value of the expression $\sin^2 63° + \cos 63° \, sin27°$ is

a) 3 b) 2 c) 1 d) 0

8) A(5,1), B(1,5) and c(-3,-1) are the vertices of ΔABC, then the length of median AD is

a) $\sqrt{37}$ units b) $\sqrt{32}$ units c) 7 units d) 5 units

9) If the point A(0,2) is equidistant from the points B(3,p) and C(p,5), then the value of p is ____

a)1 b) 2 c) 3 d) 0

10) The distance of the point P(-6,8) from the origin is ____

a)8 b) $2\sqrt{7}$ c) 6 d) 10

(Q11-Q15) Fill in the blanks

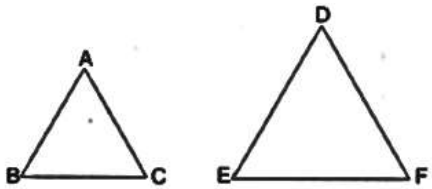
11) A quadratic polynomial whose zeroes are -3 and 4 is _____

OR

If $(x + a)$ is a factor of $2x^2 + 2ax + 5x + 10$, then the value of a is _____

12) If the surface area of a sphere is 616cm^2, then its diameter (in cm) is _____

13) If ΔABC ~ ΔDEF such that 2AB = DE and BC = 8 cm, then the length of EF =_____

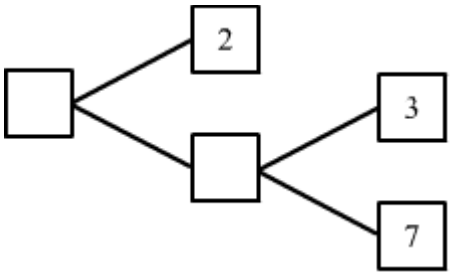


14) In an A.P if d = - 4, n = 7, a_n = 4, then a is _____

15) Two coins are tossed simultaneously then the probability of getting exactly 2 heads is____

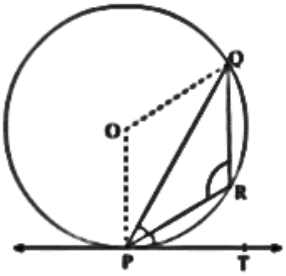
(Q16-Q20) Answer the following

16) Complete the missing entries in the following factor tree.



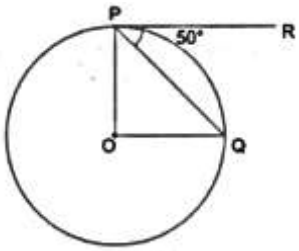
17) If ΔABC ~ ΔQRP, $\frac{ar(\Delta ABC)}{ar(\Delta QRP)} = \frac{9}{4}$, and BC=15cm, then find PR.

18) PQ is a chord of a circle with center O and PT is a tangent at P such that ∠QPT = 60° , find ∠PRQ.



OR

In the given figure, O is the centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ. Find ∠POQ.



19) Which of the term of the A.P 5,2,-1, …, is -49?

20) Show that x= -2 is a solution of quadratic equation $3x^2 + 13x + 14 = 0$.

SECTION B

Question numbers 21 to 26 carry 2 mark each. **(6×2 =12)**

21) Find the middle term of the A.P 6,13,20,…,216.

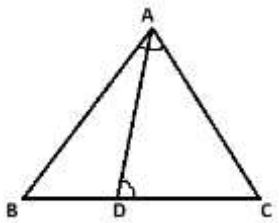
OR

Find the next term of the A.P $\sqrt{2}, \sqrt{8}, \sqrt{18}$, ...

22) Two poles of heights 10m and 15m stand vertically on a plane ground. If the distance between their feet is $5\sqrt{3}$m, find the distance between their tops.

OR

D is a point on the side BC of a ΔABC such that ∠ADC=∠BAC. Show that $CA^2=CB.CD$



23) The angle of elevation of the top of a vertical tower from a point on the ground is 60^o.From another point 10m vertically above the first, its angle of elevation is 30^o .Find the height of the tower.

24) If from an external point P of a circle with centre O, two tangents PQ and PR are drawn such that ∠QPR = 120^o, prove that 2PQ= PO.

25) How many shots each having diameter 3 cm can be made from a cuboidal lead solid of dimensions 9 cm x 11 cm x 12 cm?

26) A black die and a white die are thrown at the same time. What is the probability that:

i) that the product of numbers appearing on the top of the dice is less than 2.

ii) obtaining a total of 6.

OR

A bag contains 5 red, 8 green and 7 white balls. One ball is drawn at random from the bag, find the probability of getting

(i) a white ball or a green ball.

(ii) neither a green ball not a red ball.

SECTION C

Question numbers 27 to 34 carry 3 mark each. **(8×3=24)**

27) Prove that $3 + 2\sqrt{5}$ is an irrational number.

OR

Find HCF of 441, 567 and 693 by Euclid's Division Algorithm.

28) Quadratic polynomial $2x^2 - 3x + 1$ has zeroes as α and β. Now form a quadratic polynomial whose zeroes are 3α and 3β.

29) Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded 4 marks for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?

OR

Solve graphically the following system of linear equations:

$$2x + 3y = 8$$

$$x - 2y = -3 .$$

Also find the coordinates of the points where the line meets the axis of x in each system.

30) The 16th term of an A.P is 1 more than twice its 8^{th} term. If the 12^{th} term of the A.P is 47, then find its n^{th} term.

31) If two adjacent vertices of a parallelogram are (3, 2) and (– 1, 0) and the diagonals intersect at (2, – 5), then find the coordinates of the other two vertices.

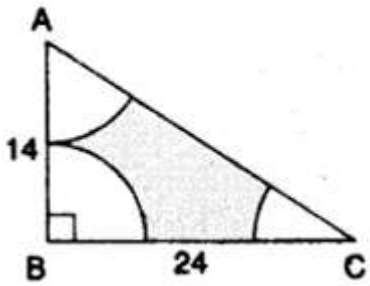
32) Prove the following identity:

$$(1 + cot\ \theta - cosec\theta)(1 + tan\theta + sec\theta) = 2$$

OR

$$\sqrt{\frac{\sec\theta - 1}{\sec\theta + 1}} + \sqrt{\frac{\sec\theta + 1}{\sec\theta - 1}} = 2\ \text{cosec}\ \theta$$

33) In the given figure, ABC is a triangle right angled at B, with AB=14cm and BC=24cm with the vertices A, B and C as centres of arcs are drawn each of radius 7cm. Find the area of the shaded region. (Use $\pi = \frac{22}{7}$).



34) The median of the following data is 50. Find the value of p and q if the sum of all frequencies is 90.

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	P	15	25	20	q	8	10

SECTION D

Question numbers 35 to 40 carry 4 mark each. **(6 × 4 =24)**

35) Find the values of k for which the equation $(3k + 1)x^2 + 2(k + 1)x + 1 = 0$ has equal roots. Also find the roots.

OR

A motor boat whose speed is 18 km/hr in still water takes 1 more hour to go 24km

upstream than to return downstream to the same spot. Find the speed of the stream.

36) State and prove Converse of Pythagoras theorem.

37) A bird sitting on the top of a 80m high tree. From a point on the ground, the angle of elevation of the bird is 45°. The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 seconds, the angle of elevation of the bird from the same point is 30°. Find the speed of flying of the bird. [Use $\sqrt{3}=1.732$]

38) Draw a triangle ABC with side BC = 6 cm, AB=5cm and $\angle B = 60°$. Then construct a triangle whose sides are $\frac{3}{4}$ times the corresponding sides of ΔABC.

OR

Draw two concentric circles of radii 3 cm and 5 cm. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length.

39) A container open at the top and made up of metal sheet is in the form of a frustum of a cone of height 16cm.With diameters of its lower and upper ends as 16cm and 40cm, respectively. Find the cost of the milk which can completely fill the container, at the rate of Rs.20 per litre. Also, find the cost of metal sheet used to make the container, if it costs Rs.10 per $100cm^2$. (Take $\pi= 3.14$)

OR

A well of diameter 4m is dug 14m deep. The earth taken out is spread evenly all around the well to form a 40cm high embankment. Find the width of the embankment.

40) Find mean and mode of the following data.

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3