MODERN MIDDLE EAST INTERNATIONAL SCHOOL
Academic Year 2019 – 2020

PRE-BOARD EXAM-III-EXAMINATION

MATHEMATICS

CLASS : X   **Sub Code: 241(B)/041(S)**   **Time Allotted: 3 Hours**

Name:…………………… **Max. Marks: 80**   **Date: 6.2.2020**

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) HCF(96,404) =_____

   a) 6   b) 4   c) 1   d) 9696

2) Relationship between mean, median and mode is

   a) Mode=3Median-2Mean   b) Mean=3Median-2Mode

   c) Median=3Mode-2Mean   d) None of these

3) The decimal expansion of number $\frac{129}{2^2 5^7 7^5}$ is

   a) Terminating   b) Non-terminating repeating
   c) Non-terminating non-repeating   d) none of these

4) The lines representing the pair of equations $\frac{3}{2}x + \frac{5}{3}y = 7$ and $9x - 10y = 14$ are

    a) Intersecting lines   b) Parallel Lines

    c) Coincident lines   d) None of these

5) $\frac{1+tan^2 A}{1+cot^2 A} =$

    a) $sec^2 A$ b) -1 c) $cot^2 A$ d) $tan^2 A$

6) If $sin 3A = \cos(A - 26°)$,where A is an acute angle then the value of A is

    a) 29°   b) 16°   c) 58°   d) 19°

7) $tan 48° \, tan 23° \, tan 42° \, tan 67° =$ _____

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

8) The ordinate of a point A on y-axis is 5 and B has coordinates (-3,1). The length of AB is

    a) 25 units   b) 5 units   c) 7 units   d) 15 units

9) Area of a triangle whose vertices are (1,-1),(-4,6) and (-3,-5) is ____

    a)24 sq units   b) -24 sq units   c) 8 sq units   d) 5 sq units

10) The coordinates of the point which divides the line segment joining the points (4,-3) and (8,5) in the ratio 3:1 internally is ____

    a) (7,3)   b) (5,3)   c) (3,7)   d) (7,-3)

(Q11-Q15) Fill in the blanks

11) A quadratic polynomial whose zeroes are 0 and $\sqrt{5}$ is _____

OR

    The zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ are _____

12) Formula for TSA of frustum is _____

13) ABC is an equilateral triangle of side 2a then each of its altitude is _____.

14) The sum of first 22 terms of AP : 8,3,-2,… is_____

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15) If in a group of 3 students, the probability of 2 students not having the same birthday is 0.992, then the probability of 2 students having the same birthday is____

(Q16-Q20) Answer the following

16) Check whether 6^n can end with digit 0 for any natural number n.

17) Check whether the following pair of triangles are similar. Give reason.
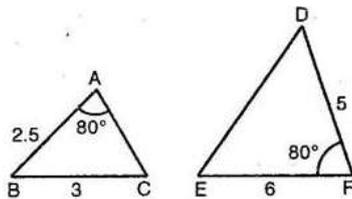
18) The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4cm. Find the radius of the circle.

OR

If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80°. Find ∠POA.

19) Check whether -150 is a term of AP: 11,8,5,2,…?

20) Find the roots of quadratic equation $3x^2 - 5x + 2 = 0$ using quadratic formula.

SECTION B

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

21) How many 3 digit numbers are divisible by 7?

OR

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In a flower bed, there are 23 rose plants in the first row,21 in the second row, 19 in the third row, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?

22) O is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.
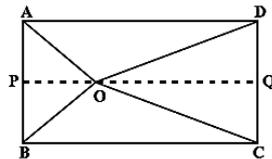
OR

Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding medians.

23) An observer 1.5m tall is 28.5m away from a chimney the angle of elevation of the top of the chimney from his eyes is 45o What is the height of the chimney?

24) Prove that the parallelogram circumscribing a circle is a rhombus.

25) A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Figure. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm. Find the total surface area of the article.
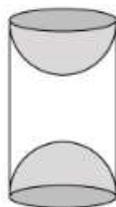
26) A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears

i) a two-digit number   ii) a perfect square number

OR

Five cards - the ten, jack, queen, king and ace of diamonds are well-shuffled with their face downwards. One card is then picked up at random.

(i)What is the probability that the card is jack?

(ii)If the queen is drawn and put aside, what is the probability that the second card picked up is a ten?

SECTION C

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

27) Use Euclid's division lemma to shat that the square of any positive integer is of the form 3m, 3m+1 for integer m.

OR

Use Euclid's Division Algorithm to find the HCF of 4052 and 12576.

28) Verify that the numbers given along side of the cubic polynomial are their zeroes. Also verify the relationship between the zeroes and the coefficients.

$2x^3 + x^2 - 5x + 2$; $\frac{1}{2}, 1, -2$.

29) A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h; it would have taken 3 hours more than the scheduled time. Find the distance covered by the train.

OR

Use Elimination method to find all the possible solutions of the following pair of linear equations:

$2x + 3y = 8$

$$4x + 6y = 7$$

30) The first term of an A.P. is 5, the last term is 45 and the sum of all its terms is 400. Find the number of terms and the common difference of the A.P.

31) Find the coordinates of the point of trisection of the line segment joining the points A(2,-2) and B(-7,4).

32) In ΔOPQ, right-angled at P, OP= 7cm and OQ - PQ=1cm.Determine the values of sinQ and cosQ.

OR

Prove the following identity:

$$\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \sec \theta \, \csc \theta$$

33) In a circular table cover of radius 32 cm, a design is formed leaving an equilateral triangle ABC in the middle as shown in the below figure. Find the area of the design.

34) The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs.18. Find the missing frequency f.

Daily pocket allowance (in Rs.)	11-13	13-15	15-17	17-19	19-21	21-23	23-25

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Number of children	7	6	9	13	f	5	4

SECTION D

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

35) A pole has to be erected at a point on the boundary of a circular park of diameter 13 meters in such a way that the difference of its distance from two diametrically opposite fixed gates A and B on the boundary is 7 meters. Is it the possible to do so? If yes, at what distance from the two gates should the pole be erected?

OR

In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

36) State and prove Basic proportionality Theorem.

37) Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30°, respectively. Find the height of the poles and the distances of the point from the poles.

38) Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are $1\frac{1}{2}$ times the corresponding sides of the isosceles triangle.

OR

Let ABC be a right triangle in which AB = 6 cm, BC = 8 cm and ∠B = 90°. BD is the perpendicular from B on AC. The circle through B, C, D is drawn. Construct the tangents from A to this circle.

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39) A gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm.

OR

The radii of the ends of a frustum of a cone 45 cm high are 28 cm and 7 cm . Find its volume, the curved surface area and the total surface area.

40) During the medical checkup of 35 students of a class, their weights were recorded as follows:

Weight(in kg)	Frequency
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive curve for the given data. Hence obtain median weight form the graph and verify the result by using the formula.

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