Global India International School

GLOBAL INDIAN INTERNATIONAL SCHOOL

MID TERM EXAM

2019-2020

MATHEMATICS (CODE : 041)

Grade : X **Max. Marks : 80**

Date : 23 / 08 / 19 **Duration : 3 hours**

General Instructions

i) *All questions are compulsory.*

ii) *The time given at the head of this paper is the time allowed for writing the answers. An extra 10 minutes will be given for reading the question paper.*

iii) *This question paper contains 7 printed pages.*

iv) *This question paper contains 40 questions divided into four sections – A, B, C and D*

v) *Section A contains 20 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 8 questions of 3 marks each and Section D contains 6 questions of 4 marks each.*

vi) *There is no overall choice. However, there is an internal choice has been provided in 2 questions of 2 marks each, 2 questions of 3 marks each and 2 questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.*

vii) *Use of calculators is not permitted.*

Section A

Question number 1 to 20 carry 1 mark each.

1. The decimal expansion of the rational number $\frac{1}{2^3 5^2}$ will terminate after

   a) one decimal place
   b) two decimal places
   c) three decimal places
   d) more than three decimal places

2. 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 HCF(A,B) is

a) xy b) xy^2 c) x^3y^3 d) x^2y^2

3.If $\propto$ $and\frac{1}{\propto}$ are the zeroes of the polynomial $6x^2+11x$ - (k-2) , then the Value of k is

a)4 b) - 4 c) 3 d) - 3

4.The value(s) of p for which the pair of linear equation $3x$ -$2y$ -7=0 and $6x$ +py +11=0 have a unique solution is (are)

a) 4 b) all real numbers except 4 c) -4 d) all real numbers except -4

5.If $\propto$ and β are the zeroes of the polynomial $2x^2$ +$7x$ -3,then the value of $\propto^2+\beta^2$ is

a) $\frac{21}{4}$ b) $\frac{61}{4}$ c)$\frac{37}{4}$ d) $\frac{49}{4}$

6. The pair $3x = 7y + 4$ and $14y = 6x - 8$ of linear equations represents two lines which are

a) Intersecting b) coincident c) parallel d) none

7. 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) a=1 d) a=c

8. If the equation $2x^2$-$6x + p$ =0 has real and distinct roots, then the

values of p are given by

a) $p<\frac{9}{2}$ b) $p\leq\frac{9}{2}$ c) $p>\frac{9}{2}$ d) $p\geq\frac{9}{2}$

9. The perimeter of the circle is equal to that of a square,then the ratio of the areas is

a) 22:7 b) 14:11 c) 7:22 d) 11:14

10. Area of the largest triangle that can be inscribed in a semi circle of radius are r units is

a) r^2sq units b) $\frac{1}{2}r^2$sq units c) $2r^2$ sq units d)$\sqrt{2r^2}$sq units.

11. Find the value of $\tan1^0\tan2^0\tan3^0.....\tan89^0$

12. Find the value of $3tan^225^0-3sec^225^0$.

13. If $sec\theta+tan\theta=p$ then find the value of $sec\theta-tan\theta$.

14. A ladder 14m long rests against a wall.If the foot of the ladder is 7m from the wall , then find the angle of elevation of it.

15. If the angle of depression of an object from a 75m high tower is 30^0, then find the distance of the object from the tower .

16. If one die is thrown then find the probability of getting a prime number.

17. A number is selected from numbers 1 to 25.The probability that it is a perfect square.

18. What is the probability of a sure event ?

19.If the areas of two similar triangles are in the ratio 4:9, then find the ratio of their corresponding sides.

20.write any two examples of similar figures

Section B

Questions 21 to 26 carry 2 marks each.

21. Check whether 6^n can end with the digit 0 for any natural number n or not.

22.a) Solve : 99x + 101y = 499

101x + 99y = 501.

OR

b)Solve $\frac{11}{x} - \frac{7}{y} = 1$ and $\frac{9}{x} - \frac{4}{y} = 6$

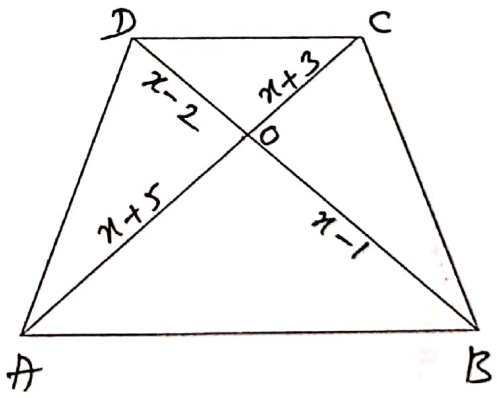
23.a)Find the value of $sin^2 1^0 + sin^2 2^0 + sin^2 3^0 + \ldots\ldots\ldots\ldots + sin^2 89^0$.

OR

b)If $2sin^2\theta - cos^2\theta = 2$ then find the value of θ.

24.Two dice are thrown simultaneously. Find the probability of getting a doublet.

25.In the given figure, if AB || DC, find the value of 'x'



26. Find the roots of $x^2+2\sqrt{2}x-6=0$ by using quadratic formula.

Section C

Questions 27 to 34 carry 3 marks each.

27. Prove that $\sqrt{7}$ is an irrational.

28. Find the values of 'k' for which the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots.

29. Two customers Abhinav and Alwin are visiting a particular shop in the same week (Monday to Friday) . Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop

i)on the same day?
ii) consecutive days?
iii)different days?

30.a) Prove that $\sqrt{\frac{1+Sin\,A}{1-Sin\,A}}$ = sec A+ tan A

(OR)

b) $Cos\theta+Sin\theta=\sqrt{2}Cos\theta, show\ that\ Cos\theta-Sin\theta=\sqrt{2}Sin\theta.$

31.a) The angles of the elevation of the top of a tower from two points at a distance of **a** units and **b** units from the base of the tower and in the same straignt line with it are complementary. Prove that the height of the tower is $\sqrt{ab}$ units.

(OR)

b)An aeroplane, when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplane at that instant.

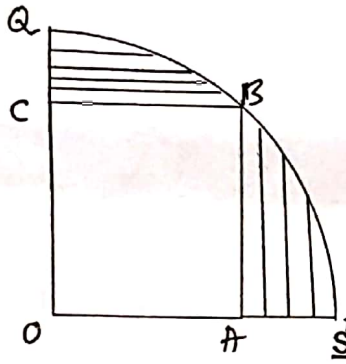
32.a) 'D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$

(OR)

b) If the areas of two similar triangles are equal, prove that they are congruent.

33.Find a quadratic polynomial whose zeroes are $\frac{3+\sqrt{5}}{5}$ and $\frac{3-\sqrt{5}}{5}$.

34. In the given figure , a square OABC is inscribed in a quadrant OPBQ. If OA= 20cm , find the area of the shaded region.



Section D

Questions from 35 to 40 carry 4 marks each.

35.Draw the graph of the following equations:

$x + y = 5$; $x - y = 5$

(i) Find the solution of the equations from the graph.

(ii) Shade the triangular region formed by the lines and the y axis.

36.A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

37. a) Prove that $\frac{CosA-Sin\,A+1}{Cos\,A+Sin\,A-1}$ = Cosec A+ Cot A

(OR)

b) If Cosec A+ Cot A =m, show that $\frac{m^2-1}{m^2+1}$= CosA.

38. a) As observed from the top of a 75 m high light house from the sea-level, the angles of depression of two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships.

39. a) A street light bulb is fixed on a pole 6 m above the level of the street. If a woman of height 1.5 m casts a shadow of 3 m, find how far she is away from the base of the pole.

(OR)

b) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points,the other two sides are divided in the same ratio. Prove it.

40. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting

(i) A red card

(ii) A black card

(iii) A king of red colour

(iv) A face card

(v) A red face card

(vi) A spade

(vii) Either a red card or a queen.

(viii) Neither a spade nor an ace.