2019

MATHEMATICS QUESTION PAPERS FOR 10TH STD.

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MODEL QUESTION PAPER-1

Subject: Mathematics Subject code: 81E

Time : 3 hours Max.marks: 80

I. In the following questions four choices are given for each question chose and write correct answer along with its alphabet:

1. HCF of 6 & 20 is ….
   a. 1 b. 30 c. 60 d. 2
2. If Cos A=$\frac{1}{2}$, then the value of Sin A is…..
   a. 4 b. $\frac{\sqrt{3}}{2}$ c. $\sqrt{3}$ d. 1
3. Secant touches the circle …. Times.
   a. 2 b. 3 c. 4 d. 1
4. Which of the following formula to use to find the volume of cone.
   a. $\frac{1}{3}\pi r^2h$ b. πr^2h c. $4\pi r^3$ d. $\frac{2}{3}\pi r^2$
5. If $a_n=4_n-2$, then the value of a_4 is….
   a. 8 b. 14 c. 10 d. 6
6. In ΔLMN,$\angle L$=50° and $\angle N$=60°. If $\Delta LMN \sim \Delta PQR$, then find $\angle Q$.
   a. 70^0 b. 60^0 b. 90^0 d. 180^0
7. The probability of sure event is ……..
   a. 0 b. 1 c. 0.5 d. 0.65
8. The roots of the equation $x2+x-(p+1)=0$, where p is a constant, are ….
   a. p, p+1 b. –p , p+1 c. p. –(p+1) d. –p, -(p+1)

II. Answer the following questions 1 x8 =8

9. Show that x=-3 is a solution of $x^2+6x+9=0$.
10. Find the value of k in which one root of the quadratic equation is $kx^2-14x+8=0$ is six times the other.
11. If the 10^{th} term of an A.P is 20 & common difference is 2, then find the 4^{th} term.

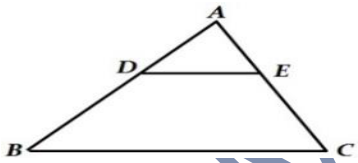
12. State Pythagoras theorem.
13. Express 140 as its product of prime factors.
14. If sec A=$\frac{15}{7}$, & A+B=90^0, then find the value of Cosec B.
15. Find : $\sin^2 30^0+\cos^2 60^0$.
16. Volume and surface area of the solid hemisphere are numerically equal. What is the diameter of the hemisphere?.

III. Answer the questions 2x8=10

17. Prove that $\sqrt{3}$ is an irrational number.
18. Solve x+y=5 & 2x-y=7.
19. Find the value of p, for which one root of the quadratic equation $px^2-14x+8=0$ is 6 times the other.
20. Find the distance between the points, $A(2a,6a)$ and $B(2a+\sqrt{3}a,5a)$.
21. E is a point on the side AD produced of a parallelogram $ABCD$ and BE intersects CD at F. Show that $\Delta ABE \sim \Delta CFB$.

OR

In the figure given below, $DE \| BC$. If $AD=2.4\ cm, DB=3.6\ cm$ and $AC=5\ cm$ Find AE.



22. Two cubical dice whose faces are numbered from 1 to 6 are rolled simultaneously once. Find the probability that the sum of the two numbers occurring the top of the face is 6.
23. Construct a pair of tangents to the circle of radius 4.5cm from an external point 5.5cm from the circle.
24. Find the value of cosec30°, geometrically.

OR

If A,B,C are interior angles of ΔABC, then show that $\cos(\frac{B+C}{2})=\sin\frac{A}{2}$

IV. Solve the following problems 3x9=27

25. A number consists of two digits. When the number is divided by the sum of its digits, the quotient is 7. If 27 is subtracted from the number, the digits interchange their places. Find the number.

OR

The sum of two numbers is 8. Determine the numbers if the sum of their reciprocals is $\frac{8}{15}$.

26. If the polynomial $6x^4+8x^3-5x^2+ax+b$ is exactly divisible by the polynomial $2x^2-5$, then find the value of a and b.

27. If the equation $(1+m^2)x^2+2mcx+c^2-a^2=0$ has equal roots then show that $c^2=a^2(1+m^2)$.

OR

If the sum of two natural numbers is 8 and their product is 15, find the numbers.

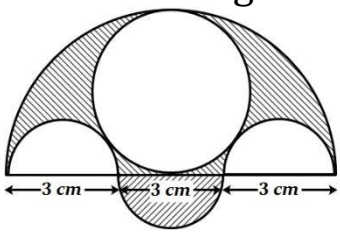
28. The vertices of a triangle are $A(-1,3)$,$B(1,-1)$ and $C(5,1)$. Find the length of the median through the vertex C.

OR

Find the coordinates of the points of trisection of the line segment joining the points $(3,-2)$ and $(-3,-4)$.

29. Prove that "the tangents drawn from an external point to the circle are equal".

30. Three semicircles each of diameter 3 cm, a circle of diameter 4.5 cm and a semicircle of radius 4.5 cm are drawn in the given figure. Find the area of the shaded region.



OR

Find the area of the minor segment of a circle of radius 42 cm, if the length of the corresponding arc is 44 cm.

31. Draw **less than** ogive for the given data:

C.I	45-55	55-65	65-75	75-85	85-95
f	3	10	11	8	3

32. Find the mean value for the given data:

C.I	0-10	10-20	20-30	30-40	40-50
f	3	5	9	5	3

33. Draw base BC=5cm, construct a triangle to it if $\angle ABC=60^0$, & $\angle ACB=70^0$. Construct another triangle similar to it with $\frac{3}{5}$ th of the corresponding sides.

V. Solve 4x4=16

34. Solve pair of linear equations graphically : x-2y=0 & 3x+4y=20.

35. The sum of first six terms of an arithmetic progression is 42. The ratio of its 10th term to its 30th term is 1:3. Calculate the first and the thirteenth term of the *A.P*.

OR

The sum of the first sixteen terms of an A.P. is 112 and the sum of its next fourteen terms is 518. Find the A.P.

36. A moving boat is observed from the top of a 150 m high cliff moving away from the cliff. The angle of depression of the boat changes from 60° to 45° in 2 minutes. Find the speed of the boat in m/h.

37. State and prove B.P.T(Basic proportionality theorem).

VI. Solve the given problem 5x1=5

38. A toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of base of the cone is 21 cm and its volume is $\frac{2}{3}$of the volume of the hemisphere, calculate the height of the cone and the surface area of the toy.