CKS CODE : 1316

MODEL EXAMINATION
MATHEMATICS (STANDARD)

CLASS - X   **TIME: 3 Hours**
                                                             Max. Marks: 80

General Instructions:

Read the following instructions carefully and follow them:

(i)   This question paper contains 38 questions. All questions are compulsory.

(ii)   This question paper is divided into five sections-A,B,C,D and E.

(iii)   In section A, Questions no 1 to 18 are multiple choice questions (MCQs) and questions number 19 and 20 are Assertion – Reason based questions of mark 1 each.

(iv)   In Section B, Questions no.21 to 25 are very short answer(VSA)type questions, carrying 2 marks each.

(v)   In Section C, Questions no 26 to 31 are short answer(SA)type questions, carrying 3 marks each.

(vi)   In section D, Questions no. 32 to 35 are long answer(LA) type questions carrying 5 marks each.

(vii)   In Section E, Questions no.36 to 38 are case study based questions carrying 4 marks each. Internal choice is provided in 2 marks questions in each case –study.

SECTION - A

This section comprises multiple choice questions(MCQs) of 1 mark each.

1. A card is drawn at random from a well shuffled pack of 52 cards. The probability that the card drawn is not an ace is:

    (a) $\frac{1}{13}$ (b) $\frac{9}{13}$ (c) $\frac{4}{13}$ (d) $\frac{12}{13}$

2. If α,β are zeroes of the polynomial p(x)=$4x^2 - 3x - 7$ then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to:

    $(a)\frac{7}{3}$ $(b)-\frac{7}{3}$ $(c)\frac{3}{7}$ $(d)-\frac{3}{7}$

3 .In △ ABC ,PQ☐BC, If PB=6 cm, AP=4cm ,AQ=8 cm, then the length of AC is:
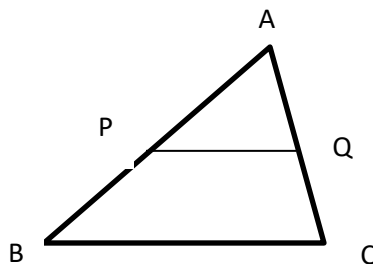
    (a) 20 cm   (b) 6 cm   (c) 12 cm   (d) 14 cm

4.The empirical relation between the mode, median and mean of a distribution is:

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

       (c)Mode=2 Median-3 Mean   (d) Mode=2 Mean-3 Median

5.The LCM and HCF of 6 and 20 is:

      (a) 2,60   (b) 3,60   (c) 60,2   (d) 60,3

6. The area of the sector of a circle with radius 4 cm and of angle 30^0 is (π=3.14)

      (a) 40.1   (b) 46.1   (c) 4.18   (d) 38.9

7.The 10th term of the AP: 2,7,12,..........is:

      (a)51   (b) 48   (c)47   (d)74

8.If the distance between the points A(4,P) and B(1,0) is 5 units, then the value of p is:

      (a) 4   (b)-4   (c)±4   (d)0

9. If the lines $3x + 2ky - 2 = 0$ and $2x + 5y + 1 = 0$ are parallel,then the value of k is:

      (a) $\frac{4}{15}$ (b) $\frac{15}{4}$ (c)$\frac{4}{5}$ (d) $\frac{5}{4}$

10. If a cylinder is covered by two hemispheres shaped lid of equal shape ,then the total curved surface area of the new object will be:

      (a) $4\pi rh + 2\pi r^2$ (b) $4\pi rh - 2\pi r^2$ (c)$2\pi rh + 4\pi r^2$ (d)$2\pi rh + 4\pi r$

11. (sin 30^0+ cos60^0)-(sin 60^0+cos30^0) is equal to:

      (a) 0   (b) 1+2$\sqrt{3}$ (c) $1 - \sqrt{3}$ (d)$1 + \sqrt{3}$

12. The sum of two numbers is 27 and the product is 182.The numbers are

      (a) 12 and 13   (b) 13 and 14 (c) 12 and 15 (d) 13 and 24

13.The angle of depression of a car, standing on the ground, from the top of a 75 m high tower is 30^0.The distance of the car from the base of tower is:

      (a) $25\sqrt{3}$ (b)$50\sqrt{3}$ (c)$75\sqrt{3}$ (d)150

14. Which term of the AP 3,8,13,18,…..is 78

      (a) 12th (b) 13th (c) 15th (d) 16th

15. If two positive integers A and B can be expressed as A=xy^3 $and\ B = x^2y^2$,$x, y\ being\ prime\ numbers, then$ HCF(A,B) is:

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

16. The mode of the following distribution is:

Classes	25-30	30-35	35-40	40-45	45-50	50-55
Frequency	25	34	50	42	38	14

(a) 90　　(b) 38.33　　(c) 49.5　　(d) 40.2

17. A number is selected at random from 1 to 30. The probability that it is prime number is :

(a) $\frac{1}{2}$　　　(b) $\frac{8}{9}$　　　(c) $\frac{1}{3}$　　　(d) $\frac{2}{3}$

18. If the volume of a cube is 1728cm³ ,the length of its edge is equal to :

(a) 7cm　　(b) 18cm　　(c) 19cm　　(d) 12cm

Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labeled as Assertion(A) and the other is labeled as Reason(R) .Select the correct answer to these questions from the codes (a),(b),(c),and (d) as given below.

(a) Both Assertion (A) and Reason (R) are true and Reason(R) is the correct explanation of the Assertion (A).

(b) Both Assertion(A) and Reason(R) are true, but Reason(R)are true, but Reason(R) is not the correct explanation of the Assertion(A).

(c) Assertion (A) is true, but Reason(R) is false.

(d) Assertion(A) is false, but Reason(R) is true.

19. Assertion(A):- If product of two numbers is 5780 and their HCF is 17,then their LCM is 340.

　　Reason(R):- HCF is always a factor of LCM.

20. Assertion(A):If △ ABC and △PQR are congruent triangles ,then they are also similar triangles.

　　Reason(R):-All congruent triangles are similar but the similar triangles need not be congruent.

SECTION - B

This section comprises very short answer (VSA) type questions of 2 mark each.

21. Solve for x: $6x^2 + 11x + 3 = 0$

22. The fourth term of an AP is 11.The sum of fifth and seventh terms of the AP is 34.Find its common difference.

23.Find the ratio in which P(4,m) divides the line segment joining the points A(2,3) and B(6,-3).

Hence find m.

24.From the following distribution, find the median.

Classes	500-600	600-700	700-800	800-900	900-1000
Frequency	36	32	32	20	30

25. Prove that $\sqrt{\dfrac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$

SECTION - C

This section comprises short answer(SA) type questions of 3 marks each.

26. Show that $\dfrac{3+\sqrt{7}}{2}$ is irrational number, given that $\sqrt{7}$ is an irrational.
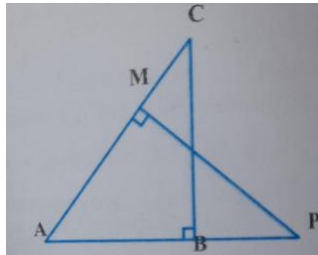
27.If 2x+y=23 and 4x-y=19 find the value of (5y-2x) and $(\dfrac{y}{x} - 2)$.

28.A train travels 80 km at a uniform speed. If the speed had been 9km/hr more, it would have taken 1

hour less for the same journey. Find the speed of the train.

29 .In figure ABC and AMP are two right triangles, right angled at B and M respectively. Prove that:

(i) △ABC~△AMP

(ii) $\dfrac{CA}{PA} = \dfrac{BC}{MP}$

30 .In ΔOPQ right angled at P, OP =7cm and OQ -PQ =1 cm. Determine the value of sin Q and cos Q .

31.A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsules is 5mm. Find its surface area.

SECTION - D

This section comprises long answer(LA) type questions of 5 marks each.

32.The mean of the following frequency distribution is 62.8 and the sum of all the frequencies is 50.

Compute the missing frequency f1 and f2 .

Classes	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	F1	10	F2	7	8

33.(a) Find the zeroes of a quadratic polynomial $2x^2 + 3x - 14$ and verify the relationship

between the zeroes and its coefficients.

(b).If α and β are zeroes of the polynomial $f(x) = px^2 - 2x + 3p$ and $\alpha + \beta = \alpha\beta$ find the values of P .

34.The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30^0 than when it is 60^0. Find the height of the tower.

35.In the given figure, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents drawn at P and Q intersect at a point T. Find the length of TP.
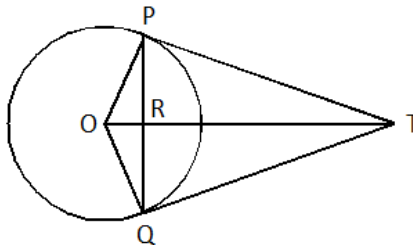

SECTION - E

This section comprises 3 case study based questions of 4 marks each.

Case study-1

36. Ayush starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office. (Assume that all distances covered are in straight lines and co-ordinates are in km). If the house is situated at (2,4), bank at (5,8),school at (13,14) and office at (13,26) and co-ordinates are in km.
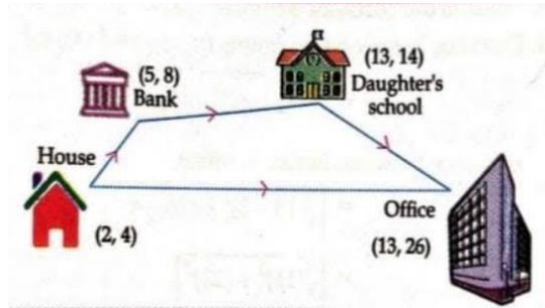
Answer the following questions :-

a) What is the distance between house and bank?

(a) 8 km   (b) 5 km   (c) 6 km   (d) 9 km

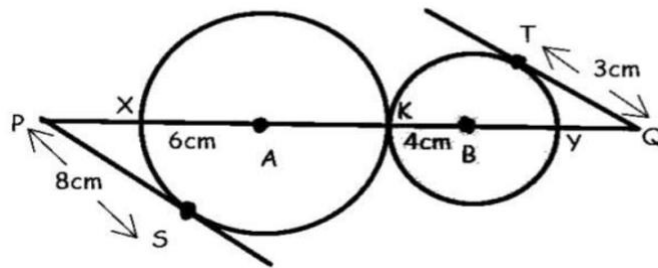b) What is the distance between bank and Daughter's school?

(a) 10 km   (b) 12 km   (c) 8 km   (d) 6 km

c) What is the total distance travelled by Ayush to reach the office?

(a) 12 km   (b) 10 km   (c) 27 km   (d) 30 km

Case Study -2

37. A student draws two circles that touch each other externally at point K with centers A

and B and radii 6cm and 4cm respectively, as shown in the figure.

Based on the above information, answer the following questions

(a) The value of PA is
    (a) 10cm   (b) 5cm   (c) 13cm   (d) can't determined
(b) The value of BQ is
    (a) 4cm   (b) 5cm   (c) 6cm   (d) 18cm
(c) The value of PK is
    (a) 13cm   (b) 15cm   (c) 16cm   (d) 18cm

Case Study-3

38. A horse is tied to a peg at one corner of a square shaped grass field of sides 15 m by means of a 5m long rope.

(a) What is the area of the grass field ?

(a) 225m²   (b) 235m   (c)255m²   (d) 15m

(b) The area of that part of the field in which the horse can graze.

   (a) 19.625m² (b)19.265m²   (c)19m²   (d)8.5m²

(c) The grazing area if the rope were 10 m long instead of 5m

   (a) 7.85m²   (b) 785m² (c) 225m²   (d)78.5m²

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