This question paper contains 4 printed pages.

THE H.B.KAPADIA NEW HIGH SCHOOL

ENGLISH MEDIUM

SA–2, February-2016

An ISO 9001 : 2008 Certified Institution

Standard	: X	Marks	: 50
Subject	: Maths (12)	Duration	: 1 hour

PART - A

Instructions:

- **There are 50 multiple choice questions in this paper.**
- **All questions are compulsory.**
- **Figures to the right indicate marks.**

1. In right angled of ΔABC, $m\angle B = 90$. If AC = 20 and $m\angle C = 30$, then BC =.....
   (A) 20 (B) 40 (C) 10 (D) 17.3
2. The points of contact of the tangents from an exterior point P to the circle with centre O are A & B. If $m\angle OPB = 30$, then $m\angle AOB$ = ...
   (A) 30 (B) 60 (C) 90 (D) 120
3. $\overrightarrow{PA}$ and $\overrightarrow{PB}$ are tangents to ⊙(0, 5). If OP = 13 then PB = ...
   (A) 5 (B) 10 (C) 12 (D) 13
4. A tangent to a circle is perpendicular to ..... drawn from the point of contact.
   (A) a line (B) a radius (C) a ray (D) a line segment
5. Tangent to the circle intersects the circle in .....
   (A) two points (B) three points
   (C) four points (D) one and only one point
6. The area of a minor sector of ⊙(0, 10) is 150. The length of the corresponding are is ..... ($\pi = 3.14$)
   (A) 30 (B) 60 (C) 90 (D) 15
7. In ⊙(0, 4), $\overset{\frown}{ACB}$ is .....
   (A) 3π (B) 2π (C) π (D) 4π
8. The radius of a circle is 3.5 cm. The area of the minor sector formed by two perpendicular radii of that circle is ..... cm^2.
   (A) 19.25 (B) 9.625 (C) 38.5 (D) 77
9. In a circle with radius 6.3 cm, a minor arc subtends an angle of measure 40 at the centre. The area of the minor sector corresponding to that arc is ..... cm^2.
   (A) 27.72 (B) 6.93 (C) 46.2 (D) 13.86
10. The ratio of the areas of the circles with radii 8 cm and 12 cm is .....
    (A) 2 : 3 (B) 4 : 9 (C) 1 : 4 (D) 2 : 9

11. On dividing $(5k + 1)^2$ by 5, the remainer is ..... $(k \in N)$

(A) 2 (B) 0 (C) 3 (D) 1

12. 0.0222 ... is .....

(A) a rational number (B) an irrational number

(C) an integer number (D) a natural number

13. The maximum number of zeros of a polynomial having degree k + 1 can be .....

(A) k (B) k + 1 (C) k – 1 (D) k + 2

14. If α_1 β and γ are zeros of $p(x) = ax^3 + bx^3 + cx + d$; $a \neq 0$, then $\frac{1}{\alpha}+\frac{1}{\beta}+\frac{1}{\gamma}=$ .....

(A) $\frac{-c}{a}$ (B) $\frac{-c}{d}$ (C) $\frac{c}{d}$ (D) $\frac{-b}{d}$

15. If the zeros of polynomial $p(x) = ax^2 - 11x + 3$ is 1, then a = ...

(A) 3 (B) 4 (C) 8 (D) –3

16. The sum of the zeros of $p(x) = 3x^2 + 5x - 2$ is .....

(A) $\frac{3}{5}$ (B) $\frac{-3}{5}$ (C) $\frac{5}{3}$ (D) $\frac{-5}{3}$

17. The solution of pair of equation x + 2 = 0 and y – 1 = 0 is (x, y) = ...

(A) {(2, –1)} (B) (–2, 1) (C) (1, –2) (D) {(–1, 2)}

18. The sum of two numbers is 10 and difference of them is 2. Then the smaller number of these two is .....

(A) 2 (B) 4 (C) 6 (D) 8

19. 

Pair of equation in the above figure is .....

(A) 3x = 4y, x + 2y = 10 (B) x = y, 2x + y = 10

(C) 2x = y, 2x + y = 10 (D) x = 2y, x + 2y = 10

20. The quadratic equation of variable x having roots -8 and 8 is

(A) $x^2 - 8 = 0$ (B) $x^2 - 8x + 16 = 0$

(C) $x^2 = 16$ (D) $x^2 = 64$

21. The volume of cone with radius 2 cm and height 6 cm is ..... cm^3.

(A) 8 π (B) 12 π (C) 14 π (D) 16 π

22. The radius of the base of a cylinder is 7 cm. Then, the area of its base is .....cm^2.

(A) 77 (B) 154 (C) 308 (D) 44

23. The volume of a sphere with radius 1.5 cm is ..... cm^3.

(A) 1.5 π (B) 3 π (C) 4.5 π (D) 6 π

24. 1 m^3 = ... cm^3.

(A) 1 (B) 10^2 (C) 10^3 (D) 10^{-6}

25. If $\bar{x} = 21.44$ and z = 19.13, then M = ...

(A) 21.10 (B) 19.67 (C) 20.10 (D) 20.67

26. For a given frequency distrubution, the frequencies of first, second and third class are 8, 15 and 18 respectively. Then, the cumulative frequency of the third class is .....

(A) 23 (B) 33 (C) 41 (D) 26

27. If $M - \bar{x} = 2$ and z = 20.5, then median M = ...

(A) 16.5 (B) 18.5 (C) 19.5 (D) 17.5

28. The sum of the probabilities of all the elementary events of an experiment is .....

(A) 0 (B) 0.2 (C) 1 (D) 0.8

29. There are 6 green, 5 red and 4 blue identical balls in a bag. One ball is drawn at random from the bag. The probability that the ball drawn is not red is .....

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{11}{15}$ (D) $\frac{3}{5}$

30. A balanced dice is rolled once. Then, the probability that the number on the die is a prime number is .....

(A) $\frac{1}{3}$ (B) $\frac{1}{6}$ (C) $\frac{1}{6}$ (D) 1

31. The speed of a motor boat in still water is x km/hr and the speed of the current of river be 5 km/hr. Where x > 5, then time taken to cover the distance of y km in down stream is .....

(A) $\frac{x+5}{y}$ (B) $\frac{y}{x+5}$ (C) $\frac{y}{x-5}$ (D) $\frac{x-5}{y}$

32. If the value of discriminant of quadratic equation $x^2 - 10x + (2k-1) = 0$ is 40, then k = ...

(A) 15 (B) 8 (C) 7 (D) 10

33. If one of the roots of $kx^2 - 7x + 3 = 0$ is 3, then k = ...

(A) –2 (B) 3 (C) –3 (D) 2

34. For the A.P. $\frac{3}{2}, \frac{7}{2}, \frac{11}{2}, \frac{15}{2}$..... the common difference is .....

(A) $\frac{1}{2}$ (B) $\frac{3}{2}$ (C) 2 (D) –2

35. If $T_3 = 8$, $T_7 = 24$ then T_{10} = ...

(A) –4 (B) 28 (C) 32 (D) 36

36. The .....th term of the A.P. 8, 11, 14, 17 ..... is 272.

(A) 72 (B) 73 (C) 70 (D) 89

37. In ΔXYZ and $\Delta PQR, XYZ \leftrightarrow PQR$ is a similarity XY = 12, YZ = 8, ZX = 16, PR = 8 so, PQ + QR = ...

(A) 20 (B) 10 (C) 15 (D) 9

38. □ABCD is a trapezium in which $\overline{AD}$ || $\overline{BC}$, $\overline{AC} \cap \overline{BD}$ = {P}. If PD = 9, PA = 5 and PB = 7.2 then AC = ...

(A) 4 (B) 9 (C) 12 (D) 13

39. In △ABC, medians $\overline{AD}$ and $\overline{BE}$ intersect at G. A line through G and parallel to DE intersects $\overline{AC}$ at K. If EK = 2.8 then AC = ...

(A) 3.6 (B) 10.8 (C) 16.8 (D) 7.2

40. In ΔPQR, m$\angle$Q = 90 and $\overline{QM}$ is an altitude. If PM = 8 and RM = 12, then QM = ...

(A) $4\sqrt{6}$ (B) $8\sqrt{3}$ (C) 10 (D) 18

41. In ΔABC, $m\angle B$ = 90 , AB = BC. Then AB : AC = ...

(A) 1 : 3 (B) 1 : 2 (C) 1: $\sqrt{2}$ (D) $\sqrt{2}$: 1

42. The length of a diagonal of a square is 6 Then, its area is .....

(A) 36 (B) 30 (C) 24 (D) 18

43. If A(l, 2) and B(3, –2) are given points, then ..... is the midpoint of $\overline{AB}$.

(A) P (2, 1) (B) P (–1, 0) (C) P(2, 0) (D) P (0, 0)

44. The co-ordinates of A and B are (3, –6) and (–2, –1). The co-ordinates of P dividing $\overline{AB}$ from A in ratio 3:2 are .....

(A) (4, –5) (B) (2, –5) (C) (1, –4) (D) (0, –3)

45. In the vertices of □ABCD are A(l, 3), B(4, 3), C(4, 5) and D(l, 5) then □ABCD is.....

(A) square (B) rhombus (C) rectangle (D) trapezium

46. If P(x_1, y_1) and Q(x_2, y_2) are the given points. If $\overline{PQ}$ is parallel to Y-axis then .....

(A) $x_1 = x_2$ (B) $x_1 = y_1$ (C) $x_2 = y_2$ (D) $y_1 = y_2$

47. If sec 4A = cosec(A – 20), where 4A is a measure of acute angle then the value of A is .....

(A) 45 (B) 70 (C) 30 (D) 22

48. If $\cos^2 45 - \cos^2 30 = x \cos 45 \sin 45$, then x = ...

(A) 2 (B) $\frac{3}{2}$ (C) $\frac{-1}{2}$ (D) $\frac{3}{4}$

49 $\frac{\sec\theta - 1}{\sec\theta + 1} =$ .....

(A) tan θ (B) $\frac{1-\sin\theta}{1+\sin\theta}$ (C) $\frac{\cos ec\theta - 1}{\cos ec\theta + 1}$ (D) $\frac{1-\cos\theta}{1+\cos\theta}$

50. The angle of depression of a ship from the top of a tower of height 30 m has measure 60. Then, the distance of the ship from the base of the tower is .....

(A) 10 (B) 30 (C) $10\sqrt{3}$ (D) $30\sqrt{3}$

BEST OF LUCK

This question paper contains 2 printed pages.

THE H.B.KAPADIA NEW HIGH SCHOOL

ENGLISH MEDIUM

SA–2, February-2016

An ISO 9001 : 2008 Certified Institution

Standard	: X	Marks	: 50
Subject	: Maths (12)	Duration	: 2 hours
		Date	: 01/02/2016

Part - B

Instructions :

- **There are four sections in this question paper.**
- **All questions are compulsory.**

SECTION-A

- **Answer the following in short : (2 marks each)** **[16]**

1. Find the square root of $9 + 2\sqrt{14}$.
2. Obtain the quotient and remainder by dividing $p(x) = 2x^3 - 13x^2 + 23x - 12$ by $2x - 3$.
3. How many terms of 7, 11, 15 ..... add upto 990 ?

OR

3. If m^{th} term of an A.P is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$ then find the value of mn^{th} term.
4. In ΔPQR, $\angle P$ is right angle and PM is an altitude. If PQ = 8 and PR = 6 find PM.
5. Find the area of ΔABC, having the vertices A(4, 2), B(3, 9) and C(10, 10).
5. Prove that $\cos^6\theta + \sin^6\theta = 1 - 3\cos^2\theta\sin^2\theta$.

OR

Find the value of x, in $x \sin^2 45° \cos 60° = \frac{\cot^2 30 \sec 60}{\tan^2 45 \operatorname{cosec} 30}$.

7. Find the mean by assumed mean.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	4	8	3	20	3	4	8

8. Solve $\frac{x}{a} + \frac{y}{b} = a + b$ and $\frac{x}{a^2} + \frac{y}{b^2} = 2$ by ellimination method,

SECTION-B

- **Answer the following in short : (3 marks each)** **[12]**

9. Solve $ax^2 + bx + c = 0$ using the method of completing the square.

10. A temple stands under a bridge of length l, spanning over the valley. If α and β are the angle of depression of the top of the temple, as observed from the twro ends of the bridge, prove that the bridge is at the height of $\frac{l}{\cot\alpha + \cot\beta}$ above the top of the temple.
11. Two balanced dice are thrown once. Find the probability that the sum of number on two dice are (i) < 2 (ii) > 10.
12. Find the mode of this data.

Hrs	1–3	3–5	5–7	7–9	9–11
Students	7	2	8	2	1

OR

12. The mean of the following frequency distribution of 100 observations is 148. Find the missing frequencies f_1 and f_2 :

Class	0-49	50-99	100-149	150-199	200-249	250-299	300-349
Frequency	10	15	f_1	20	15	f_2	2

SECTION-C

- **Answer the following : (4 marks each)** **[12]**

13. Prove that a tangent to a circle is perpendicular to the radius drawn from the point of contact.
14. In □ (0, r) a 10 cm long chord substends right angle at the centre. Find the area of minor segment and major segment corresponding to the chord. (π = 3.14)
15. A metallic sphere with radius 15 cm is melted and recast into a wire with diameter 1 cm. Find the length of wire.

OR

15. An oil funnel made of tin sheet consists of a 20 cm long cylindrical portion attached to frustum of a cone. If the total height is 40 cm, diameter of the cylindrical portion is 14cm and the diameter of the top of the funnel is 24 cm, find the area of the tin sheet required to make the funnel.

SECTION-D

- **Answer the following : (5 marks each)** **[10]**

16. A circle with centre O and radius 3 cm is given. Point P is such that OP = 7 cm. Draw the tangents to the circle through P.
17. State and prove fundamental theorem of proportionality.

OR

17. Prove that Areas of two similar triangles are proportional to squares of corresponding sides.

BEST OF LUCK