Sun Tuition Center -9629216361
model question paper

STD : X

SUB : MATHS

TIME : 3 HRS

MARKS : 100

PART - I

I. Answer all the questions. $14 \times 1 = 14$

1. If the ordered pairs (a+2, 4) and (5, 2a + b) are equal than (a, b) is
   a. (2, -2)   b. (5, 1)   c. (2, 3)   d. (3, -2)

2. Using Euclid's division lemma, if the cubes of any positive integers is divided by 9 then the possible remainders are
   a. 0, 1, 8   b. 1, 4, 8   c. 0, 1, 3   d. 1, 3, 5

3. If 6 time of the 6th term of an A.P is equal to 7 times the 7th term then the 13th term of the A.P is
   a. 0   b. 6   c. 7   d. 13

4. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is

   a. $\frac{9y}{7}$ b. $\frac{9y^3}{21y-21}$ c. $\frac{21y^2-42y+21}{3y^3}$ d. $\frac{7(y^2-2y+1)}{y^2}$

5. The solution of $(2x-1)^2 = 9$ is equal to
   a. -1   b. 2   c. -1, 2   d. none

6. In ΔLMN, $\lfloor L = 60°$, $\lfloor M = 50°$. If Δ LMN ~ΔPQR then the value of $\lfloor R$ is
   a. 40°   b. 70°   c. 30°   d. 110°

7. The area of triangle formed by the points (-5, 0), (0, -5) and (5, 0) is
   a. 0 sq. units   b. 25 sq. units   c. 5 sq. units   d. None

8. A straight line has equation 8y = 4x + 21. Which of the following is true?
   a. The slope is 0.5 and y – intercept 2.6   b. The slope is 0.5 and y – intercept 1.6
   c. The slope is 5 and y – intercept 1.6   d. The slope is 5 and y – intercept 2.6

9. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}$: 1, then the angle of elevation of the sun has measure.
   a. 45°   b. 30°   c. 90°   d. 60°

10. The height of a right circular cone whose radius 5 cm and slant height is 13cm will be
    a. 12 cm   b. 10 cm   c. 13 cm   d. 5 cm

11. Which of the following is incorrect?
    a. P(A)>1   b. 0 $0 \le P(A) \le 1$ c. P(A) = 0   d. $P(A) + P(\overline{A}) = 1$

12. A quadratic polynomial whose one zero 5 and sum of the zeroes is 0 is given by
    a. $x^2 - 25$ b. $x^2 - 5$ c. $x^2 - 5x$ d. $x^2 - 5x + 5$

13. If the points (0, 0) (a , 0) and (0, b) are collinear, then
    a. a = b   b. a $\div$ b = 0   c. ab = 0   d. a $\ne$ 0

14. When three coins are tossed, the probability of getting the same face on all the three coins is
    a. 1/8   b. 1/4   c. 3/8   d. 1/3

PART – II

Answer the following questions. Question no. 28 is compulsory. $10 \times 2 = 20$

15. If B x A = {-2, 3), (-2, 4), (0, 3), (0, 4), (3, 3), (3, 4) find A and B.

16. Let A = {1, 2, 3, 7} and B = { 3, 0, -1, 7}, which of the following are relation from A to B?
    (i) R_1 = {(2, 1)}, (7, 1)}   (ii) R_2 = {(2, -1), (7, 7), (1, 3)}

17. Is 7 x 5 x 3 x 2 + 3 a composite number? Justify your answer.

18. Find the number of terms in the A.P 3, 6, 9, 12 .... 111.

19. Simplify $\frac{5t^3}{4t-8} \times \frac{6t-12}{10t}$

20. Solve the quadratic equation $2x^2 - 5x + 2 = 0$ by formula method.

21. In ΔABC, D and E are points on the sides AB and AC respectively such that
    DE || BC. If $\frac{AD}{DB} = \frac{3}{4}$ and AC = 15cm find AE.

22. Find the area of the triangle formed by the point. (1, -1), (-4, 6) and (-3, -5).

23. Find the slope of a line joining the given points (-6, 1) and (-3, 2).

24. Find the intercepts made by the line 4x – 9y + 36 =0 on the coordinate axes.

25. From the top of a tree of height 13m the angle of elevation and depression of the top and bottom of another tree are 45° and 30° respectively. Find the height of the second tree. ($\sqrt{3}$ = 1.732).

26. The external radius and the length of a hallow wooden log are 16cm and 13cm respectively. If its thickness is 4 cm then find its T.S.A.

27. What is the probability that a leep year selected at random will contain 53 Saturdays.

28. The roots of the equation $x^2 + 6x - 4 = 0$ are α, β. Find the quadratic equation whose roots are α^2 and β^2.

(OR)

A solid sphere and a solid hemisphere have equal total surface area. Prove that the ratio of their volume is $3\sqrt{3}$: 4.

PART – III

III. Answer the following questions. Question No. 42 is compulsory.   10 x 5 = 50

29. Let A = The set of all natural numbers less than 8, B = The set of all Prime numbers less than 8, C = the set of even prime number. Verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$.

30. Represent the given relation $\{(x, y) / y = x + 3, x, y$ are natural numbers $< 10\}$ by
    a) an arrow diagram,   b) a graph and   c) a set in roster form.

31. If $P_1^{x_1} \ P_1^{x_1} \times P_2^{x_2} \times P_3^{x_3} \times P_4^{x_4} = 113400$ where P_1, P_2, P_3, P_4 are primes in ascending order and x_1, x_2, x_3, x_4 are integers, find the values of P_1, P_2, P_3, P_4 and x_1, x_2, x_3, x_4.

32. Find the values of 'a' and 'b' if the $4x^4 - 12x^3 + 37x^2 + bx + a$ is a perfect squares.

33. Solve: $x + y + z = 5; 2x - y + z = 9, \ x - 2y + 3z = 16$.

34. A ball rolls down a slope and travels a distance $d = t^2 - 0.75t$ feet in t seconds. Find the time when the distance travelled by the ball is 11.25 feet.

35. State and prove Pythagoras theorem.

36. Find the area of the quadrilateral whose vertices are at (-9, 0), (-8, 6), (-1, -2) and (-6, -3).

37. Without using Pythagoras theorem, show that the points (1, -4), (2, -3) and (4, -7) form a right angled triangle.

38. An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats. ($\sqrt{3}$ = 1.732).

39. A line makes positive intercepts on coordinates axes whose sum is 7 and it passes through (-3, 8). Find the equation.

40. The Frustum shaped outer position of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if the cost of paining 1 sq. cm is Rs. 2.
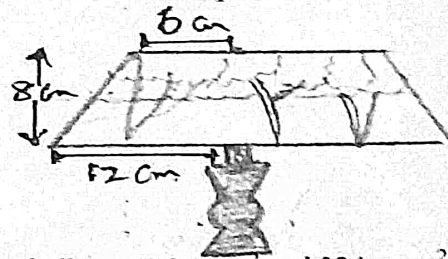
41. The outer and the inner surface areas of a spherical copper shell are 576 π cm² and 324 π cm² respectively. Find the volume of the material required to make the shell.

42. From a well shuffled pack of 52 cards, one card is drawn at random. Find the probability of getting (i) red card (ii) heart card (iii) red King (iv) face card (v) number card

43. In an A.P. sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

(OR)

The angles of elevation and depression of the top and bottom of a lamp post from the top of a 66m high apartment are 60° and 30° respectively. Find
(i)   The height of the lamp post
(ii)   The difference between height of the lamp post and the apartment .
(iii)   The distance between the lamp post and the apartment. ($\sqrt{3}$ = 1.732).

PART – IV

IV. Answer all the questions: 8 x 2 = 16

44. Draw the two tangents from a point which is 10cm away from the centre of a circle of radius 5cm. Also, measure the length of the tangents.
    Draw a triangle ABC of base BC = 5.6cm, $\angle A = 40°$ and the bisector of $\angle A$ meets BC at D such that CD = 4 cm.

45. Graph the following quadratic equation $x^2 - 4x + 4 = 0$ and state their nature of solutions

(OR)

Draw the graph of $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$.

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STD : X
SUB : MATHEMATICS
model question paper
TIME : 3 HRS
MARKS : 100

PART – I

Choose the correct answer from the given four alternatives and write the option code and corresponding answer.
$14 \times 1 = 14$

1. If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is ....
   a. 1   b. 2   c. 3   d. 6

2. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
   a. 3   b. 5   c. 8   d. 11

3. The sum of the exponents of prime factors in the prime factorization of 1729 is
   a. 1   b. 2   c. 3   d. 4

4. Graph of a quadratic equation is
   a. straight line   b. circle   c. parabola   d. hyperbola

5. The square root of $\dfrac{256x^8 y^4 z^{10}}{25x^6 y^6 z^6}$ is equal to

   a. $\dfrac{16}{5}\left|\dfrac{x^2 z^4}{y^2}\right|$ b. $\dfrac{16}{5}\left|\dfrac{xz^2}{y}\right|$ c. $\dfrac{16}{5}\left|\dfrac{y^2}{x^2 z^4}\right|$ d. $\dfrac{16}{5}\left|\dfrac{y}{xz^2}\right|$

6. If in $\triangle ABC$, $DE \parallel BC$. $AB = 3.6$cm, $AC = 2.4$cm and $AD = 2.1$cm the length of AE is
   a. 1.4cm   b. 1.8cm   c. 1.2cm   d. 1.05cm

7. How many tangents can be drawn to the circle from an exterior point?
   a. one   b. two   c. infinite   d. zero

8. The area of triangle formed by the points (-5, 0) (0, -5) and (5,0) is
   a. 0 sq. units   b. 25sq. units   c. 5. Sq. units   d. none of these

9. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$, then the angle of elevation of the sun has measure.
   a. 45°   b. 30°   c. 90°   d. 60°

10. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
    a. 12cm   b. 10cm   c. 13cm   d. 5cm

11. The total surface area of a hemi-sphere is how much times the square of its radius.
    a. π b. 4π c. 3π d. 2π

12. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is ....
    a. 3/10   b. 7/10   c. 3/9   d. 7/9

13. The perimeter of a triangle formed by the points (0, 0) (1, 0) and (0, 1) is
    a. $\sqrt{2}$ b. 2   c. $2 + \sqrt{2}$ d. $2 - \sqrt{2}$

14. The GCD of a^m, a^{m+1}, a^{m+2} is
    a. a^m b. a^{m+1} c. a^{m+2} d. 1

PART – II

Answer any 10 questions. Question No. 28 is compulsory.
$10 \times 2 = 20$

15. If $A = \{1, 3, 5\}$ $B = \{2, 3\}$ then find $A \times B$ and $B \times A$.

16. For the given relation $R = \{(1, 3) (2, 5) (4, 7) (5, 9) (3,1)\}$ write the domain and Range.

17. If $800 = a^b \times b^a$ then find the value of a and b.

18. Find the square root $\dfrac{400x^4 y^{12} z^{16}}{100x^8 y^4 z^4}$

19. Determine the nature of the root of $x^2 - x - 1 = 0$.

20. If $\triangle ABC \sim \triangle DEF$ such that area of $\triangle ABC$ is 9cm^2 and the area of $\triangle DEF$ is 16cm^2 and BC = 2.1 cm. Find the length of EF.

21. Find the equation of the line passing through the point (3, -4) having slope = -5/7

22. Find the area of the triangle whose vertices are (-3, 5) (5, 6) and (5, -2).

23. From the top of a rock $50\sqrt{3}$ m high the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.

24. Find the angle of elevation of the top of a tower from a point on the ground which is 30m away from the foot of a tower of height 10 $\sqrt{3}$ m.

25. Find the diameter of a sphere whose surface area is $154m^2$.
26. Write the sample space for selecting two balls from a bag containing 6 balls numbered 1 to 6 using tree diagram.
27. In two concentric circles a chord of length 16cm of larger circle becomes tangent to the smaller circle whose radius is 6cm. Find the radius of the larger circle.
28. a. If the highest common factor of 210 and 55 is expressible in the form $55x - 325$ find x.

(OR)

b. The heights of two circular cones are in the ratio 1 : 2 and the perimeters of their bases are in the ratio 3 : 4. Find the ratio of their volumes.

PART – III

Answer any 10 questions. Question No. 42 is compulsory. $10 \times 5 = 50$

29. Let $A = \{x \in N \mid 1 < x < 4\}$, $B = \{x \in W \mid 0 \le x < 2\}$ and $C = \{x \in N \mid x < 3\}$, then verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$

30. Let X = {1, 2, 3, 4, 5} Y = {1, 3, 5, 7, 9} which of the following are relation from X to Y?
    (i) $R_1 = \{(1, 3) (2, 4) (3, 5) (4,6) (5, 7)\}$
    (ii) $R_2 = \{(1, 1) (2, 1) (3, 3) (4, 3) (5, 5)\}$
    (iii) $R_3 = \{(1,3) (2, 5) (4, 7) (5,6) (3, 1)\}$

31. Use Euclid's Division Algorithm to find the highest common factor of 396, 504, and 636.
32. Find the square root of $37x^2 - 28x^3 + 4x^4 + 42x + 9$
33. If α and β are the $2x^2 - 7x + 5 = 0$ find the values of i) $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$ (ii) $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

34. State and prove Thales theorem.
35. Find the area of the quadrilateral formed by the points (8, 6) (5, 11) (-5, 12) and (-4, 3).
36. A line makes positive intercepts on co-ordinate axes whose sum is 7 and its passes through (-3, 8) find its equation.
37. From the top of the tower 60m high the angles of depression of the top and bottom of a vertical lamp post are observed to be 38° and 60° respectively. Find the height of the lamp post ($\tan 38° = 0.7813°$, $\sqrt{3} = 1.732$)
38. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14cm and height of the vessel is 13cm. Find the capacity of the vessel.
39. If the circumference of a conical wooden piece is 484cm then find its volume when its height is 105cm.
40. A bag contains 5 red balls, 6 white balls, 7 green balls, 8 black balls. One ball is drawn at random from the bag. Find the probability that ball drawn is
    (i) white   (ii) black or red   c. not white   d. neither white nor black
41. A status 1.6m tall stands on the top of a pedestal from a point on the ground the angle of elevation of the top of the statue is 60 and from the same point the angle of elevation of the top of the pedestal is 40. Find the height of the pedestal. ($\tan 40 = 0.8391$ $\sqrt{3} = 1.732$).

42. a. If $A = \dfrac{x}{x+1}, B = \dfrac{1}{x+1}$ prove that $\dfrac{(A+B)^2 + (A-B)^2}{A \div B} = \dfrac{2(x^2+1)}{x(x+1)^2}$

(OR)

b. Show that the angle bisectors of a triangle are concurrent.

PART – IV $2 \times 8 = 16$

43. Draw a tangent to the circle from the point P having radius 3.6cm and centre at a point P is at the distance 7.2 cm from the centre.

(OR)

b. construct a triangle similar to a given triangle PQR with its sides are equal to 2/3 of the corresponding sides of the triangle PQR (Scale factor 2/3 < 1).

44. a. Draw the graph of $x^2 + x - 12 = 0$ and state the nature of their solution.

(OR)

b. Draw the graph y = (x-1) (x+3) and hence use it to solve $x^2 - x - 6 = 0$.
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Sun Juition Center -9629216361
model question paper

STD : X   TIME : 2.30 HRS
SUB : MATHS   MARKS : 100

PART – I
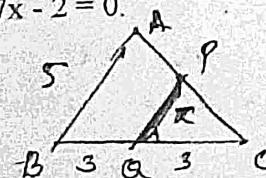   14 x 1 = 14

I. . Choose the correct answer:

1. If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is ....
   a. 1   b. 2.   c. 3   d. 6

2. If 6 times of 6th term of an A.P. is equal to 7 times the 7th term, then the 13th term of the A.P is
   a. 0   b. 6   c. 7   d. 13

3. An A.P consists of 31 terms. If its 16th term is 'm', then sum of all the terms of this A.P is
   a. 16m   b. 62m   c. 31m   d. 31/2m

4. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the x-axis is...
   a. 0   b. 1   c. 0 or 1   d. 2

5. If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
   a. 3   b. 5   c. 6   d. 8

6. In ΔLMN, $\angle L = 60°$, $\angle M = 50°$. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is
   a. 40°   b. 70°   c. 30°   d. 110°

7. In a given figure ST || QR, PS = 2 cm and SQ = 3cm. Then the ratio of the area of ΔPQR to the area of ΔPST is
   a. 25:4   b. 25:7

   c. 25:11   d. 25:13

8. The area of triangle formed by the points (-5,0), (0,-5) and (5,0) is
   a. 0 sq. units   b. 25 sq. units   c. 5 sq. units   d. none of these

9. The slope of the line is $\dfrac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of $\overline{PQ}$ is
   a. $\sqrt{3}$ b. $-\sqrt{3}$ c. $\dfrac{1}{\sqrt{3}}$ d. 0

10. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}$: 1, then the angle of elevation of the sun has measure.
    a. 45°   b. 30°   c. 90°   d. 60°

11. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
    a. 12cm   b. 10cm   c. 13cm   d. 5cm

12. The total surface area of a cylinder whose radius is 1/3 of its height is
    a. $\dfrac{9\pi h^2}{8}$ sq.uts   b. $24\pi h^2$ sq.uts   c. $\dfrac{8\pi h^2}{9}$ sq.uts   d. $\dfrac{56\pi h^2}{9}$ sq.uts

13. Which of the following is incorrect?
    a. P(A)>1   b. $0 \le P(A) \le 1$ c. $P(\phi) = 0$ d. $P(A) + P(\overline{A}) = 1$

14. The probability of getting a job for a person is $\dfrac{x}{3}$. If the probability of not getting the job $\dfrac{2}{3}$. Then the value of x is
    a. 2   b. 1   c. 3   d. 1.5
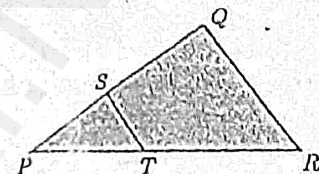
PART – B

II. Answer the following questions. Questions No. 28 is compulsory: 10 x 2 = 20

15. If A = {2, -2, 3}, B = {1, -4} then find   (i) A x B, (ii) B x A

16. Find all positive integers whixh when divided by 3 and leaves remainder 2.

17. Find the first terms and common difference of the AP, whose nth term is, tn = -3 + 2n.

18. Find the LCM of the expression , $p^2 - 3p + 2$, $p^2 - 4$.

19. Solve the quadratic equation by factorization method $4x^2 - 7x - 2 = 0$.

20. Is $\Delta ABC \sim \Delta PQC$? If so find x.

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21. Determine the quadratic equation, whose sum and product of roots are -9, 20.
22. Find the area of the triangle formed by the points (-10, -4), (-8, -1) and (-3, -5)
23. Find the slope of a line joining the points (5, $\sqrt{5}$) and (0, 0).
24. From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.
25. The external radius and the length of a hollow wooden log are 16cm and 13cm respectively. If the thickness is 4cm then find its T.S.A.
26. Two dice are rolled once. Find the probability of getting (i) a doublet (ii) the sum as 1
27. A and B are two events such that P(A) = 0.42   P(B) = 0.48 then find
    i) P(not A)   ii) P (not B).
28. Find the 19th term of an Ap, -11, -15, -19, ...

    (OR)

    Find the square root of $4x^2 + 20x + 25$.

PART – III

III. Answer the following questions. Question No. 42 is compulsory.
29. If A = {0, 1, 2}, B = {2, 3, 4}, C = {3,5} verify A x (B ∩ C) = (A x B) ∩ (A x C).
30. If a_1 = 1, a_2 = 1 and a_n = $2a_{n-1}$ + a_{n-2}, n ≥ 3, n ∈ N, then find first six terms of the sequence.
31. If ratio of 6th and 8th term of an A.P is 7 : 9. Find the ratio of 9th term to 13th term.
32. Solve the linear equations.
    $x - y + z = 5$
    $2x - y + z = 9$
    $x - 2y + 3z = 10$
33. Find the square root of $4x^4 - 28x^3 + 37x^2 + 42x + 9$.
34. State and prove Basic Proportionality Theorem.
35. Find the area of the quadrilateral whose vertices are (-9, 0), (-8, 6) (-1, -2) and (-6, -3).
36. If the points A (2,2), B(-2, -3), C(1, -3), D(x, y) form a parallelogram then find the values of x and y.
37. The top of a 15m high tower makes an angle of elevation of 60° with the bottom of an electronic pole and angle of elevation of 30° with the top of the pole. What is the height of the electric pole?
38. An aeroplane at an altitude of 1800m finds that two boats are sailing towards it in the same directions. The angle of depression of the boats as observed from the aeroplane is 60° and 30° respectively. Find the distance between the two boats. ($\sqrt{3}$ = 1.732)
39. A solid iron cylinder has T.S.A of 1848 m². Its C.S.A is five – sixth of its total surface Area. Find the radius and height of the cylinder.
40. Three fair coins are tossed together. Find the probability of getting.
    (i) all heads   (ii) atleast one tail   (iii) atmost one head   (iv) atmost two tails
41. Represent the given relation by
    a. An arrow diagram
    b. A graph
    c. A set in roster form
    R = { (x, y) / y = x + 3, x, y are natural numbers < 10}
42. a. Find the G.C.D of the polynomials.
    $x^4 - 3x^3 - x - 3, x^3 + x^2 - 5x + 3$

    (OR)

    b. Show that the given points form a right angled triangle and check whether they satisfies Pythagoras Theorem. A (1, -4), B(2, -3), C(4, -7)

PART – IV

IV. Answer the following questions:
43. Draw the two tangents from a point which is 5cm away from the centre of a circle of radius 3cm. Also measure the Length of the tangents.

    (OR)

    Construct ΔPQR, such that QR = 6.5 cm, ∠P = 60° and the altitude from P to QR is of length 4.5 cm.
44. Graph the following quadratic equation and state the nature of solution $x^2 - 9 = 0$

    (OR)

    Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$.