# BUDHA DAL PUBLIC SCHOOL PATIALA

PRE BOARD EXAMINATION (8 January 2024)

Class - X

Paper-Mathematics Standard (Set-A)

M.M. 80

Time: 3hrs.

**General Instructions:**

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

## Section-A

1. If HCF of 65 and 117 is expressible in the form $65\,m - 117$, then m is

   a) 1 b) 2 c) 3 d) 4

2. The number $\left(\sqrt{3}+\sqrt{5}\right)^2$ is

   a) not a real number b) a rational number

   c) an irrational number d) an integer

3. The product and the sum of the zeros of the polynomial $2x^2 - 2\sqrt{2}x + 1$ are respectively

   a) $\frac{1}{2}$ *and* $\sqrt{2}$ b) $-\sqrt{2}$ and $\frac{1}{2}$ c) $+\sqrt{2}$ and $\frac{1}{2}$ d) none of these

4. The value of $k$ for which the equation $3x - y + 8 = 0$ *and* $6x - ky = -16$ represent coincident lines is

   a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 2 d) $-2$

5. If the system of equations $2x + 3y = 7$ *and* $2px + (p+q)y = 28$ has infinitely many solutions, then

   a) $p = 2q$ b) $p + 2q = 0$ c) $q = 2p$ d) $q + 2q = 0$

6. If one end of the diameter of a circle is (2, 3) and the centre is (-2, 5), then the other end is

   a) (-6, 7) b) (6, -7) c) (0, 8) d) (0, 4)

7. In $\Delta ABC, AD$ is internal bisector of $\angle A$. If BD = 5 cm and BC = 7.5 cm then AB : AC is

   a) 2 : 1 b) 1 : 2 c) 2 : 3 d) 3 : 2

8. The length of diagonals of rhombus are 16 cm and 12 cm. The length of the side of rhombus is

a) 9 cm b) 10 cm c) 8 cm d) 20 cm

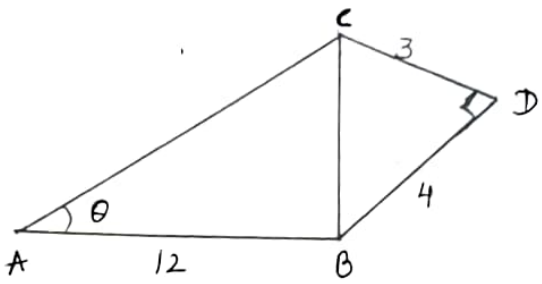
9. In the adjoined figure the value of $cos\ \theta$

a) $\frac{12}{13}$

b) $\frac{13}{12}$

c) $\frac{5}{12}$

d) $\frac{5}{13}$




10. If two tangents inclined at an angle of $60^0$ are drawn to a circle of radius 3 cm then the lengt of each tangent is equal to

a) $\frac{3\sqrt{3}\ cm}{2}$ b) $3\ cm$ c) $6\ cm$ d) $3\sqrt{3}cm$

11. The value of $tan^2 30^0 - 4\ sin^2 45^0$ is

a) 1 b) $\frac{7}{3}$ c) $\frac{-5}{3}$ d) $\frac{-11}{3}$

12. If the ratio of areas of two circles is 25 : 16, then the ratio of their circumference is

a) 16 : 25 b) 4 : 5 c) 5 : 4 d) 625 : 256

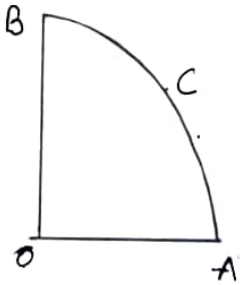
13. In the adjoining figure OACB is a quadrant of a circle of radius 7 cm. The perimeter of the quadrant is

a) 11 cm

b) 18 cm

c) 25 cm

d) 36 cm




14. If the base area of a cone is 51 $cm^2$ and the volume is 85 $cm^2$, then vertical height is

a) 3.5 cm b) 4 cm c) 4.5 cm d) 5 cm

15. If the class marks of a continuous frequency distribution are 22, 30, 38, 46, 54, 62 then the class corresponding to the class mark 46 is

a) 41.5 - 49.5 b) 42 - 50 c) 41 - 49 d) 41 - 50

16. Find the mode of the following distribution

| Age | 5 - 15 | 15 - 25 | 25 - 35 | 35 - 45 | 45 - 55 | 55 - 65 |
|---|---|---|---|---|---|---|
| No. of Covid cases | 6 | 11 | 21 | 23 | 14 | 5 |

a) 36.82 b) 36 c) 35 d) none of these

17. A girl walks 200 m towards East and then she walks 150 m towards North. The distance of the girl from the starting point is

a) 350 m b) 250 m c) 300 m d) 225 m

18. A bag contains 4 red, 3 green and 8 white balls. One ball is drawn at random. Find the probability of getting neither a red ball nor a white ball.

a) $\frac{4}{5}$ b) $\frac{1}{5}$ c) 1 d) none

**Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).**

**a) Both A and R are true and Reason (R) is correct explanation of A**
**b) Both A and R are true but Reason (R) is not the correct explanation of A**
**c) A is true but R is false**
**d) A is false but R is true**

19. Statement A (Assertion) : If one zero of the polynomial $5x^2 - 11x - (k - 3)$ is the reciprocal of the other, then $k = -2$

Statement R (Reason) : The product of zeros of the polynomial $ax^2 + bx + c; a \neq 0$ is $\frac{-b}{a}$

20. Statement A (Assertion) : If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

Statement R (Reason): Line segment joining the mid-points of any two sides of a triangle is parallel to the third side.

## Section - B

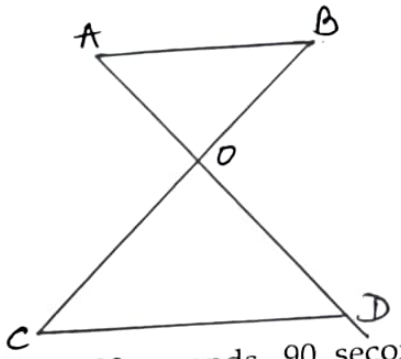
21. Solve for $x$ and $y$

$$mx - ny = m^2 + n^2$$
$$x + y = 2m$$

OR

If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 - 5x - 3$, then find the values of p and q.

22. The logs of iron table form two triangles as shown



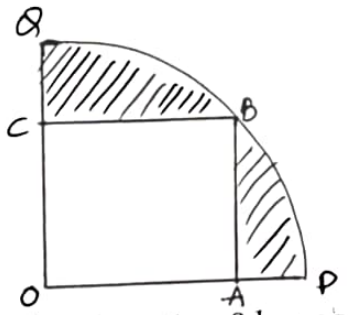

a) Prove $\Delta AOB \sim \Delta DOC$

b) If AO = 30 cm and OD = 45 cm,

then, find the perimeter $(\Delta AOB)$: perimeter $(\Delta DOC)$

23. Three bulbs red, green and yellow flash at intervals of 80 seconds, 90 seconds and 110 seconds. All three flash together at 8 : 00 a.m. At what time will be three bulbs flash altogether again.

24. A square OABC is inscribed in a quadrant OPBQ. If OA = 20 cm, find the area of the shaded region ($\pi = 3.14$).




25. Find the value of $k$ so that the equation $(k+4)x^2 + (k+1)x + 1 = 0$ has equal roots.

## Section – C

26. Prove that $\frac{\sin\theta}{\sec\theta + \tan\theta - 1} + \frac{\cos\theta}{\operatorname{cosec}\theta + \cot\theta - 1} = 1$

**OR**

If $\tan\theta = \frac{1}{\sqrt{5}}$, find the value of $\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta}$

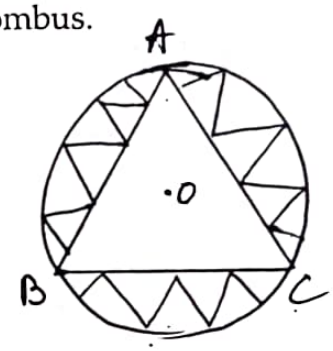
27. A bag contains 15 balls of which $x$ are blue the remaining are red. If the number of red balls are increased by 5, the probability of drawing the red balls doubles. Find

(a) P (red ball) (b) P (blue ball) (c) P (blue balls if 5 red balls actually added

28. A line intersect the $y-axis$ and $x-axis$ at the points $P$ and $Q$ respectively. If (2, -5) is the mid point of PQ, then find the coordinates of $P$ and $Q$.

29. Prove that the parallelogram circumscribing a circle is rhombus.

30. In a circular table cover of radius 32 cm, a design is formed leaving an equilateral triangle ABC in the middle as shown. Find the area of the design.



31. From a solid right circular cylinder with height 12 cm and radius of the base 5cm, a right circular cone of same height and same base radius is removed. Find the volume and total surface area of the remaining solid. ($\pi = 3.14$)

## Section - D

32. The ratio of the $11^{th}$ term to the $18^{th}$ term of an A.P. is 2 : 3. Find the ratio of the $5^{th}$ term to the $21^{st}$ term and also the ratio of the sum of the first five terms to the sum of the first 21 terms.

33. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2m /sec. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

OR

If AD and PM are the medians of $\Delta ABC$ and $\Delta PQR$ respectively, where $\Delta ABC \sim \Delta PQR$.

Prove that $\frac{AB}{PQ} = \frac{AD}{PM}$

34. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/h and time of flight increased by 30 min. Find the original duration of flight.

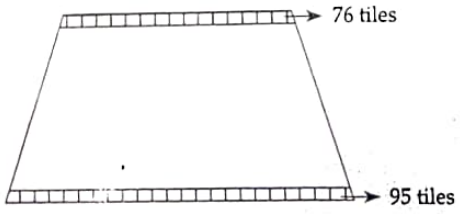
35. The mean of the following frequency distribution is 62.8 and sum of all frequencies is 50. Compute the missing frequencies $f_1$ and $f_2$.

| Classes | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 |
|---|---|---|---|---|---|---|
| Freq. | 5 | $f_1$ | 10 | $f_2$ | 7 | 8 |

## SECTION E

**36. Case-study 1**

A part of a roof with trapezoidal shape needs to be tiled with roof tiles. The bottom row needs 95 roof tiles and every higher row needs one roof tiles less than the row below it until there are 76 roof tiles needed for the top row.




Based on the above information, answer the following questions:

(*i*) What is the common difference of the AP?

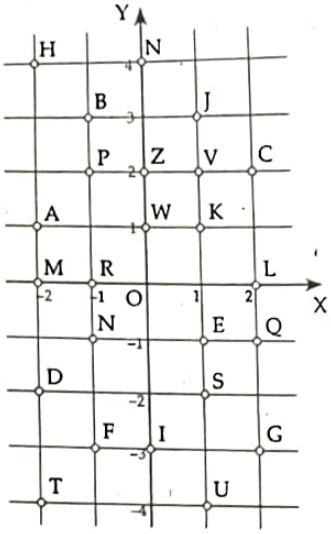
(*ii*) How many rows of tiles are there?

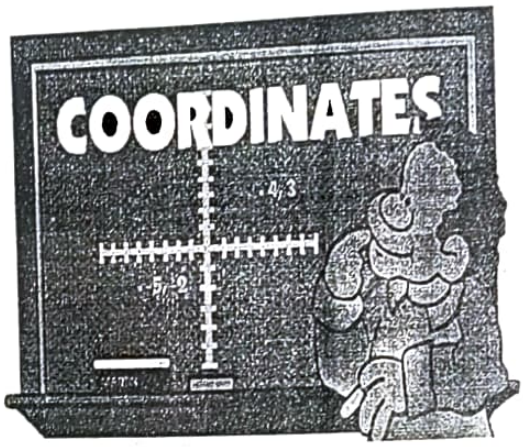
(*iii*) Find the total number of tiles in the middle two layers.

OR

(*iii*) Find the total number of tiles required to make the roof.

37. **Case-study 2**




Based on the above information, answer the following:

(*i*) What is the distance between P and Q?

(*ii*) Find the coordinates of the mid-point of the segment DJ.

(*iii*) What type of a triangle is ZML?

**OR**

(*iii*) In what ratio is KF divided by the *x*-axis?

38. **Case-study 3**

A carpenter is making decorative pieces from wood. He has two cubes of side 7 cm each. He decides to scoop out the largest hemisphere from one of the ends of one of the cubes and attach it at the top of the other one.

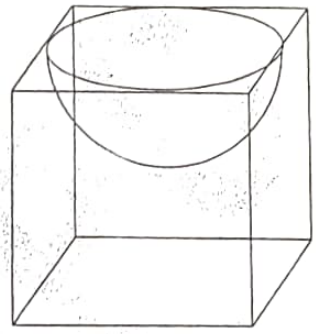


Figure 1

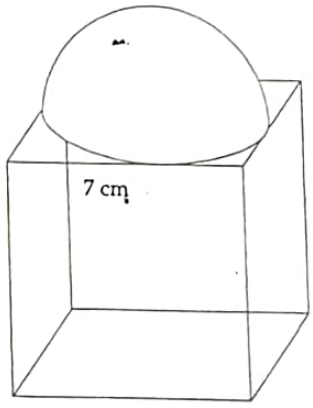



Figure 2

Based on the above information, answer the following questions:

(*i*) What is the depth of the hemisphere removed from the first cube?

(*ii*) What part of the surface area of the cube (in sq cm) is lost because of removing the hemisphere? (Refer figure 1)

(*iii*) What is the total surface area in sq cm of the above toy? (Refer figure 1)

**OR**

(*iii*) What is the total surface area in sq cm of the above toy? (Refer figure 2)

# BUDHA DAL PUBLIC SCHOOL PATIALA

**PRE BOARD EXAMINATION (8 January 2024)**

**Class – X**

**Paper-Mathematics Standard (Set-B)** **M.M. 80**

**Time: 3hrs.**

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## Section-A

1. If the ratio of areas of two circles is 25 : 16, then the ratio of their circumference is

   a) 16 : 25 b) 4 : 5 c) 5 : 4 d) 625 : 256

2. A girl walks 200 m towards East and then she walks 150 m towards North. The distance of the girl from the starting point is

   a) 350 m b) 250 m c) 300 m d) 225 m

3. If the class marks of a continuous frequency distribution are 22, 30, 38, 46, 54, 62 then the class corresponding to the class mark 46 is

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4. If two tangents inclined at an angle of $60^0$ are drawn to a circle of radius 3 cm then the length of each tangent is equal to

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5. Find the mode of the following distribution

| Age | 5 – 15 | 15 – 25 | 25 – 35 | 35 – 45 | 45 – 55 | 55 – 65 |
|---|---|---|---|---|---|---|
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6. The length of diagonals of rhombus are 16 cm and 12 cm. The length of the side of the rhombus is

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7. The value of $tan^2 30^0 - 4\ sin^2 45^0$ is

a) 1 b) $\frac{7}{3}$ c) $\frac{-5}{3}$ d) $\frac{-11}{3}$

8. The value of $k$ for which the equation $3x - y + 8 = 0$ *and* $6x - ky = -16$ represent coincident lines is

a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 2 d) $-2$

9. If HCF of 65 and 117 is expressible in the form 65 m $-$ 117, then m is

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12. The number $\left(\sqrt{3} + \sqrt{5}\right)^2$ is

a) not a real number b) a rational number

c) an irrational number d) an integer

13. In the adjoined figure the value of $cos\ \theta$

a) $\frac{12}{13}$

b) $\frac{13}{12}$

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14. If the system of equations $2x + 3y = 7$ *and* $2px + (p + q)y = 28$ has infinitely many solutions, then

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15. The product and the sum of the zeros of the polynomial $2x^2 - 2\sqrt{2}x + 1$ are respectively

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16. In $\Delta ABC, AD$ is internal bisector of $\angle A$. If BD = 5 cm and BC = 7.5 cm then AB : AC is

a) 2 : 1 b) 1 : 2 c) 2 : 3 d) 3 : 2

17. In the adjoining figure OACB is a quadrant of a circle of radius 7 cm. The perimeter of the quadrant is

a) 11 cm

b) 18 cm

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18. A bag contains 4 red, 3 green and 8 white balls. One ball is drawn at random. Find the probability of getting neither a red ball nor a white ball.

a) $\frac{4}{5}$ b) $\frac{1}{5}$ c) 1 d) none

**Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).**

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**b) Both A and R are true but Reason (R) is not the correct explanation of A**
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**d) A is false but R is true**

19. Statement A (Assertion) : If one zero of the polynomial $5x^2 - 11x - (k - 3)$ is the reciprocal of the other, then $k = -2$

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20. Statement A (Assertion) : If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

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**Section - B**

21. A square OABC is inscribed in a quadrant OPBQ.

If OA = 20 cm, find the area of the shaded

region ($\pi = 3.14$).

22. Three bulbs red, green and yellow flash at intervals of 80 seconds, 90 seconds and 110 seconds. All three flash together at 8 : 00 a.m. At what time will be three bulbs flash altogether again.

23. Solve for $x$ and $y$

$$mx - ny = m^2 + n^2$$
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**OR**

If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 - 5x - 3$, then find the values of p and q.

24. Find the value of $k$ so that the equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots.

25. The logs of iron table form two triangles as shown

a) Prove $\Delta AOB \sim \Delta DOC$

b) If AO = 30 cm and OD = 45 cm,

then, find the perimeter $(\Delta AOB)$: perimeter $(\Delta DOC)$

**Section - C**

26. From a solid right circular cylinder with height 12 cm and radius of the base 5cm, a right circular cone of same height and same base radius is removed. Find the volume and total surface area of the remaining solid. ($\pi = 3.14$)

27. A line intersect the $y - axis$ and $x - axis$ at the points $P$ and $Q$ respectively. If (2, -5) is the mid point of PQ, then find the coordinates of $P$ and $Q$.

28. Prove that $\frac{\sin\theta}{\sec\theta + \tan\theta - 1} + \frac{\cos\theta}{\operatorname{cosec}\theta + \cot\theta - 1} = 1$

**OR**

If $\tan\theta = \frac{1}{\sqrt{5}}$, find the value of $\frac{\operatorname{cosec}^2\theta - sec^2\theta}{\operatorname{cosec}^2\theta + sec^2\theta}$

29. Find the probability to having 53 Sundays in

a) a non-leap year b) a leap year

30. Prove that the parallelogram circumscribing a circle is rhombus.

31. In a circular table cover of radius 32 cm, a design is formed leaving an equilateral triangle ABC in the middle as shown. Find the area of the design.

## Section – D

32. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/h and time of flight increased by 30 min. Find the original duration of flight.

33. The mean of the following frequency distribution is 62.8 and sum of all frequencies is 50. Compute the missing frequencies $f_1$ and $f_2$.

| Classes | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 |
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35. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2m /sec. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

**OR**

In the adjoining figure $EB \perp AC, BG \perp AE$ *and* $CF \perp AE$.

Prove that

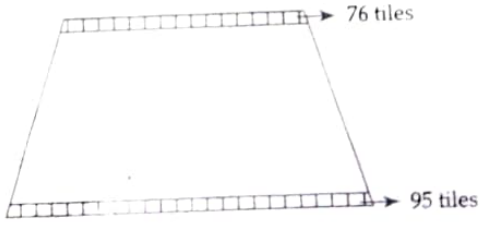
a) $\Delta ABG \sim \Delta DCB$

b) $\frac{BC}{BD} = \frac{BE}{AB}$

## Section – E

36. Case-study 1

A part of a roof with trapezoidal shape needs to be tiled with roof tiles. The bottom row needs 95 roof tiles and every higher row needs one roof tiles less than the row below it until there are 76 roof tiles needed for the top row.

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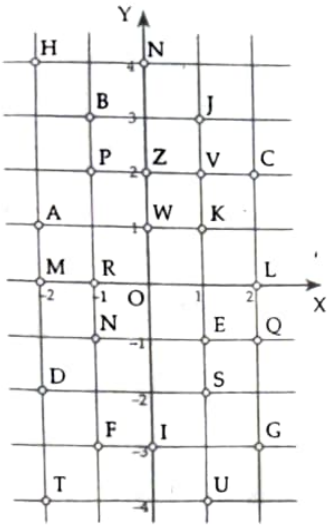
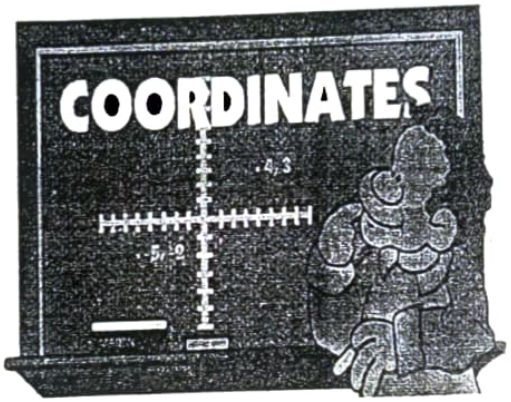
OR

(*iii*) Find the total number of tiles required to make the roof.

37. **Case-study 2**

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(*iii*) What type of a triangle is ZML?

**OR**

(*iii*) In what ratio is KF divided by the $x$-axis?

38. **Case-study 3**

A carpenter is making decorative pieces from wood. He has two cubes of side 7 cm each. He decides to scoop out the largest hemisphere from one of the ends of one of the cubes and attach it at the top of the other one.

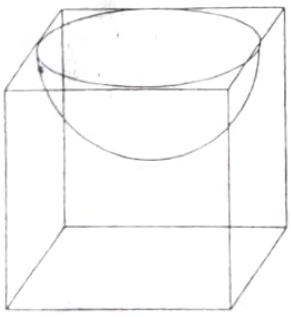

Figure 1

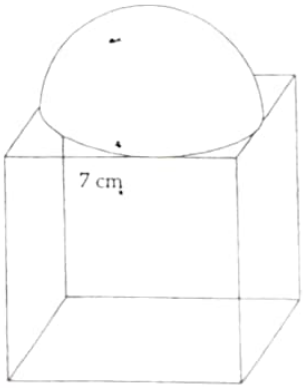


Figure 2

Based on the above information, answer the following questions:

(*i*) What is the depth of the hemisphere removed from the first cube?

(*ii*) What part of the surface area of the cube (in sq cm) is lost because of removing the hemisphere? (Refer figure 1)

(*iii*) What is the total surface area in sq cm of the above toy? (Refer figure 1)

**OR**

(*iii*) What is the total surface area in sq cm of the above toy? (Refer figure 2)

# BUDHA DAL PUBLIC SCHOOL PATIALA

**PRE BOARD EXAMINATION (8 January 2024)**

**Class – X**

**Paper-Mathematics Basic**

**Time: 3hrs.** **M.M. 80**

**General Instructions:**

1. This Question Paper has 5 Sections A, B, C, D and E.
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5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

## Section-A

1. Let a and b be two positive integers such t hat $a = p^3q^4$ *and* $b = p^2q^3$ where p and q are prime numbers. If HCF (a, b) = $p^mq^n$ and LCM (a, b) = $p^rq^s$ then $(m+n)(r+s) =$ _____

   a) 15 b) 30 c) 35 d) 72

2. The exponent of 2 in the prime factorization of 144 is

   a) 4 b) 5 c) 6 d) 3

3. The discriminant of $4x^2 + 3x - 2 = 0$ is

   a) $-23$ b) 41 c) 39 d) $-31$

4. The graph of the equations $2x + 3y - 2 = 0$ *and* $x - 2y - 8 = 0$ are two lines which are

   a) perpendicular to each other b) parallel

   c) coincident d) intersecting exactly at one point

5. The roots of a quadratic equation are 5 and -2 then, the equation is

   a) $x^2 - 3x + 10 = 0$ b) $x^2 - 3x - 10 = 0$ c) $x^2 + 3x + 10 = 0$ d) $x^2 + 3x - 10 = 0$

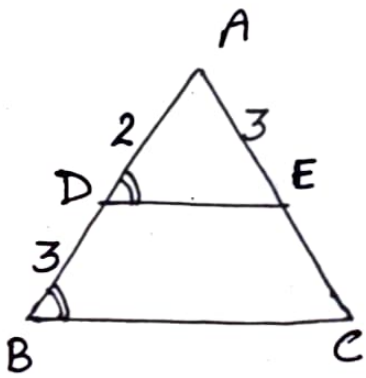
6. The distance between points (2, 3) and (4, 1) is

   a) $2\sqrt{2}$ b) $3\sqrt{2}$ c) 2 d) 3

7. In $\Delta ABC$ it is given that AB = 9 cm, BC = 6 cm and CA = 7.5cm. Also $\Delta DEF$ is given such that EF = 8cm and $\Delta DEF \sim \Delta ABC$. Then perimeter of $\Delta DEF$ is

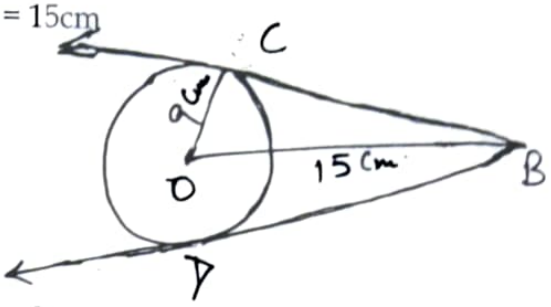
   a) 30 cm b) 22.5 cm c) 27 cm d) 25 cm

8. In the given figure of $\angle ADE = \angle ABC$ then CE is equal to



a) 4.5 b) 3 c) 2 d) 5

9. In given figure of OC = 9 cm and OB = 15cm then BC + BD is equal to




a) 24 cm b) 18 cm

c) 12 cm d) 36 cm

10. If $(\cos\theta + \sec\theta) = \frac{5}{2}$ then $(cos^2\theta + sec^2\theta) =$_____

a) $\frac{33}{4}$ b) $\frac{21}{4}$ c) $\frac{17}{4}$ d) $\frac{29}{4}$

11. If an angle of elevation of a tower from a distance 100 meters from its foot is $60^0$, then the height of the tower is

a) $\frac{200}{\sqrt{3}}m$ b) $50\sqrt{3}m$ c) $100\sqrt{3}m$ d) $\frac{100}{\sqrt{3}}m$

12. $(\sec\theta + \tan\theta)\ (\sec\theta - \tan\theta) =$

a) 1 b) $-1$ c) 0 d) none of these

13. The area of a sector of a circle with radius 6cm if the angle of the sector is $60^0$

a) $-\frac{152}{7}$ b) $\frac{132}{7}$ c) $\frac{142}{7}$ d) $\frac{122}{7}$

14. The chord of a circle of radius 10cm subtends a right angle at centre. The area of the minor segment ($\pi = 3.14$) is

a) 32.5 $cm^2$ b) 34.5 $cm^2$ c) 30.5 $cm^2$ d) 28.5 $cm^2$

15. Raju bought a fish from a shop for his aquarium. The shop keeper takes out one fish from a tank containing 15 male fish and 18 female fish. The probability that the fish taken out is a male fish is

a) $\frac{5}{11}$ b) $\frac{6}{11}$ c) $\frac{5}{12}$ d) $\frac{7}{11}$

16. The mean of the data when $\sum fidi = 435, \sum fi = 30$ and a = 47.5 is

a) 47.5 b) 62 c) 30 d) 63

17. A solid is hemispherical at the bottom and conical (of same radius) above it. If the surface areas of the two parts are equal then the ratio of its radius and the slant height of the conical part is

a) 4 : 1 b) 1 : 4 c) 1 : 2 d) 2 : 1

18. Consider the following frequency distribution

| Class | 0-5 | 6-11 | 12-17 | 18-23 | 24-29 |
|---|---|---|---|---|---|
| Frequency | 13 | 10 | 15 | 8 | 11 |

The upper list is medium class

a) 18.5 b) 17.5 c) 18 d) 17

**Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).**

a) **Both A and R are true and Reason (R) is correct explanation of A**

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

c) **A is true but R is false**

d) **A is false but R is true**

19. **Statement A (Assertion) :** Distance of (5, 12) from y-axis is 5 units.

**Statement R (Reason) :** Distance of point (h, k) from y-axis always k units.

20. **Statement A (Assertion) :** The H.C.F. of two numbers is 16 and their product is 3072. The their L.C.M. = 162.

**Statement R (Reason):** If a, b are two positive integers, then H.C.F. × L.C.M. = a × b.

## Section - B

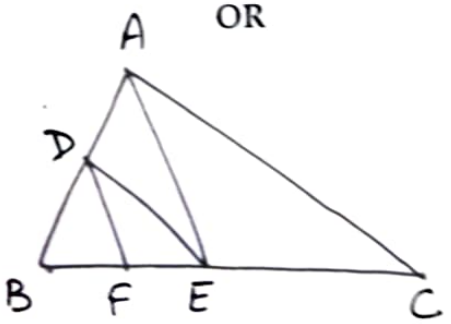
21. Is the pair of linear equation consistent/ inconsistent? If consistent, obtain the soluti graphically $2x - 2y - 2 = 0$; $4x - 4y - 5 = 0$

22. In a $\Delta ABC, AD$ is the bisector of $\angle A$, meeting the side BC and D. If AB = 5.6 cm, BC = 6 cm a BD = 3.2 cm find AC

OR

$DE \parallel AC$ and $DF \parallel AE$

Prove BF/FE= BE/EC




23. The length of a tangent from a point A at distance 5cm from the centre of the circle is 4 Find the radius of the circle.

24. Prove $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$

25. Find the area of quadrant of a circle who circumference is 22 cm.

**OR**

Find the area of sector of a circle with radius 6 cm if angle of sector is $60^0$.

**Section – C**

26. Prove that $\frac{1}{\sqrt{2}}$ is irrational.

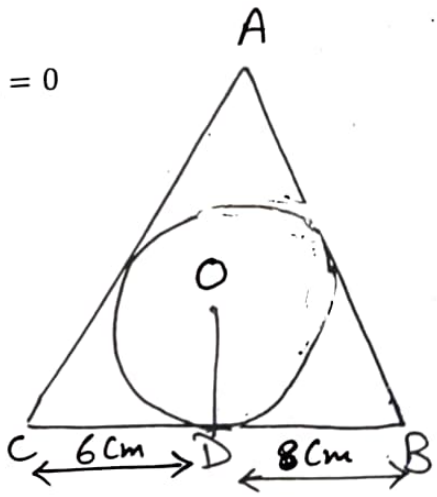
27. Write the quadratic polynomial having $-\frac{1}{4}$ and 1 as its zeros.

28. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of m for which $y = mx + 3$

**OR**

Solve graphically $2x - 3y + 13 = 0$ and $3x - 2y + 12 = 0$

29. A triangle ABC is drawn to circumciscribe a circle of radius 4cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively. Find the side AB and AC.




30. In $\Delta ABC$, right angled at B, if $\tan A = \frac{1}{\sqrt{3}}$, find the value of $\sin A \cos C + \cos A \sin C$

31. In a bag there are 44 identical cards with figure of circle or square on them. There are 24 circles of which 9 are blue and rest are green and 20 squares of which 11 are blue and rest are green. One card is drawn from the bag at random. Find the probability that it has the figure of

(i) Square (ii) green colour (iii) blue circle (iv) green square

**Section – D**

32. The sum of squares of two consecutive multiples of 7 is 637. Find the multiples.

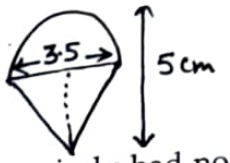
**OR**

Find the sum of first 22 terms of an AP in which d = 7 and $22^{nd}$ term is 149.

33. Find two numbers whose sum is 27 and product is 182.

34. A tent is in the shape of cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively and slant height of the top is 2.8 m. Find area of canvas used for making the tent. Also find the cost of the canvas of the tent at rate ofRs. 200 per $m^2$.

OR




Salman got applying top (lattu) as his birthday present, which surprisely had no colour on it. He wanted to colour it with his crayons. The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 mc. Find the area he has no colour.

35. The following data gives the distribution of total monthly household expenditure of 200 failies of a village. Find the modal monthly expenditure of the families. Also find the mean monthly expenditure.

| Expenditure | Frequency |
|---|---|
| 1000-1500 | 24 |
| 1500-2000 | 40 |
| 2000-2500 | 33 |
| 2500-3000 | 28 |
| 3000-3500 | 30 |
| 3500-4000 | 22 |
| 4000-4500 | 16 |
| 4500-5000 | 7 |

## Section – E

**Case Study Based Questions:**

**36. Read the text carefully and answer the questions:**

Saving money is a good habit and it should be inculcated in children from the beginning. Mrs. Pushpa brought a piggy bank for her child Akshar. He puts one five-rupee coin of his savings in the piggy bank of the first day. He increases his savings by one five-rupee coin daily.

a) If the piggy bank can hold 190 coins of five rupees in all, find the number of days he can contribute to put the five-rupee coins into it.

b) Find the total money he saved.

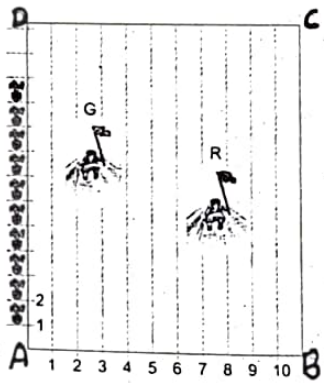
**OR**

How many coins are there in piggy bank on 15th day?

c) How much money Akshar saves in 10 days?

**37. Read the text carefully and answer the questions:**

In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground *ABCD*, 100 flowerpots have been placed at a distance of 1 m from each other along *AD*, as shown in given figure below. Niharika runs 1/4 th the distance *AD* on the 2nd line and posts a green flag. Preet runs 1/5th distance *AD* on the eighth line and posts a red flag.




**Based on the above information, answer the following questions.**

(*i*) Write the position of red flag.

(*ii*) What is the distance between both the flags?

(*iii*) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

**OR**

If Joy has to post a flag at one-fourth distance from green flag in the line segment joining the green and red flags, then where should he post his flag?

36. **Sattelite Towers in Himalayas**

The sattellite image of Himalaya Mountain is shown below. In this image there are many signal towers are standing. The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of elevation of the top of the tower with height 50 m from the foot of the hill is 30°.

On the basis of above information, answer the following questions.

(i) Find the horizontal distance between hill and tower. (2)

*Or*

Find the height of the hill, if the distance between bottom of hill and tower is $50\sqrt{3}$ m. (2)

(ii) Find the distance from foot of tower to the top of the hill. (1)

(iii) Find the distance from foot of the hill to the top of the tower. (1)