ASSIGNMENTS

Module – 1
Rational Numbers

Q.1. Insert six rational numbers between $\frac{2}{3}$ and $\frac{5}{9}$. (Any)

Q.2. Represent the following on the number line –

(i) $\frac{3}{8}$ *(ii)* $\frac{-1}{2}$

Q.3. Find:–

(i) $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times \left(\frac{-14}{9}\right)$

(ii)

$$\left(\frac{-7}{8} \times \frac{15}{-7}\right) - \left(1 \times \frac{1}{4}\right) + \left(\frac{1}{2} + \frac{1}{4}\right) =$$

Q.4 Verify the following by taking

$x = \frac{2}{3}, y = \frac{-5}{6}, z = \frac{5}{9}$

(i) $x \times (y + z) = x \times y + x \times z$
(ii) $x + (y + z) = (x + y) + z$

Q.5. Name the property used in the following given a, b, c are rational numbers.

(i) $a \times (b \times c) = (a \times b) \times c$ _____
(ii) $0 \times a = a \times 0 = 0$ _____
(iii) $a \times (b + c) = (a \times b) + (a \times c)$ _____
(iv) $a + b = b + a$ _____
(v) $b + 0 = 0 + b = b$ _____
(vi) a + b is a rational number _____

Q.6. *(i)* The reciprocal of a negative rational number is _____.

(ii) $\frac{6}{-50}$ in the standard form can be written as _____.

(iii) Which is greater? $\left[\frac{5}{16}, \frac{3}{-4}\right]$ _____.

(iv) If *x* and y are any 2 rational number then _____ is a rational number between *x* and y.

Q.7. What should be subtracted from $\left(\frac{3}{4}-\frac{2}{3}\right)$ to get $-\frac{1}{6}$?

(MCQ)Rational Numbers

1. The additive identity for rational numbers is
   (i) 1 *(iii)* –1
   (ii) 0 *(iv)* None of these

2. Rational number between two rational numbers can be found with the help of
   (i) Mean *(iii)* Mode
   (ii) Median *(iv)* None of these

3. The product of $-\frac{1}{3}$ and $-\frac{1}{4}$ is
   (i) –12 *(iii)* 12
   (ii) $-\frac{1}{12}$ *(iv)* $\frac{1}{12}$

4. A rational number between $-\frac{1}{2}$ and $\frac{1}{2}$ is
   (i) $-\frac{3}{4}$ *(iii)* $\frac{3}{4}$
   (ii) 1 *(iv)* None of these

5. The reciprocal of $-\frac{6}{7}$ is
   (i) $\frac{6}{7}$ *(iii)* $-\frac{7}{6}$
   (ii) $\frac{-6}{-7}$ *(iv)* $\frac{7}{6}$

6. (a+b)+c= a+(b+c) is _____ property
   (i) Closure *(iii)* Associative
   (ii) Additive *(iv)* None of these

7. $0 \times (-8) = ?$

(i) –8 *(iii)* 8
(ii) 1 *(iv)* 0

8. _____ does not have a reciprocal

(i) 1 *(iii)* 0
(ii) 2 *(iv)* –1

9. $\frac{4}{5} \times \frac{1}{2} + \frac{4}{5} \times \frac{1}{2}$

(i) $\frac{4}{10}$ *(iii)* $\frac{4}{5}$
(ii) $\frac{4}{2}$ *(iv)* $\frac{4}{40}$

10. The additive inverse of $\frac{8}{-17}$ will be

(i) $\frac{8}{17}$ *(iii)* $\frac{17}{8}$
(ii) $\frac{-8}{17}$ *(iv)* $\frac{-17}{8}$

11. The number _____ and _____ are their own reciprocals.

(i) –1 and 1 *(iii)* 0 and 0
(ii) 0 and 1 *(iv)* 1 and 0

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Module – 2
Squares And Square Roots

Q.1. State whether the following are true or false:-

(i) Numbers ending with 2, 3, 7 or 8 are never perfect square. { }

(ii) $\sqrt{0.4} = 0.2$ { }

(iii) The square of a prime number is prime. { }

(iv) The difference of two perfect squares is a perfect square. { }

(v) $75^2 - 74^2 = 149$ { }

Q.2. Given that $\sqrt{1530169} = 1237$, find the value of

(a) $\sqrt{1.530169} + \sqrt{153.0169}$

(b) $\sqrt{15301.69} \div \sqrt{1.530169}$

Q.3. What number when multiplied by itself will become 83.7225?

Q.4. An army General wishing to arrange his men, who were 335250 in number in the form of a square found that there were 9 men left over. How many were there in each row?

Q.5. Find the least square number which is exactly divisible by each of the number 6,9,15 and 20.

Q.6. How many natural numbers lie between squares of 99 and 100.

(MCQ) Square and Square Roots

1. The square of 18 is

(i) 9 *(iii)* 324

(ii) 144 *(iv)* 36

2. What least number must be subtracted from 14 to make it a perfect square

(i) 2 *(iii)* 4

(ii) 7 *(iv)* 5

3. The square root of $\frac{81}{361}$ is

(i) $\frac{9}{27}$ *(iii)* $\frac{40}{101}$

(ii) $\frac{12}{17}$ *(iv)* $\frac{9}{19}$

4. In a right-angled triangle, the longest side is always the _____

(i) Base *(iii)* Hypotenuse

(ii) Perpendicular *(iv)* None

5. The square root of 1.44 is

(i) $\frac{12}{10}$ *(iii)* $\frac{12}{100}$

(ii) $\frac{10}{13}$ *(iv)* $\frac{72}{10}$

6. Negative numbers have _____ square root in the system of rational number.

(i) no *(iii)* always (+ve)

(ii) yes *(iv)* always (–ve)

7. The area of a square field is $2500m^2$. Its side is

(i) 25 m *(iii)* 250 m

(ii) 500 m *(iv)* 50 m

8. The value of $53^2 - 52^2$ is

(i) 100 *(iii)* 105

(ii) 1^2 *(iv)* 51^2

9. By what number we should divide 800 to make it a perfect square

(i) 80 *(iii)* 2

(ii) 5 *(iv)* 4

10. Which of the following is a Pythagorean triplet?

(i) 16, 18, 20 *(iii)* 30, 40, 50

(ii) 1, 2, 3 *(iv)* 50, 51, 52

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Module – 3
Cubes And Cube Roots

Q.1. Evaluate:

(i) $\sqrt[3]{27} + \sqrt[3]{0.008} + \sqrt[3]{0.064}$

(ii) $\sqrt[3]{0.1 \times 0.1 \times 0.1 \times 13 \times 13 \times 13}$

(iii) $\sqrt[3]{8 \times 17 \times 17 \times 17}$

Q.2. Find the side of cube when volume of cube is 3375 cm^3.

Q.3. The surface area of a cube is 216m^2. Find the volume of the cube.

Q4 By what smallest number should 9000 be divided so that the quotient is a perfect cube. Find the cube root of the quotient.

Q.5. What is the smallest number by which 5400 may be multiplied so that the product is a perfect cube and find the cube root of the product.

Q.6. Three numbers are in the ratio 1:2:3. The sum of their cubes is 98784. Find numbers.

Cube and Cube Roots

1. The cube of 11 is
   (i) 121 *(iii)* 1331
   (ii) 256 *(iv)* 729

2. If a and b are positive integers such that $a^2 > b^2$, then a^3 ____ b^3
   (i) > *(iii)* =
   (ii) < *(iv)* None of these

3. The cube of $-\frac{1}{3}$ will be
   (i) $-\frac{1}{9}$ *(iii)* $\frac{-1}{27}$
   (ii) $\frac{1}{27}$ *(iv)* $\frac{-1}{-27}$

4. By what number should we divide 40 to make it a perfect cube?
   (i) 5 *(iii)* 10
   (ii) 4 *(iv)* 20

5. The edge of a cube is 0.9 cm, so its volume is

(i) $8.1\ cm^2$ *(iii)* $7.29cm^3$

(ii) $0.729cm^3$ *(iv)* $72.9cm^3$

6. The cube root of 10,00,000 is

(i) 1000 *(iii)* 10

(ii) 10,000 *(iv)* 100

7. The number whose cube is equal to –17576 is

(i) –26 *(iii)* 26

(ii) –36 *(iv)* –16

8. If the digit in the one's place of a number is 8, the digit in the one's place of its cube will be

(i) 2 *(iii)* 4

(ii) 8 *(iv)* 6

9. Cube root of 1.331 is

(i) 11 *(iii)* 1.1

(ii) 0.11 *(iv)* 0.011

10. The cube root of $\sqrt[3]{\frac{-2197}{9261}}$ is

(i) $-\frac{13}{21}$ *(iii)* $\frac{17}{19}$

(ii) $\frac{13}{21}$ *(iv)* $\frac{9}{11}$

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Module – 4 & 5
Understanding Quadrilaterals

Q.1. State true or false:

(i) Every trapezium is a square _____.
(ii) All squares are rectangles _____.
(iii) Sum of all the angles of a trapezium is 360^0_____.
(iv) All squares are rhombuses _____.
(v) All parallelograms are rectangles _____.
(vi) Sum of exterior angles of a rhombus is 360^0_____.
(vii) All rectangles are squares _____.
(viii) All rectangles are parallelograms _____.
(ix) All rhombuses are parallelograms _____.
(x) At least one pair of opposite sides of a trapezium are parallel _____.
(xi) Every square is a trapezium _____.
(xii) Every parallelogram is a rhombus _____.
(xiii) An n- sided convex polygon has _____ diagonals.
(xiv) The sum of the interior angles of pentagon is _____.
(xv) The sum of all interior angles of a polygon of 'n' sides is _____.

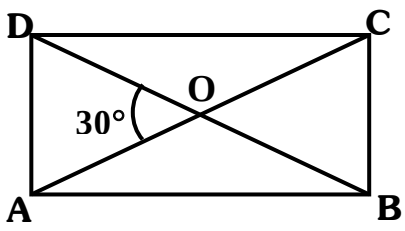
Q.2. In a quadrilateral PQRS; $\angle P = 80^0$, $\angle Q = 90^0$, $\angle R = 65^0$. Find the measure of $\angle S$. What kind of quadrilateral is it? Convex or concave.

Q.3. Two angles of a quadrilateral is 90^0 each. The third and the fourth angles are in the ratio 2:3. Find the measure of the third and fourth angle.

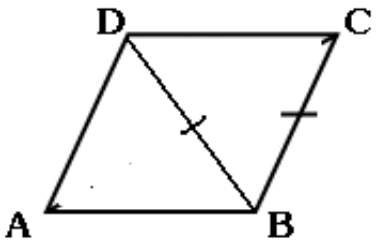
Q.4. ABCD is a parallelogram in which the adjacent angles are $(4x - 15)^0$ and $(5x - 3)^0$. Find the measure of all the angles of the parallelogram.

Q.5. ABCD is a parallelogram in which $\angle BAD = 60^0$ and $\angle CBD = 70^0$. Find the measure of $\angle ABC$, $\angle ADC$, $\angle BDC$ and $\angle ADB$. Draw the figure also.

Q.6. The diagonals of rectangle ABCD intersect each other at O. If $\angle AOD = 30^0$, find $\angle COD$ and $\angle$ OCD.

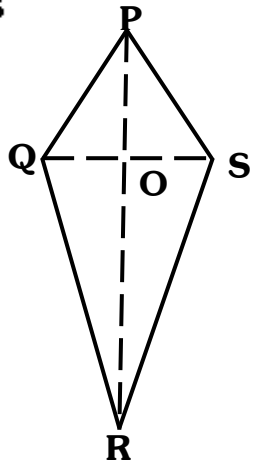


Q.7. Diagonal BD of rhombus ABCD is equal to one of its sides BC. Find the angles of the rhombus.



Q.8. PQRS is a kite, then with reasons complete the blanks.

PQ = _____; _____
RS = _____; _____
∠Q = _____; _____
∠POS = ∠POQ = ∠QOR = ∠SOR = _____; _____



(MCQ) Understanding Quadrilaterals

1. A quadrilateral with only one pair of opposite sides parallel is a
   (i) parallelogram *(iii)* rhombus
   (ii) trapezium *(iv)* square

2. A quadrilateral with all sides angles and diagonals equal is a
   (i) square *(iii)* rhombus
   (ii) rectangle *(iv)* trapezium

3. The 3 angles of a quadrilateral are 110°, 120° and 40°. The fourth angle is
   (i) 120° *(iii)* 100°
   (ii) 110° *(iv)* 90°

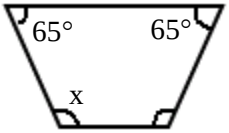
4. The sum of the exterior angles of a hexagon is
   (i) 180° *(iii)* 220°
   (ii) 360° *(iv)* 400°

5. Each exterior angle of a rectangle is
   (i) 45° *(iii)* 120°
   (ii) 90° *(iv)* None of these

6. A quadrilateral has 3 acute angles, each measuring 80°. So the fourth angle will be
   (i) 120° *(iii)* 100°
   (ii) 150° *(iv)* 80°

7. The angles of a quadrilateral in the ratio 1:2:3:4. So the smallest angle is
   (i) 40° *(iii)* 36°
   (ii) 18° *(iv)* 27°

8. In the diagram shown the value of x is
   (i) 65° *(iii)* 120°
   (ii) 115° *(iv)* 135°



9. The sum of two opposite angles of a parallelogram is 150°, so the measure of each of the other two angles is
   (i) 55° *(iii)* 105°
   (ii) 80° *(iv)* None of these

10. Each exterior angle of a regular polygon is 30°, so the polygon has
    (i) 10 sides *(iii)* 12 sides
    (ii) 8 sides *(iv)* 6 sides

11. Find the number of sides of a regular polygon whose each exterior angle has measure 24°.
    (i) 15 *(iii)* 8
    (ii) 24 *(iv)* 7

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MODULE – 6
Algebraic Expressions And Identities

Q.1. Which of the following algebraic expressions are polynomial and why?

(i) $\dfrac{x^2 + 7x + 3}{x}$ *(ii)* $\dfrac{1}{7} - 13x^2 + \dfrac{8}{3}x^4 - \dfrac{1}{13}x^3$

Q.2. Fill in the blanks:

(i) $\dfrac{2}{3}ab^2$ is a _____.

(ii) $6a^3b^3c$, $-3cb^3a^2$ are _____ terms.

(iii) Product of $\dfrac{2}{3}x^2y$ and $\dfrac{12}{17}y$ is _____.

(iv) $7x^2y \times \dfrac{-2}{7}xz^2 \times \dfrac{-2}{5}y^2z \times 5x^3y^2z^2$ = _____.

(v) Degree of the polynomial in Q1 (ii) is _____.

Q.3. Find the value of $(5a^6)$ $(-10\ ab^2)$ $(-2.1\ a^2b^3)$ for a = $\dfrac{2}{5}$, b = $\dfrac{1}{2}$.

Q.4. Simplify : - $n^2(n-2) + 2n^3(n+3) - 6n(n-4)$.

Q.5. Simplify the following :–

(i) 67×73 *(ii)* 113×87

(iii) $(79)^2 - (69)^2$ *(iv)* $\dfrac{198 \times 198 - 102 \times 102}{96}$

Q.6. What must be subtracted from
$3a^2 - 6ab - 3b^2 - 1$ to get $4a^2 - 7ab - 4b^2 + 1$

Q.7. Show that $(9a - 5b)^2 + 180ab = (9a + 5b)^2$.

Q.8. If $\left(x - \dfrac{1}{x}\right) = 9$**, find** $x^2 + \dfrac{1}{x^2}$

Q.9. Find the value of $\left(x - \dfrac{1}{x}\right)\left(x + \dfrac{1}{x}\right)\left(x^2 + \dfrac{1}{x^2}\right)\left(x^4 + \dfrac{1}{x^4}\right)$

(MCQ) Algebraic Expressions and Identities

1. On simplifying $4x^2 - 3y^2 + 2z^2 - 5x^2 + 2y^2 - 2z^2$, we get
   (i) $-x^2 - y^2$ *(iii)* $y^2 - z^2$
   (ii) $x^2 - y^2 + z^2$ *(iv)* $x^2 + y^2$

2. If a=7, the value of $a^2 - 3a$ is
   (i) 16 *(iii)* 32
   (ii) 28 *(iv)* 50

3. If we multiply $\left(2x^2 - y\right)$ by xy, we get
   (i) $2x^2y^2$ *(iii)* $2x^3y - y^2x$
   (ii) $2x^2 - y^2$ *(iv)* $2x^3y^2$

4. On simplifying $\left(2x^3 - 4x^2 - 6x + 8\right) \div 2x$, we get
   (i) $x^2 - 2x - 3 + \frac{4}{x}$ *(iii)* $x^2 - x + 2$
   (ii) $x^2 - 3x + 4$ *(iv)* $x^3 - x^2$

5. $a^2 - 2ab + b^2$ is the same as
   (i) $\left(a + b\right)^2$ *(iii)* $a^2 - b^2$
   (ii) $\left(a - b\right)^2$ *(iv)* None of these

6. If y=–2, the value of $4y^2 + 2y + 1$ is
   (i) 16 *(iii)* 12
   (ii) –4 *(iv)* 13

7. The product of (m+2) (m–2) is
   (i) $2m - m^2$ *(iii)* $m^2 + m$
   (ii) $m^2 - 4$ *(iv)* None of these

8. $\left(6x^2 - 4x + 5\right) - \left(3x^2 - 2x - 3\right)$ is equal to
   (i) $x^2 - 6x + 2$ *(iii)* $4x^2 + 6x - 8$
   (ii) $3x^2 - 2x + 8$ *(iv)* $x^2 + x - 2$

9. Which expression is a factor of $m^2 + 2mn + n^2$
   (i) $m - n$ *(iii)* $m^2 - n^2$
   (ii) $m^2 + n$ *(iv)* $m + n$

10. If ab=6 and a+b= 5, then the value of $\left(a^2+b^2\right)$

(i) 11 *(iii)* 13

(ii) 12 *(iv)* 16

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Q.2. Word Problems:

(i) Find the number which when added to the numerator and denominator of the fraction $\frac{5}{2}$ makes it equal to $\frac{4}{3}$.

(ii) A boy covers a distance of 20 km in 2 $\frac{1}{2}$ hrs; partly on feet at the rate of 5km/hr and partly on bicycle at the rate of 10km/hr. Find the distance covered on foot.

(iii) For what kind of triangle will the angles be $4x^0$, $(5x - 15)^0$ and $(2x + 30)^0$?

(iv) Today, Mr. Nelson is 4 times as old as his son. Four years hence, Mr. Nelson would be three times as old as his son then. Find the present age of Mr. Nelson.

(v) The sum of the digits of a 2-digit number is 12. If the number formed by reversing its digits is greater than the original number by 18. Find the original number.

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Linear Equations in one variable

1. Linear equations have the power of the variable as
   (i) 0
   (ii) 1
   (iii) 1 to 5
   (iv) 2 to 4

2. If $4a = \frac{1}{2}$, value of *a* is
   (i) 0
   (ii) 1
   (iii) 8
   (iv) $\frac{1}{8}$

3. If $-y = -7 + 1$, value of y is
   (i) 7
   (ii) –6
   (iii) 8
   (iv) 6

4. If $\frac{b}{3} + \frac{b}{5} = 8$, value of b is
   (i) 16
   (ii) 64
   (iii) 15
   (iv) –8

5. If 5 times a number increased by 4 is 39, the number is
   (i) 9 *(iii)* 11
   (ii) 7 *(iv)* 5

6. The solution of 4m – 4=2m+6 is
   (i) m=4 *(iii)* m=6
   (ii) m=5 *(iv)* m=7

7. If 5(a–3) – 4(a–2)=0, then value of a is
   (i) 7 *(iii)* 4
   (ii) 5 *(iv)* –3

8. If $\frac{5n}{6}+\frac{3n}{4}=\frac{19}{12}$, the value of n is
   (i) 4 *(iii)* 2
   (ii) 3 *(iv)* 1

9. If $P-\frac{P}{2}=\frac{9}{2}$ then the value of P is
   (i) 9 *(iii)* 8
   (ii) 7 *(iv)* 6

10. The sum of three consecutive even numbers is 42. The numbers are
    (i) 10,12,14 *(ii)* 12,14,16
    (iii) 14,16,18 *(iv)* 16,18,22

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Module – 8
Data Handling

Q.1. Present the following data in the form of a grouped frequency distribution having 6 classes of equal size one class being 16 – 24.

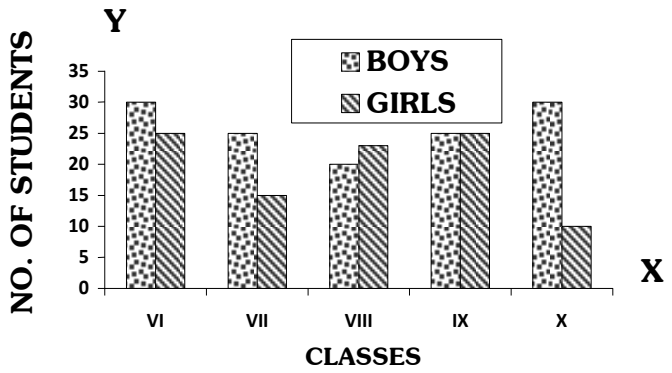
42, 18, 49, 43, 41, 53, 52, 49, 37, 36, 23, 33, 28, 53, 19, 36, 17, 56, 58, 34, 39, 25, 30, 60, 55, 39, 59, 61, 34, 58, 50, 35, 47, 55, 37, 53, 61, 39 , 18, 28

Q.2. Draw a bar graph for the following data.

The main source of energy used by each house in a street is listed below

Source of energy	Electricity	Solar	Gas	Oil
No. of houses	20	10	12	6

Q.3. The bar graph given represents the class-wise enrolment of a secondary school. Read the graph and answer the following question.



(i) Which class has the maximum number of students and how many?
(ii) In which class the no. of boys equals the number of girls?
(iii) Find the ratio of the number of boys to girls in class VIII.
(iv) What is the difference between the no. of boys and girls in classX.
(v) What is the enrolment of class VII?

Data Handling

1. The number of times an observation occurs in a data is called its
   (i) Range *(iii)* Raw data
   (ii) Frequency *(iv)* Interval

2. In the class- interval 70-80, 80 is the
   (i) Lower limit *(iii)* Range
   (ii) Frequency *(iv)* Upper limit

3. The class mark of 95- 100 is
   (i) 95 *(iii)* 97.5
   (ii) 95.5 *(iv)* None of these

4. The difference between the upper and lower limit is called
   (i) Class mark *(iii)* Group
   (ii) Class interval *(iv)* Class size

5. The shape of a pie-chart is
   (i) Square *(iii)* Oval
   (ii) Rectangular *(iv)* Circular

6. The pie- chart is divided into
   (i) Segments *(iii)* Sectors
   (ii) Circles *(iv)* Squares

7. The central total angle in a pie chart is
   (i) 180° *(iii)* 200°
   (ii) 280° *(iv)* 360°

8. 18 out of 36 people love reading, so reading in the pie chart will be represented by
   (i) Quarter circle *(iii)* 18° sector
   (ii) Semi circular sector *(iv)* None of these

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Module – 9
Introduction To Graphs

Q.1. Plot the following points and verify if they lie on a line. If they lie on a line name it.

(i) (0, 5), (0, 9), (0, 0), (0, 1) *(ii)* K (1, 2), L (1, 3), M (2, 2), N (5, 4)

Q.2. Draw graph for the following:

(i)

Time (in hours)	1	2	3	4
Distance covered (in km)	30	60	90	120

(ii)

Deposit (in Rs.)	100	200	300	500	1000
Annual S.I (in Rs.)	10	20	30	50	100

Q.3. Fill in the blanks:

(i) A _____ graph is used to show comparison among categories.
(ii) A _____ is a bar graph that shows data in intervals.

(iii) A _____ graph is used to compare parts of a whole.

(iv) The graph which is a whole unbroken line is called a _____.

(v) For fixing a point on the graph sheet we need _____ coordinate and _____ coordinate.

Q.4. A bank charges 10% p.a. simple interest on the principal borrowed. Draw a principal – S.I. graph to illustrate the relation.

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(MCQ) Introduction to Graph

1. The coordinates of the origin are
   (i) (0,1) *(iii)* (0,0)
   (ii) (1,1) *(iv)* (1,0)

2. The point P(0,3) lies on the
   (i) x-axis *(iii)* origin
   (ii) y-axis *(iv)* None of these

3. How many axes does the Cartesian system has?
   (i) Two *(iii)* Three
   (ii) four *(iv)* Five

4. The point Q(5,0) lies on the
   (i) x-axis *(iii)* origin
   (ii) y-axis *(iv)* None of these

5. Point P(2,9), Q(2,12) and R(2,15) lie on a line. Which of the following points lies on the same line?
   (i) M(5,2) *(iii)* O(14,2)
   (ii) N(2,10) *(iv)* S(3,9)

6. Points A(4,6), B(9,6) and C(12,6) lie on a line. Which of the following points lies on the same line?
   (i) D(15,6) *(iii)* F(6,4)
   (ii) E(12,10) *(iv)* G(6,13)

7. Which of the following points lies on the x-axis
   (i) A(0,8) *(iii)* C(5,5)
   (ii) B(2,3) *(iv)* D(5,0)

8. Which of the following points lies on the y-axis
   (i) E(7,0) *(iii)* G(0,9)
   (ii) F(3,2) *(iv)* H(7,9)

9. Which statement is false?
   (i) A line graph displays data that changes over time.
   (ii) The independent variable is generally shown along x-axis.
   (iii) The two axis in a line graph must have the same scale.
   (iv) The graph of a linear equation is a straight line.

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MODULE – 10

Revision For Summative Assessment-I

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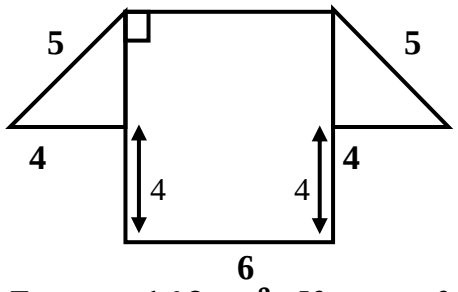
Module – 11
Mensuration

Q.1. The area of a square ABCD is 16 cm^2 . Find the area of the square joining the mid- points of the sides

Q.2. The parallel sides of trapezium are 20 cm and 10 cm. Its non- parallel sides are both equal, each being 13 cm, find the area of trapezium.

Q.3. Find the area of shape.

Measurement given in cm.



Q.4. The area of a trapezium of height 7cm is 140cm^2. If one of the parallel sides is 25cm, find the other side.

Q.5. The curved surface area of a right circular cylinder of height 14cm is 88cm^2. Find the radius of the base of the cylinder.

Q.6. A hall is 15m long, 10m wide and 5m high. Its walls and the roof are to be white washed from inside. Find the

⇒ Total area to be white washed

⇒ Cost of white washing from inside at rate of Rs. 8 per m^2.

Q.7. A soap cake is 5.5cm × 3.5cm × 3cm. What will be the volume of a box containing 150 soap cakes?

Q.8. A room is 10m long, 8m wide and 3.3m high. How many persons can sit in it if each person requires 3 cubic metre (3m^3) space?

Q.9. A cylindrical vessel opens at the top has a base radius 10.5 cm and height 14 cm. Find the cost of painting the inner part of the vessel at the rate of Rs. 10 per 100 cm^2.

Q.10.At a navratri mela a stall keeper in one of the food stalls has a large cylindrical vessel of base radius 15 cm filled up to a height of 32 cm with orange juice. The juice is filled in small cylindrical glasses of radius 3 cm upto a height of 8 cm. How many glasses of juice did he sell?

Q.11. A rectangular field is 154m long and 121m broad. A well of 14m length and 11m breadth is dug inside the field and mud take out is spread evenly over the remaining part of the field to a thickness of 25cm. Find the depth of the well.

(MCQ) Mensuration

1. Area of a parallelogram is 48 cm^2. If its base is 8 cm then its height will be
   (i) 6 cm *(iii)* 60 cm
   (ii) 7 cm *(iv)* 8.5 cm

2. The base of a triangle is 10 cm and its height is 7 cm, so its area will be
   (i) 70 cm^2 *(iii)* 35 cm^2
   (ii) 3 cm^2 *(iv)* 17 cm^2

3. The diameter of a circle is 14 cm, so its circumference will be
   (i) 88 cm *(iii)* 140 cm
   (ii) 44 cm *(iv)* None of these

4. The radius of a circle is 10 cm. Find its area if π=3.14
   (i) 3.14 cm^2 *(iii)* 314 cm^2
   (ii) 31.4 cm^2 *(iv)* 13.14 cm^2

5. The parallel sides of a trapezium are 6 cm and 8 cm and its area is 70 cm^2, so its height is
   (i) 10 cm *(iii)* 14 cm
   (ii) 5 cm *(iv)* 8 cm

6. The area of a square is 25 cm^2, so its perimeter is
   (i) 10 cm *(iii)* 50 cm
   (ii) 5 cm *(iv)* 20 cm

7. The diagonals of a rhombus are 10 cm and 8 cm, so its area will be
   (i) 40 cm^2 *(iii)* 18 cm^2
   (ii) 80 cm^2 *(iv)* 36 cm^2

8. If we double the length of a square , its area will increase to
   (i) double *(iii)* 3 times
   (ii) 4 times *(iv)* None of these

9. The circumferences of two concentric circles are 176 cm and 132 cm respectively, the difference of their radii is
   (i) 5 cm *(iii)* 8 cm
   (ii) 7 cm *(iv)* 44 m

10. The surface area of a cube with side 4 cm is
   (i) 106 cm^2 *(iii)* 64 cm^2
   (ii) 96 cm^2 *(iv)* 70 cm^2

11. The volume of a cuboid of length 8 cm, breadth 4 cm and height 3 cm is
   (i) 12 cm^3 *(iii)* 80 cm^3
   (ii) 96 cm^3 *(iv)* None of these

12. 5 kilolitres is the same as
   (i) 500 litres *(iii)* 5000 litres
   (ii) 50 litres *(iv)* 50 m^3

13. The perimeter of a room is 44 m and its height is 6 m. So the area of the 4 walls is
   (i) 100 cm^2 *(iii)* 264 cm^2
   (ii) 50 cm^2 *(iv)* 144 cm^2

14. The volume of a cylinder with 40 cm^2 base and height 9 cm is
   (i) 49 cm^3 *(iii)* 360 cm^3
   (ii) 409 cm^3 *(iv)* 324 cm^3

15. A cylinder is 25 cm tall and has a circular base with 10 cm radius. Find its total surface area (use $\pi=3.14$)
   (i) 2198 cm^3 *(iii)* 668 cm^3
   (ii) 6250 cm^3 *(iv)* None of these

16. How many 1 cm cubes can be fitted into a cuboidal box with sides 10 cm, 8 cm and 6 cm
   (i) 58 cubes *(iii)* 80 cubes
   (ii) 480 cubes *(iv)* 86 cubes

17. Find the cost of painting a 1 m cube on all sides at the rate of Rs. 50 per m^2
   (i) Rs 56 *(iii)* Rs 250
   (ii) Rs 100 *(iv)* Rs 300

18. Find the lateral surface area of a cylinder with circular base of radius 7 cm and height 10 cm

(i) 440 cm^2 *(iii)* 140 cm^2

(ii) 70 cm^2 *(iv)* None of these

19. Find the surface area of a cuboid with sides 4 cm, 3 cm and 1 cm

(i) 12 cm^2 *(iii)* 40 cm^2

(ii) 38 cm^2 *(iv)* 48 cm^2

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Module – 12

Direct And Inverse Variations

Q.1. A machine can produce 180 tools in 6 hrs. How many will it produce in 9 hrs?

Q.2. If 56 men can do a piece of work in 42 days. How many men will complete the same work in 14 days.

Q.3. A man deposited a sum of Rs. 5000 in a bank and earned an interest of Rs. 600 in 2 years. How much would a deposit of Rs. 8000 earn in the same period? (Rate of interest being the same)

Q.4. If 30 goats can graze a field in 15 days, how many goats will graze the same field in 10 days?

Q.5. 120 men had food provision for 200 days. After 5 days. 30 died due to an epidemic. How long will the remaining food last?

Q.6. Uday can finish a book in 25 days if he reads 18 pages everyday. How many days will he take to finish it, if he reads 15 pages every day?

(MCQ) Direct and Inverse variation

1. If two quantities x and y vary directly, then

(i) $x \times y$ is constant *(iii)* x/y is constant

(ii) $x - y$ is constant *(iv)* $x + y$ is constant

2. If two quantities x and y vary inversely then

(i) $x + y$ is constant (iii) $x - y$ is constant

(ii) $x \times y$ is constant (iv) x/y is constant

3. If 8:12::6:a, the value of a is
   (i) 6 *(iii)* 9
   (ii) 8 *(iv)* 10

4. If 16×9=12×m, the value of m is
   (i) 10 *(iii)* 15
   (ii) 12 *(iv)* 14

5. If the cost of 18 pens is Rs. 234, a dozen pen will cost
   (i) Rs 194 *(iii)* Ra 180
   (ii) Rs 200 *(iv)* Rs 156

6. Raju earns Rs 1440, if he works for 12 days. If he works for 30 days, he will earn
   (i) Rs 4000 *(iii)* Rs 4800
   (ii) Rs 3600 *(iv)* Rs 5000

7. A tree of 20m height casts a shadow 8 m long, what is the height of a tree that casts a shadow 10 m long
   (i) 25 m *(iii)* 15 m
   (ii) 30 m *(iv)* 40 m

8. There is enough food to last for 40 people for 10 days. If 10 more people join them, the food will last for
   (i) 12 days *(iii)* 15 days
   (ii) 8 days *(iv)* 6 days

9. A car is traveling at a speed of 54 km/ hour, covers a distance in 2.5 hours. At a speed of 45 km/hr, it covers the same distance in
   (i) 4 hours *(iii)* 3.5 hours
   (ii) 5 hours *(iv)* 3 hours

10. 25 labourers can build a wall in 4 days. IF only 20 labourers report for work, the wall be built in
    (i) 6 days *(iii)* 5 days
    (ii) 4 days *(iv)* 4½ days

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Module – 13

Comparing Quantities

Q.1. The list price of a table fan is Rs. 960 and is available to a retailer at 25% discount. For how much should the retailer sell it to gain 15%.

Q.2. Sumit saves 14% of his salary, while Gaurav saves 22%. If both get the same salary and Gaurav saves Rs. 1540, find their salaries & Sumit's savings.

Q.3. A man bought two T.V. sets for Rs. 42500. He sold one at a loss of 10% and the other at a profit of 10%, If the S.P of each T.V is the same, determine the C.P of each set.

Q.4. By selling 288 hens, Tina lost the S.P. of 12 hens. Find the loss percent.

Q.5. In what time will Rs. 64000 amount to Rs. 68921 at 2½% per annum when the interest is being compounded annually.

Q.6. A dishonest dealer promises to sell his goods at cost price, but he uses a weight of 960 grams for 1 kg. Find his gain percent.

Q.7. Toshiba bought 100 hens for Rs 8000 and sold 20 of these at a gain of 5 %. At what gain percent she must sell the remaining hens so as to gain 20% on the whole transaction?

Q.8. Find the C.I. on Rs 24000 at 15% per annum for $2\frac{1}{3}$ years.

Q.9 At what rate % per annum will a sum of Rs 4000 yield compound interest of Rs 410 in 2 years?

(MCQ) Comparing Quantities

1. 105% of Rs 620 is
   (i) Rs 650 *(iii)* Rs 651
   (ii) Rs 700 *(iv)* Rs 720

2. If 12% of x is 60 then x is
   (i) 400 *(iii)* 600
   (ii) 500 *(iv)* 700

3. Profit or loss is calculated on
   (i) Cost price *(iii)* Marked price
   (ii) Sales price *(iv)* None of these

4. If a chair costing Rs 400 is sold for Rs 360, the loss is
   (i) 30% *(iii)* 40%
   (ii) 60% *(iv)* 10%

5. A shirt marked Rs 500 is sold for Rs 400,so the discount is
   (i) 10% *(iii)* 5%
   (ii) 20% *(iv)* 25%

6. Comparing the simple interest and compound interest (compounded annually) after one year on a certain sum, we conclude that
   (i) Simple interest is more *(iii)* Both are same
   (ii) Compound interest is more *(iv)* None of these

7. If Rs 1250 amounts to Rs 1600 in 3 years, the interest amount is
   (i) Rs 300 *(iii)* Rs 350
   (ii) Rs 250 *(iv)* Rs 400

8. A car costs Rs 1,00,000. If depreciation is 10%, how much will it cost after 2 years?
   (i) Rs 90,000 *(iii)* Rs 75,000
   (ii) Rs 80,000 *(iv)* Rs 81,000

9. How much will Rs 50,000 amount to in 2 years at 5% interest rate compounded annually.
   (i) Rs 55,000 *(iii)* Rs 55,125
   (ii) Rs 65,000 *(iv)* Rs 70,000

10. The C.P of 4 articles is equal to S.P of 5 articles. In this transaction there is
    (i) a loss *(iii)* No loss no gain
    (ii) a gain *(iv)*None of these

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Module – 14
Exponents And Powers

Q.1. Express the following in standard form:

(i) Mass of Earth = 5,976,000,000,000,000,000,000,000 kg= _____
(ii) The distance between sun and earth 149,600,000,000m = _____
(iii) 0.00072984= _____
(iv) 4 ÷ 100000= _____

Q.2. Express the following numbers in usual form:

(i) 3.61492×10^{6}= _____
(ii) 7.54×10^{-4} = _____
(iii) 3×10^{-7} = _____

Q.3. For a non zero rational number 'a', $a^7 \div a^{12}$ is equal to _____.

Q.4. Find the value of *x*

(i) $2^{x-3} = 1$ (Ans:x=3) *(ii)* $(\frac{2}{9})^3 \times (\frac{2}{9})^{-6} = (\frac{2}{9})^{2x-1}$ (Ans: –1)

(iii) $3^x = \frac{1}{9}$ (Ans:x=–2) *(iv)* $2^{2x+2} = 4^{2x-1}$ (Ans: 2)

Q.5. Simplify:

(i) $\frac{2^{-3}x^{-2}y^4z^5}{2^{-3}x^2y^{-1}z^5}$

(ii) $\left\{(\frac{1}{3})^{-2} - (\frac{1}{2})^{-3}\right\} \div (\frac{1}{4})^{-2}$

(iii) $(6^{-1} - 8^{-1})^{-1} \div (2^{-1} - 3^{-1})^{-1}$

(iv) $(\frac{3^{-2}}{5})^{-2}$

(v) $\left(6^{-1} - 8^{-1}\right)^{-1} + \left(2^{-1} - 3^{-1}\right)^{-1}$

Q.6. By what number should $(-24)^{-1}$ be divided so that the quotient may be 3^{-1}.

(MCQ) Exponents and Powers

1. The reciprocal of $\left[\frac{2}{3}\right]^{-4}$ is

(i) $\left[\frac{2}{3}\right]^4$ *(iii)* $\left[\frac{3}{2}\right]^0$

(ii) $\left[\frac{2}{3}\right]^0$ *(iv)* None of these

2. The values of $\left(\frac{3}{8}\right)^0 \times \left(\frac{7}{8}\right)^0$ is

(i) 1 (iii) $\frac{7}{8}$

(ii) $\frac{3}{8}$ (iv) 0

3. The value of $5^{-1} - 6^{-1}$ is

(i) –1

(ii) $\frac{1}{30}$

(iii) $\frac{-1}{30}$

(iv) 1

4. The value $\left(7^{-1}\right)^{-2}$ is

(i) 7

(ii) $\frac{1}{7}$

(iii) 49

(iv) –7

5. The value of $3^{-1} \div 3^{-2}$ is

(i) 9

(ii) 3

(iii) $\frac{1}{3}$

(iv) $\frac{-1}{3}$

6. $\left(\frac{2}{3}\right)^{-5}$ is same as

(i) $\frac{2}{3 \times 5}$

(ii) $\left(\frac{-2}{5}\right)^{3}$

(ii) $\frac{2 \times (-5)}{3}$

(iv) $\left(\frac{3}{2}\right)^{5}$

7. The value of $2^{-3} \times 3^{-3}$ is

(i) 6

(ii) $\frac{1}{6}$

(iii) $\frac{1}{216}$

(iv) –6

8. If $3^3 \times 3^{x-2} = 3^{-2}$ then the value of x is

(i) 0

(ii) 3

(iii) –3

(iv) $\frac{1}{3}$

9. The value of $\left[(-1)^{-3}\right]^5 \times 5^0$ is

(i) –35 *(iii)* –1
(ii) 40 *(iv)* 1

10. $a^m \times b^m$ will be equal to

(i) a^{m+n} *(iii)* $\left(\frac{a}{b}\right)^m$

(ii) $(ab)^m$ *(iv)* 1

==========

Module – 15
Factorisation

Q.1. Find the common factors of the given terms:

(i) $36xy, 12y$ *(ii)* $10x^2, -18x^3, 14x^4$

(iii) $12a^2b, 15ab^2$

Q.2. Factorise:

(i) $9x^2 + 25y^2 + 30xy$
(ii) $36y^2 - 36y + 9$
(iii) $a^2 - b^2 - a - b$
(iv) $x^5 - 16x^3$
(v) $k - 7 + 7lm - lmk$
(vi) $x^2 - 11x - 42$
(vii) $2y - 32y^5$
(viii) $(2r - 5)^2 + (2r - 5)$

Q.3. Divide:

(i) $24\ (x^2yz + xy^2z + xyz^2)$ by $8xyz$
(ii) $z\ (5z^2 - 80)$ by $5z\ (z + 4)$
(iii) $24xy^2z^3$ by $6yz^2$
(iv) $63\ a^2b^4c^6$ by $7a^2b^2c^3$

Q.4. Find and Correct the errors:

(i) $(x - 5)^2 = x^2 - 25$

(ii) $(2x)^2 = 2x^2$
(iii) $(x + 8)^2 = x^2 + 64$
(iv) $3(x - 4) = 3x - 4$

Q.5. Factorise:

(i) $3m^2 + 24m + 36$

(ii) $4y^2 - 8y + 3$

(iii) $15 - 16yz - 15y^2z^2$

(iv) $9 - a^6 + 2a^3b^3 - b^6$

(MCQ) Factorisation

1. The H.C. F of the three terms $15a^2b^2, -20a^3b, 10ab^2$ is
   (i) $5a^2b^2$ *(iii)* $10ab^2$
   (ii) $5ab$ *(iv)* $10ab$

2. The H.C.F of $56m^4, 64m^3 - 40m^2n, 48m^2n^2$ is
   (i) $16m$ *(iii)* $7m^2n^2$
   (ii) $8m^2n$ *(iv)* $8m^2$

3. $\left(4a^2 - 4ab + b^2\right) \div \left(2a - b\right)$ is the same as
   (i) $\left(2a + b\right)$ *(iii)* $\left(2a - b\right)$
   (ii) $2a^2 - b^2$ *(iv)* $4a + b$

4. $9m^2 + 12mn + 4n^2$ is the same as
   (i) $\left(3m - 2n\right)^2$ *(iii)* $\left(3m + 2n\right)\left(3m - 2n\right)$
   (ii) $\left(3m + 2n\right)^2$ *(iv)* None of these

5. $121d^2 - 25$ is the same as
   (i) $\left(11d - 5\right)^2$ *(iii)* $\left(11d + 5\right)\left(11d - 5\right)$
   (ii) $\left(11d + 5\right)^2$ *(iv)* $\left(11d\right)^2 + \left(5\right)^2$

6. The product of (a – 7) (a + 2) will be
   (i) $a^2 - 14$ *(iii)* $a^2 + 9a + 14$
   (ii) $a^2 - 5a - 14$ *(iv)* None of these

7. Two numbers whose sum is (–2) and product is (–99) are
   (i) 9 and 11 *(iii)* –11and 9
   (ii) –9 and –11 *(iv)* –9 and 11

8. $x^2+(a+b)x+ab$ is the same as
   (i) $(x+ab)^2$ *(iii)* $(x+a)(x+b)$
   (ii) $(x+a+b)^2$ *(iv)* $(x+a)(x-b)$

9. The factorisation of $x^2-10x+21$ is
   (i) $(x-7)(x+3)$ *(iii)* $(x+7)(x-3)$
   (ii) $(x+7)(x+3)$ *(iv)* $(x-7)(x-3)$

10. The factorization of $p^2+6p-16$ is
   (i) $(p+8)(p-2)$ *(iii)* $(p-8)(p+2)$
   (ii) $(p+8)(p+2)$ *(iv)* $(p-8)(p-2)$

==========

Module – 16
Practical Geometry

Construct the following quadrilaterals with the given measurements:

Q.1 **Quadrilateral PQRS, QR = 7.5cm, RP=PS = 6 cm, RS = 5cm, and QS=10cm. Measure the fourth side.**

Q.2 **Quadrilateral ABCD, AB = 3.5cm, BC=2.5cm, CD= 4 cm, $\angle B = 60^0$, $\angle C = 2\angle B$**

Q.3 **Construct a square whose one diagonal AC = 7cm.**

Q.4 **Construct a rhombus PQRS whose one side PQ is 5 cm and diagonal PR is 6cm. Measure the length of the other diagonal.**

(MCQ) Practical Geometry

1. In the quadrilateral ABCD, the diagonals are
   (i) AB and CD
   (ii) BC and AD
   (iii) AC and BD
   (iv) CD and BC

2. In a parallelogram PQRS, the measure of $\angle P = 75°$, so the measure of $\angle Q$ will be
   (i) 75°
   (ii) 100°
   (iii) 105°
   (iv) None of these

3. If we draw one diagonal of a rectangle, we get two triangles which are
   (i) Scalene
   (ii) Isosceles
   (iii) Equilateral
   (iv) None of these

4. If we draw one diagonal of a square, we get two triangles which are
   (i) Right angled
   (ii) Acute angled
   (iii) Obtuse angled
   (iv) None of these

5. The length of one diagonal of a rectangle is 6.2 cm, so the length of the other diagonal is
   (i) 8.4 cm
   (ii) 3.1 cm
   (iii) 12.4 cm
   (iv) 6.2 cm

6. In which quadrilateral only one diagonal is bisected?
   (i) Square
   (ii) Rectangle
   (iii) Rhombus
   (iv) Kite

7. To construct a unique quadrilateral, how many specific measurements need to be known?
   (i) 8
   (ii) 10
   (iii) 5
   (iv) 6

8. The diagonals of which quadrilateral bisect each other at right angles?
   (i) Kite
   (ii) Trapezium
   (iii) Rectangle
   (iv) Square

9. We get four congruent triangles, when we draw the two diagonals of which quadrilateral?
   (i) Square
   (ii) Rhombus
   (iii) Parallelogram
   *(iv)*None of these

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Module – 17 (a)
Visualising Solid Shapes

Aim: To make the net of the following 3 dimensional shapes.

(i) Cylinder
(ii) Cone
(iii) Triangular prism
(iv) Pyramid with square based

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Module – 17 (b)

Playing With Numbers

Q.1. Write the following numbers in generalized form:

(i) 85 *(ii)* 502

Q.2. Write the following in the usual form:

(i) $100 \times 4 + 10 \times 9 + 1 \times 7$ *(ii)* $10 \times 3 + 7$
(iii) $10 \times 5 + 2$ *(iv)* $100 \times c + 10 \times a + b$

Q.3. Find A and B in the addition and give reasons for the steps involved.

(i)
$$\begin{array}{r} A \\ A \\ +\ A \\ \hline BA \end{array}$$

(ii)
$$\begin{array}{r} 2\,A\,B \\ +\ A\,B\,1 \\ \hline B\,1\,8 \end{array}$$

Q.4. If 715C62 is a multiple of 9 where 'C' is a digit, what is the value of C?

Q.5. If 21A43 is a multiple of 3 where 'A' is a digit, what are the possible values of A?

Q.6. If 169 is divided by xy then quotient is xy, find the value of x & y.

Q.7. If 1331 is divided by xx, then quotient is xyx, then find x & y.

(MCQ) Playing With Numbers

1. The number 68* is divisible by 10, so * stand for

(i) 5 *(iii)* 2
(ii) 0 *(iv)* None

2. The number 1234 * 72 is divisible by 9, so * stands for
   (i) 0 *(iii)* 5
   (ii) 1 *(iv)* 8

3. The next term in the sequence 1, 4, 9, 16, 25, _____ is
   (i) 40 *(iii)* 30
   (ii) 36 *(iv)* 45

4. If 17Δ1=17, then 286Δ1 is equal to
   (i) 286 *(iii)* 186
   (ii) 17 *(iv)* 0

5. If 24□ 4=6, then 50 □ 10 is equal to
   (i) 10 *(iii)* 40
   (ii) 25 *(iv)* 5

6. If (7Δ3)01=10, then (8Δ2)02 is equal to
   (i) 20 *(iii)* 10
   (ii) 16 *(iv)* 40

7. A number divisible by 9 and 10 both is
   (i) 2727 *(iii)* 8190
   (ii) 3160 *(iv)* 10000

8. On dividing 3672894 by 9, the remainder is
   (i) 0 *(iii)* 3
   (ii) 2 *(iv)* None

PROBLEM SOLVING ASSESSMENT

1. In a certain language, if 1 is coded as A, 2 as B, 3 as C and so on, how is FLOWER coded in that code?
   (i) 6121523515 *(ii)* 6121823515
   (iii) 6211523518 *(iv)* 6218123515

2. If OX is coded as 39, what will be the code number for LION?
   (i) 20 *(ii)* 25
   (iii) 38 *(iv)* 50

3. In a certain code language '247' means 'spread red carpet', '256' means 'dust one carpet' and '234' means 'roll red carpet'. Which digit in that code means 'dust'?

(i) 2 *(ii)* 3
(iii) 5 *(iv)* cannot be determined.

4. In a certain code BEAUTIFUL is coded as 573041208, BUTTER as 504479, how is FUTURE coded in that code?

(i) 201497 *(ii)* 204097
(iii) 704092 *(iv)* 204079

5. In a certain language, if T is coded as 9, G as 7, R as 1, I as 0 and E as 3, how is tiger coded in that code?

(i) 90731 *(ii)* 19037
(iii) 91073 *(iv)* 71903

6. In a certain code, if TREE is coded as 7100, FROG as 2159, how is FREE coded in that code?

(i) 2100 *(ii)* 3100
(iii) 1003 *(iv)* 1002

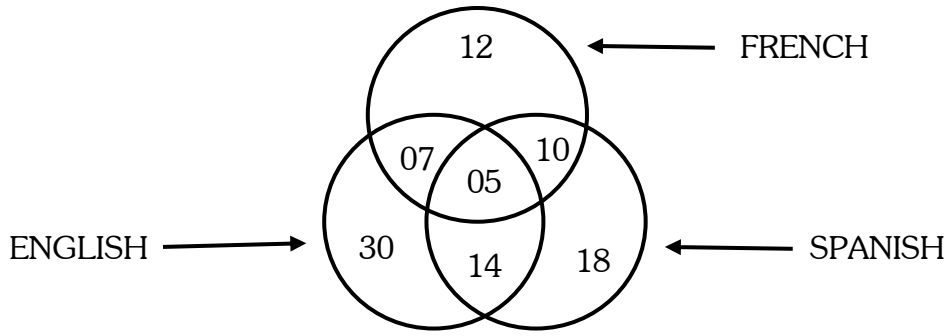
7. If BAD = 7, ACE = 9, then PAN is

(i) 31 *(ii)* 13
(iii) 208 *(iv)* 469

8. If BAD = 214, ACE = 135, then HEAD is

(i) 5814 *(ii)* 8514
(iii) 1485 *(iv)* 4158

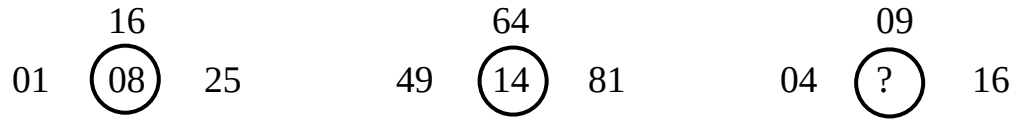
9. A diagram in which three circles are interlocked in given below. Different regions are indicated in the diagram.



How many students know both English and Spanish but not French?

(i) 5 *(ii)* 7 *(iii)* 12 *(iv)* 24

Q.10. Identify the number that can replace the mark "?"



(i) 6 *(ii)* 7 *(iii)* 8 *(iv)* 9

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Module – 18

Revision For Summative Assessment-II

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MCQ SOLUTIONS

Rational Numbers

1.	(ii)	5.	(iii)	9.	(iii)
2.	(i)	6.	(iii)	10.	(i)
3.	(iv)	7.	(iv)	11.	(i)
4.	(iv)	8.	(iii)		

Square and Square Roots

1.	(iii)	5.	(i)	9.	(iii)
2.	(iv)	6.	(i)	10.	(iii)
3.	(iv)	7.	(iv)		
4.	(iii)	8.	(iii)		

Cubes and Cube Roots

1.	(iii)	5.	(ii)	9.	(i)
2.	(i)	6.	(iv)	10.	(i)
3.	(iiii)	7.	(i)		
4.	(i)	8.	(i)		

Understanding Quadrilaterals

1.	(ii)	5.	(ii)	9.	(iii)
2.	(i)	6.	(i)	10.	(iii)
3.	(iv)	7.	(iii)	11.	(i)
4.	(ii)	8.	(ii)		

Algebraic Expressions and Identities

1.	(i)	5.	(ii)	9.	(iv)
2.	(ii)	6.	(iv)	10.	(iii)
3.	(iii)	7.	(ii)		
4.	(i)	8.	(ii)		

Linear Equation in one Variable

1.	(ii)	5.	(ii)	9.	(i)
2.	(iv)	6.	(ii)	10.	(ii)
3.	(iv)	7.	(i)		
4.	(iii)	8.	(iv)		

Data Handling

1.	(ii)	4.	(iv)	7.	(iv)
2.	(iv)	5.	(iv)	8.	(ii)
3.	(iii)	6.	(iii)		

Introduction to Graph

1.	(iii)	4.	(i)	7.	(iv)
2.	(ii)	5.	(ii)	8.	(iii)
3.	(i)	6.	(i)	9.	(iii)

Mensuration

1.	(i)	8.	(ii)	15.	(i)
2.	(iii)	9.	(ii)	16.	(ii)
3.	(ii)	10.	(ii)	17.	(iv)
4.	(iii)	11.	(ii)	18.	(i)
5.	(i)	12.	(iii)	19.	(ii)
6.	(iv)	13.	(iii)		
7.	(i)	14.	(iii)		

Practical Geometry

1.	(iii)	4.	(i)	7.	(iii)
2.	(iii)	5.	(iv)	8.	(iv)
3.	(i)	6.	(iv)	9.	(i)

Comparing Quantities

1.	(iii)	5.	(ii)	9.	(iii)
2.	(ii)	6.	(iii)	10.	(i)
3.	(i)	7.	(iii)		
4.	(iv)	8.	(iv)		

Exponents and Powers

1.	(i)	3.	(ii)	5.	(ii)
2.	(i)	4.	(iii)	6.	(iv)

7. (iii)
8. (iii)
9. (iii)
10. (ii)

Factorisation

1. (ii)
2. (iv)
3. (iii)
4. (ii)
5. (iii)
6. (ii)
7. (iii)
8. (iii)
9. (iv)
10. (i)

Direct and Inverse Variations

1. (iii)
2. (ii)
3. (iii)
4. (ii)
5. (iv)
6. (ii)
7. (i)
8. (ii)
9. (iv)
10. (iii)

Playing With Numbers

1. (ii)
2. (iv)
3. (ii)
4. (i)
5. (iv)
6. (i)
7. (iii)
8. (iii)

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MODEL TEST PAPER SUMMATIVE ASSESSMENT-I

(Solved)

Time: 3hr **Max Marks: 80**

General Instruction –

1. Section A Q.1. to Q.10. carry 1 mark each.
2. Section B Q.11. to Q.20. carry 2 marks each.
3. Section C Q.21. to Q.30. carry 3 marks each.
4. Section D Q.31. to Q.35. carry 4 marks each.
5. All questions are compulsory.

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Section - A

Q.1. The additive Inverse of $\frac{-16}{-7}$ is

(i) $\frac{16}{-7}$ ***(ii)*** $\frac{16}{7}$

(iii) $\frac{7}{16}$ ***(iv)*** $\frac{-7}{-16}$

Q.2. The cube root of (– 1000) is

(i) 10 ***(ii)*** – 10

(iii) 100 ***(iv)*** – 100

Q.3. What is the negative of a negative rational number.

(i) Negative ***(ii)*** positive

Q.4. Every rational number is an integer

(i) True ***(ii)*** False ***(iii)*** not always true

Q.5. For an integer a, a^3 is always positive.

(i) True ***(ii)*** False ***(iii)*** not always true

Q.6. The sum of ab, –bc, ca, –ab, –ca & bc is

(i) –ab ***(ii)*** 0

(iii) ab ***(iv)*** none of these

Q.7. The coefficient of m is –9mx + 4 is

(i) – 9 ***(ii)*** 0

(iii) – 9*x* ***(iv)*** 9*x*

Q.8. The constant in $x^2 - 3$ is

(i) -1 ***(ii)*** 1
(iii) 3 ***(iv)*** -3

Q.9. Product of $(\frac{1}{2}a - \frac{1}{5}b)$ and $(\frac{1}{2}a + \frac{1}{5}b)$ is

(i) $\frac{1}{4}a^2 + \frac{1}{25}b^2$ ***(ii)*** $\frac{1}{4}a^2 - \frac{1}{25}b^2$
(iii) $\frac{1}{25}a^2 - \frac{1}{4}b^2$ ***(iv)*** none of these

Q.10. If $x = 3$, which expression has a different value from the other three?

(i) $x^2 + 9x$ ***(ii)*** $2x^2$
(iii) $12x$ ***(iv)*** $x^2 (x - 1)^2$

Section – B

Q.11. Find the square root of $\sqrt{49} \times \sqrt{144}$

Q.12. Is 256 a perfect cube? Show steps.

Q.13. Plot $\frac{-2}{5}$ and $\frac{2}{5}$ on the same number line.

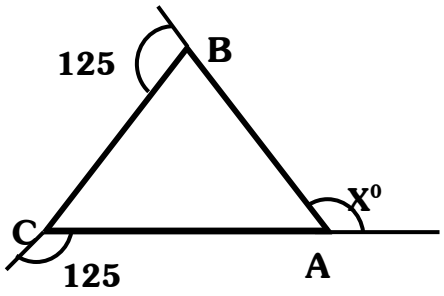
Q.14. Is (6, 9, 11) a Pythagorean triplet? (Show).

Q.15. Express $(2x + 3y^3)^2$ as a trinomial.

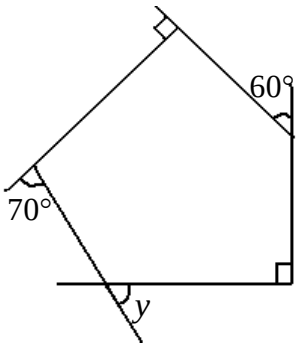
Q.16. Rohan rolls a die. What are the chances of getting a number which is even?

Q.17. Find the number of sides of regular polygon whose each exterior angle has a measure of 45^0.

Q.18. Find the measure of *x*.



Q.19. Find the measure of y.



Q.20. Solve : $\frac{x^2 - 9}{5 + x^2} = \frac{-5}{9}$

Section – C

Q.21. Evaluate : √9.3025

Q.22. The denominator of a rational number is greater than its numerator by 3. If 3 is subtracted from the numerator and 2 is added to its denominator, the new number becomes 1/5. Find the original number.

Q.23. The area of square field is $101\frac{1}{400}$ **m sq. Find the length of its side.**

Q.24. The sum of 2 rational numbers is $\frac{-3}{5}$ **If one of the number is** $\frac{-9}{20}$**, find the other.**

Q.25. Solve : $\frac{x + b}{a - b} = \frac{x - b}{a + b}$

Q.26. The ratio of 2 sides of a parallelogram is 3:5 and its perimeter is 48m. Find the length of the sides of the parallelogram.

Q.27. The volume of a cubical box is 13.824 cubic metres. Find the length of each side of the box.

Q.28. Find the cube root of 438976.

Q.29. Find the smallest four digit number which is a perfect square.

Q.30. Find 3 rational numbers between 1 and – 1.

Section – D

Q.31. Construct the histogram based on the data given below. It represents the number of miles per gallon of gasoline obtained by 40 drivers of compact cars in a large city.

Interval	16-19	20-23	24-27	28-31	32-35	36-39	40-43
Frequency	5	11	8	5	7	3	1

Answer the following questions:

(i) What is the number of cars reporting mileages between 28 and 31 miles per gallon?

(ii) How many cars reported mileages greater than 31 miles per gallon?

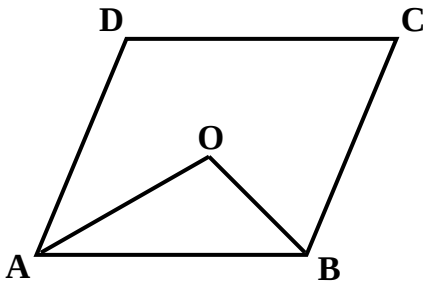
(iii) What percent of the cars reported mileages from 24-27 miles per gallon?

Q.32. Construct a quadrilateral PQRS, PQ = 5.5 cm, QR= 4 cm, RS = 4.4 cm, and PS=3.2 cm and $\angle P = 75^0$.

Q.33. Find the product of $\left(y + \frac{2}{7}y^2\right)$ and $(7y - y^2)$ and verify the result for $y = 3$.

Q.34. If $4x^2 + y^2 = 40$ and $xy = 6$. Find the value of $2x + y$.

Q.35. In a parallelogram ABCD, the bisectors of angle A and angle B meet at O. Find angle AOB.



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SOLUTIONS

Q.1. (a) Q.2. (b) Q.3. (b)
Q.4. (b) Q.5. (b) Q.6. (b)
Q.7. (c) Q.8. (d) Q.9. (b)
Q.10. (b)

Section-B

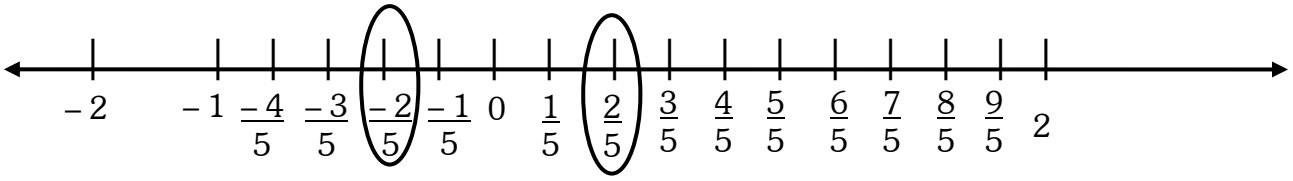
Q.11. $\sqrt{49} \times \sqrt{144}$

$= \sqrt{7\times7} \times \sqrt{3\times3\times4\times4}$

$= 7 \times 3 \times 4 = 7 \times 12 = 84$

Q.12. Resolving 256 into prime factors
We have
$256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
clearly in grouping the factors in triples of equal factors. We are left with two factors
2×2. Therefore 256 is not a perfect cube.

Q.13. $\frac{2}{5}$ and $\frac{-2}{5}$ on the number line.



Q.14. To form a Pythagorean Triplet, the number should be 2m, (m^2-1), (m^2+1)
$(2m)^2 + (m^2-1)^2 = (m^2+1)^2$
$6^2 + 9^2 = 11^2$
$36 + 81 \neq 121$

$\therefore$ 6, 9, 11 does not form a Pythagorean Triplet

Q.15. $(2x + 3y^3)^2$ as a trinomial
Using $(a + b)^2 = a^2 + 2ab + b^2$
$= (2x)^2 + (3y^3)^2 + 2 \times 2x \times 3y^3$
$= 4x^2 + 9y^6 + 12xy^3$

Q.16. Total numbers appearing on the dice = 6
Chances of getting even numbers on a die (2, 4, 6) = $\frac{3}{6} = \frac{1}{2}$

Q.17. Total measure of all exterior angles of a polygon = 360^0

Measure of each exterior Angle = 45^0

$\therefore$ The number of exterior angles = $\frac{360^0}{45^0} = 8$

The polygon has 8 sides.

Q.18. Since the sum of of the measures of exterior angles of a polygon is 360^0

$\therefore \; 125^0 + x^0 + 125^0 = 360^0$

$\Rightarrow \quad 250^0 + x^0 = 360^0$

$\Rightarrow \quad x^0 = 360^0 - 250^0 = 110^0$

Q.19. Since the sum of of the measures of exterior angles of a polygon is 360^0

$\therefore \; y^0 + 90^0 + 60^0 + 90^0 + 70^0 = 360^0$

$\Rightarrow \quad y^0 + 310^0 = 360^0$

$\Rightarrow \quad y^0 = 360^0 - 310^0 = 50^0$

Q.20. $\frac{x^2 - 9}{5 + x^2} = \frac{-5}{9}$

By cross multiplication

$\Rightarrow \quad 9(x^2 - 9) = -5(5 + x^2)$

$\Rightarrow \quad 9x^2 - 81 = -25 - 5x^2$

$\Rightarrow \quad 9x^2 + 5x^2 = -25 + 81$

$\Rightarrow \quad 14x^2 = 56$

$\Rightarrow \quad x^2 = \frac{56}{14} \quad => \quad x^2 = 4 \quad => \quad x^2 = 2^2 \quad => \quad x = 2$

Q.21. 3.05

$\sqrt{9.3025} \quad = \quad \sqrt{9.3025} = 3.05$

Q.22. Let the numerator be x.

Then, the denominator = $(x + 3)$

$\therefore \quad \frac{x - 3}{(x + 3) + 2} = \frac{1}{5}$

$=> \quad \frac{x - 3}{x + 5} = \frac{1}{5} \quad => \quad 5(x-3) = (x+5) \quad => \quad 5x - 15 = x + 5$

$=> \quad 4x = 20 \quad => \quad x = 5$

Numerator = 5

$\therefore$ Denominator = $(5 + 3) = 8$

$\therefore$ The required number is $\frac{5}{8}$

Q.23. Let the length of one side of the square field be x metres.

$\therefore$ Area of the field = x^2

Given:

Area of the field = $101\ \frac{1}{400}\ m^2$

$$x^2 = \frac{40401}{400}\ m^2$$

$$\therefore x = \sqrt{\frac{40401}{400}} \quad => \quad x = \frac{\sqrt{40401}}{\sqrt{400}}$$

$$\therefore x = \frac{\sqrt{40401}}{\sqrt{400}} = \frac{201}{20}$$

Hence, the length of one side of the field is $\frac{201}{20}$ m.

Q.24. Given,

Sum of 2 rational numbers $= \frac{-3}{5}$

One of the rational numbers = $\frac{-9}{20}$

Let the other number = x

$$\therefore x + \left(\frac{-9}{20}\right) = \frac{-3}{5}$$

$$\Rightarrow \quad x = \frac{-3}{5} - \left(\frac{-9}{20}\right)$$

$$\Rightarrow \quad x = \frac{-3}{20} + \frac{9}{20} = \frac{-12+9}{20} = \frac{-3}{20}$$

Q.25. $\frac{x+b}{a-b} = \frac{x-b}{a+b}$

By cross multiplication

$\Rightarrow \quad (x + b) \times (a + b) = (x - b) \times (a - b)$

$\Rightarrow \quad x(a + b) + b(a + b) = x(a - b) - b(a - b)$

$\Rightarrow \quad ax + bx + ab + b^2 = ax - bx - ab + b^2$

$\Rightarrow \quad ax - ax + bx + bx = -ab + b^2 - ab - b^2$

$\Rightarrow \quad 2bx = -2ab$

$\Rightarrow \quad x = \frac{-2ab}{2ab} = \therefore \quad x = -a$

Q.26. Let one side of a parallelogram = $3x$ m

& the other side of parallelogram = $5x$ m

Perimeter = 2 (l + b)
= 2(3x + 5x)
= 2 × 8x = 16x m
Given Perimeter = 48m

$\therefore$ 16x = 48 $\quad x = \frac{48}{16} \quad x$ = 3 m

Hence the side of the parallelogram are :
3x = 3 × 3 = 9m
5x = 5 × 3 = 15m

Q.27. Given volume of a cubical box = 13.824 m^3
$V = l^3$ = l^3 = 13.824
$l = \sqrt[3]{13.824}$

$\sqrt[3]{13824} = \underline{2\times2\times2} \times \underline{2\times2\times2} \times \underline{2\times2\times2} \times \underline{3\times3\times3}$

Cube root = 2 × 2 × 2 × 3
= 24

$\sqrt[3]{13.824} = 2.4$
$\therefore$ Length of each side of the box = 2.4m

2	13824
2	6912
2	3456
2	1728
2	864
2	432
2	216
2	108
2	54
3	27
3	9
3	3
	1

Q.28. Cube root of 438976

438976 = $\underline{2\times2\times2} \times \underline{2\times2\times2} \times \underline{19\times19\times19}$

Cube root = 2 × 2 × 19
= 76

$\sqrt{438976} = 76$

2	438976
2	219488
2	109744
2	54872
2	27436
2	13718
19	6859
19	361
19	19
	1

Q.29. Smallest 4 digit no = 1000

$(32)^2$ – 1000 should be added to 1000 to make it a perfect square.
1000 + 24 =1024

	3 1
3	1000
	9
61	100
	61
	39

1024 is the smallest 4 digit number which is a perfect square.

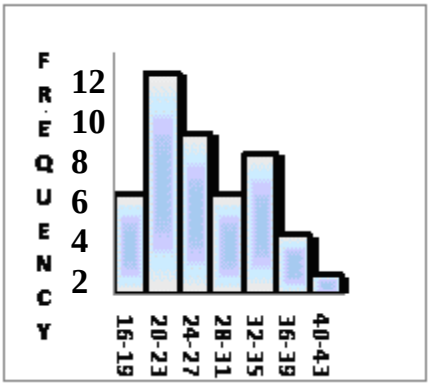
Q.30. $\frac{1}{1} \times \frac{10}{10}$, $\frac{-1}{1} \times \frac{10}{10}$

$\frac{-10}{10}$, , $\frac{-8}{10}$, $\frac{-7}{10}$ – – – – – – – – $\frac{8}{10}$, $\frac{9}{10}$, $\frac{10}{10}$

∴ The four rational numbers are:

$\frac{-9}{10}$, $\frac{-7}{10}$, $\frac{-6}{10}$, $\frac{4}{10}$

Q.31.



(i) 5 cars

(ii) 32 – 35 = 7 => 36 – 39 = 3 => 40 – 43 =1

Total= 7+3+1=11

(iii) The interval 24 – 27 has a frequency of 8.
Total frequency for this survey is 40.

Required percentage = $\frac{8}{40} \times 100$ = 20%

Q.32. Given

PQ = 5.5 cm

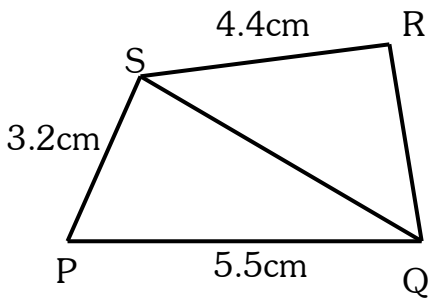
QR = 4cm

RS = 4.4 cm

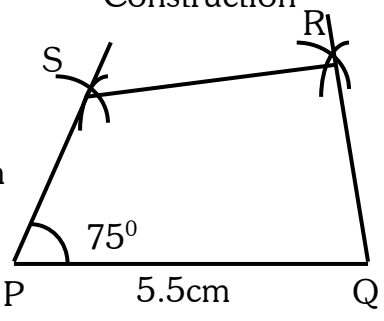
PS = 3.2cm

$\angle P = 75^0$

Rough figure



Construction



Q.33. $(y + \frac{2}{7} y^2) \times (7y - y^2)$

$\Rightarrow \quad y(7y - y^2) + \frac{2}{7} y^2 (7y - y^2)$

$\Rightarrow \quad 7y^2 - y^3 + 2y^3 - \frac{2}{7} y^4$

$\Rightarrow \quad 7y^2 + y^3 - \frac{2}{7} y^4 \quad = \quad$ Given $\quad y = 3$

$\Rightarrow \quad$ L.H.S. $\left(y + \frac{2}{7} y^2\right) \times (7y - y^2)$

$\Rightarrow \quad (3 + \frac{2}{7} \times 3^2) \times 7 \times 3 - (3)^2$

$\Rightarrow \quad (3 + \frac{2}{7} \times 9) \times (21 - 9)$

$\Rightarrow \quad (3 + \frac{18}{7}) \times 12$

$\Rightarrow \quad \frac{21 + 18}{7} \times 12$

$\Rightarrow \quad \frac{39}{7} \times 12 = \frac{468}{7}$

R.H.S: $\quad 7y^2 + y^3 - y^4$

$\Rightarrow \quad$ Given $y = 3$

$\Rightarrow \quad 7 \times 3^2 + 3^3 - \frac{2}{7} \times 3^4$

$\Rightarrow \quad 7 \times 9 + 27 - \frac{2}{7} \times 81$

$\Rightarrow \quad 63 + 27 - \frac{162}{7}$

$\Rightarrow \quad => \quad 90 - \frac{162}{7}$

$\Rightarrow \quad \frac{630 - 162}{7} = \frac{468}{7}$ Hence proved L.H.S = R.H.S.

Q.34. $(2x+y)^2 = (2x)^2 + y^2 + 2 \times 2x + y$

$\Rightarrow \quad (2x+y)^2 = (4x^2 + y^2) + 4xy$

$\Rightarrow \quad (2x+y)^2 = 40 + 4 \times 6$

$\Rightarrow \quad (2x+y)^2 = 64$

$a^2 + b^2 = a^2 + b^2 + 2ab$

Using $4x^2 + y = 40$
and $\quad xy = 6$

$\Rightarrow \quad (2x+y) = \sqrt{64} \quad => \quad 2x+y = 8$

Q.35. OA and O B are bisectors of angle A and angle B

$\therefore \angle OAB = \frac{1}{2} \angle A, \qquad \angle OBA = \frac{1}{2} \angle B$

In ΔAOB, using ASP

$\angle OAB + \angle AOB + \angle OBA = 180°$

$\frac{1}{2} \angle A + \angle AOB + \frac{1}{2} \angle B = 180°$

$\angle AOB = 180° - \frac{1}{2} (\angle A + \angle B)$

$\angle AOB = 180° - \frac{1}{2} (180°)$

[$\angle A$ and $\angle B$ are adjacent angles of parallogram ABCD]

$\angle AOB = 180° - 90° = 90°$

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MODEL TEST PAPER SUMMATIVE ASSESSMENT-I

(*Unsolved- 1*)

Time: 3hr. **Max Marks: 80**

General Instructions:-

1. Section A Q.1. to Q.10. carry 1 mark each.
2. Section B Q.11. to Q.20. carry 2 marks each.
3. Section C Q.21. to Q.30. carry 3 marks each.
4. Section D Q.31. to Q.35. carry 4 marks each.

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SECTION – 'A'

Q.1. In the equation $2x + y - 11 = 0$ the value of x when $y = 0$ is

(i) $\frac{2}{11}$ *(iii)* $\frac{-2}{11}$

(ii) $\frac{-11}{2}$ *(iv)* $\frac{11}{2}$

Q.2. One card is drawn from a pack of 52 cards. What is the probability that the card drawn is queen?

(i) $\frac{5}{22}$ *(iii)* $\frac{1}{7}$

(ii) $\frac{1}{13}$ *(iv)* $\frac{2}{52}$

Q.3. The smallest number by which 180 must be multiplied so that it becomes a perfect square is

(i) 6 *(ii)* 9 *(iii)* 3 *(iv)* 5

Q.4. If PQRS is a kite then PQ = _____.

(i) PS *(iii)* PR

(ii) SR *(iv)* QS

Q.5. If $72 \times k$ is a perfect cube, then the value of k is

(i) 9 *(ii)* 2 *(iii)* 3 *(iv)* 4

Q.6. The product of $\left(\frac{a}{b} - \frac{b}{a}\right)\left(\frac{a}{b} - \frac{b}{a}\right)$ is

(i) $\frac{a^2}{b^2}+\frac{b^2}{a^2}-2ab$

(ii) $\frac{a^2}{b^2}+\frac{b^2}{a^2}-2$

(iii) $\frac{a^2}{b^2}+\frac{b^2}{a^2}+2$

(iv) $\frac{a^2}{b^2}+\frac{b^2}{a^2}-\frac{2}{ab}$

Q.7. What is the sum of all the exterior angles of a 8 sided regular polygon?

(i) 1080^0

(ii) 720^0

(iii) 360^0

(iv) 135^0

Q.8. The product of $\frac{25}{14}$ and additive inverse of $\frac{-7}{5}$ is

(i) $\frac{125}{98}$

(ii) $\frac{-125}{98}$

(iii) $\frac{5}{2}$

(iv) None of these

Q.9. Number of non- squares lie between the squares of n & (n + 1)

(i) n

(ii) n^2

(iii) 2n

(iv) None of these

Q.10. The cube root of –1000 is

(i) 10

(ii) 100

(iii) –10

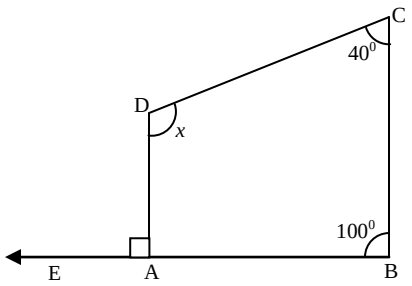
(iv) –100

SECTION – 'B'

Q.11. Three consecutive integers add up to 51. Find the integers.

Q.12. ABCD is a trapezium in which AB || CD. If $\angle A = 50^0$. What is the measure of $\angle D$?

Q.13. Find the measurement of unknown angle '*x*'.



Q.14. Following frequency distribution table shows marks (out of 50) obtained in English by 45 students of class VIII.

Class interval	Frequency
0 – 10	1
10 – 20	6
20 – 30	20
30 – 40	12
40 – 50	6
Total	45

(i) What is the size of class intervals?
(ii) Which class has the highest frequency?
(iii) What is the upper limit of the class interval 30 – 40?
(iv) Which two classes have the same frequency?

Q.15. The area of a square park is $30\frac{1}{4}m^2$. Find the length of each side of the park.

Q.16. *(i)* Express 81 as the sum of 9 odd numbers.
(ii) How many numbers lie between squares of 15 and 16?

Q.17. Is 53240 a perfect cube? Justify your answer.

Q.18. Subtract $-5(xy-y)$ from $2y(-11x+7)$.

Q.19. *(i)* Write a monomial with '*a*' and '*b*' as variables.
(ii) Identify the terms in the given expression and write their numerical coefficients. $\left(\frac{x}{2}-xy\right)$

Q.20. Simplify $n^2(n-2)+2n^3(n+3)-6n(n-4)$ and then find its value for $n=-1$.

SECTION – 'C'

Q.21. The adjacent angles of a parallelogram are in the ratio 2 : 3. Find the angles.

Q.22. Construct a quadrilateral ABCD where AB=4 cm, BC=5cm, CD=6.5cm and $\angle B=105^0$ and $\angle C=80^0$.

Q.23. Find the side of a cube when volume of cube is 2744 cm^3.

Q.24. The perimeter of a parallelogram is 180cm. One side exceeds the other by 10cm. What are the lengths of adjacent sides of the parallelogram?

Q.25. If $x+\frac{1}{x}=5$, find $x^2+\frac{1}{x^2}$.

Q.26. Find the square root of 37.0881 by division method.

Q.27. The four angles of a quadrilateral are x^0, $(x-10)^0$, $(x+30)^0$ and $2x^0$. Find all the angles of the quadrilateral and also write the greatest angle.

Q.28. Solve the following equation and check your result. $5x+\frac{7}{2}=\frac{3}{2}x-14$

Q.29. Find using appropriate properties. $\frac{1}{3}\times\frac{5}{6}+\frac{5}{2}+\frac{2}{3}\times\frac{1}{3}$

SECTION – 'D'

Q.30. Find the smallest 4-digit number which is a perfect square.

Q.31. On a particular day the sales (in rupees) of different items of a bakers shop are given below:

Item	Sales in (₹)
Ordinary bread	320
Fruit bread	80
Cakes and pastries	160
Biscuits	120
Others	40
Total	720

Draw a pie chart for this data.

Q.32. Construct a rhombus PQRS whose one side PQ=5cm and diagonal PR=6cm. Measure the length of the other diagonal.

Q.33. The sum of the digits of a 2-digit number is 12. If the number formed by reversing its digits is greater than the original number by 18. Find the original number.

Q.34. Find the least number that must be added to 1300 so as to get a perfect square. Also find the square root of the perfect square.

Q.35. Solve using suitable identity:

(i) $(x-10)(x+9)$ *(ii)* 56^2-44^2.

==========

MODEL TEST PAPER SUMMATIVE ASSESSMENT-I
(*Unsolved- 2*)

Time: 3hr. **Max Marks: 80**

GENERAL INSTRUCTIONS.

- Attempt all the questions neatly, showing the necessary working wherever required.
- Section-A (Q1- Q10): Each question carries 1 mark.
- Section-B (Q11- Q20): Each question carries 2 marks.
- Section-C (Q 21-Q 30): Each question carries 3 marks.
- Section-D (Q31- Q 35): Each question carries 4 marks.

==========

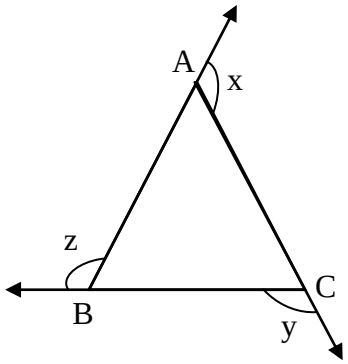
SECTION A

Q.1. The product of $\frac{5}{7}$ and the additive inverse of $\frac{-14}{10}$ is _____.

Q.2. How many natural numbers lie between squares of 25 and 26?

Q.3. The value of $\sqrt[3]{\frac{-64}{125}}$ is _____.

Q.4. Find the value of x + y + z in the give n figure :



Q.5. Simplify (x + 4) (x – 4).

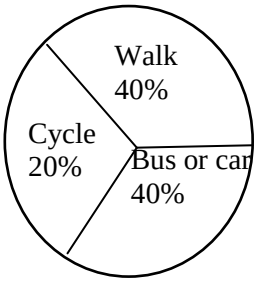
Q.6. If 5(x – 3) = –5 then x = _____.

Q.7. The class mark of the class interval 40- 50 is _____.

Q.8. If x = –1 then find the value of $x^3 + 2x^6$ is _____.

Q.9. Three angles of a quadrilateral are 70° each. What is the measure of the fourth angle ?

Q.10. In the given pie chart find the fraction of the circle representing Bus or Car as mode to transport.



SECTION B

Q.11. What should be added to $\frac{-9}{5}$ to get $\frac{-1}{3}$.

Q.12. A number multiplied by itself gives 676. Find the number.

Q.13. Evaluate: $\left\{\sqrt{4^2+3^2}\right\}^3$

Q.14. The exterior angle of a regular polygon is 24°. Find the number of sides of the polygon.

Q.15. By what least number should we multiply 240 to make it a perfect square?

Q.16. Find x if $6x = 23^2 - 17^2$.

Q.17. Solve for x: $9+5x=2\ (7x-9)$

Q.18. ABCD is a trapezium in which AB||CD. If $\angle A = \angle B = 40°$, then what is the measure of other two angles?

Q.19. Simplify: $17a^2 + 3a - 5a\ (a - 2)$

Q.20. Following frequency distribution table show marks (out of 50) obtained in Math Test by 45 students of class VIII.

Class Interval	Frequency
0- 10	1
10- 20	6
20- 30	12
30- 40	20
40- 50	6
Total	**45**

(i) What is the size of the class interval?

(ii) Which class has the highest frequency?

SECTION C

Q.21. Find six rational numbers between $\frac{-5}{3}$ and $\frac{-17}{6}$?

Q.22. Find the smallest number of 4 digits which is a perfect square.

Q.23. Solve for x: $\frac{x}{2}-\frac{1}{5}=\frac{x}{3}+\frac{1}{4}$

Q.24. Stating the property simplify the expression: $\left(\frac{9}{16}\times\frac{4}{12}\right)+\left(\frac{9}{16}\times\frac{-3}{9}\right)$

Q.25. Find the value of $(x^2 - 2y)(x + y)$ when $x = 1$ and $y = 2$.

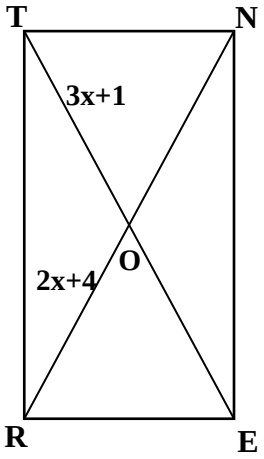
Q.26. The ratio between the interior angle and the exterior angle of a regular polygon is 7:2. Find the number of sides in the polygon.

Q.27. Solve: $\frac{3x+5}{2x+7}=4$.

Q.28. The volume of a cubical box is 32.768 cubic metre. Find the length of a side of the box.

Q.29. RENT is a rectangle with its dimensions in metres. It's diagonals meet at O.
If OR= 2x + 4, OT= 3x + 1. Find

(i) x
(ii) RN
(iii) TE



Q.30. The following table gives the marks scored by students in an entrance examination.

Marks	0- 10	10- 20	20- 30	30- 40	40- 50	50- 60
No. of students	4	10	16	22	20	18

Represent this data in the form of a histogram.

SECTION D

Q.31. On a particular day the sales (in rupees) of different items of a Baker's shop are given below:

Ordinary bread	Fruit bread	Cakes	Biscuits	Others
320	80	40	120	160

Draw a pie chart (Show all the calculations)

Q.32. An army general wishes to arrange his 10406 men in the form of a square. On doing so he found that 2 men were left. How many men were there in each row?

Q.33. (i) If $y-\frac{1}{y}=9$, find $y^2+\frac{1}{y^2}$.

(ii)Show that $(9a-5b)^2 + 180\,ab = (9a+5b)^2$.

Q.34. ABCD is a parallelogram in which $\angle DAO = 40^\circ$, $\angle BAO = 35^\circ$ and $\angle COD = 75^\circ$.

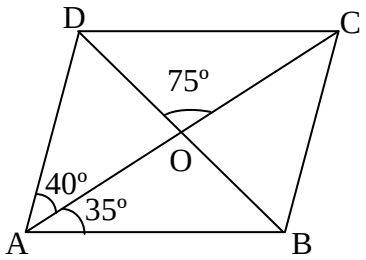
Find

(i) $\angle ACB$

(ii) $\angle ODC$

(iii) $\angle ABO$

(iv) $\angle ABC$



Q.35. Solve for x:

$$5x-2(2x-7)=2(3x-1)+\frac{7}{2}$$

==========

MODEL TEST PAPER SUMMATIVE ASSESSMENT-I
(*Unsolved- 3*)

Time: 3hr. **Max Marks: 80**

GENERAL INSTRUCTIONS.

- Attempt all the questions neatly, showing the necessary working wherever required.
- Section-A (Q1- Q10): Each question carries 1 mark.
- Section-B (Q11- Q20): Each question carries 2 marks.
- Section-C (Q 21-Q 30): Each question carries 3 marks.
- Section-D (Q31- Q 35): Each question carries 4 marks.

==========

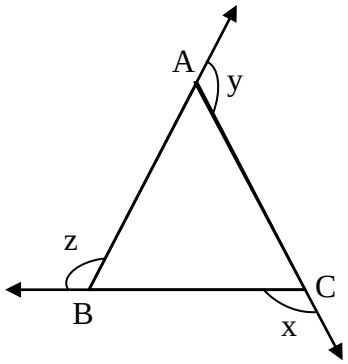
SECTION A

Q.1. The product of $\frac{5}{7}$ and the additive inverse of $\frac{21}{15}$ is _____.

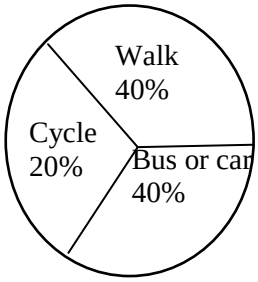
Q.2. How many natural numbers lie between squares of 30 and 31?

Q.3. The value of $\sqrt[3]{\frac{-125}{64}}$ is _____.

Q.4. Find the value of x + y + z in the figure below:



Q.5. In the given pie chart find the fraction of the circle representing cycle as mode to transport.



Q.6. Three angles of a quadrilateral are 80º each so the fourth angle will be _____.

Q.7. If $x = -2$ then, find the value of $x^2 - 3x$ is _____.

Q.8. The class mark of class interval 60- 70 is _____.

Q.9. If $2(x - 3) = -5$ then $x =$ _____.

Q.10. Simplify $(x + 5)(x - 5)$.

SECTION B

Q.11. By what number should we multiply $\frac{-5}{7}$ to get $\frac{-10}{13}$.

Q.12. Evaluate: $\left\{\sqrt{3^2 + 4^2}\right\}^3$

Q.13. Find x if $5x = 25^2 - 20^2$.

Q.14. A number multiplied by itself gives 729. Find the number.

Q.15. PQRS is a trapezium in which PQ||RS. If $\angle P = \angle Q = 50^\circ$, then what is the measure of other two angles?

Q.16. Simplify: $20a^2 + 6a - 3a(a - 4)$

Q.17. Following frequency distribution table shows marks (out of 50) obtained in Math test by 45 students of class VIII.

Class Interval	Frequencies
0- 10	1
10- 20	6
20- 30	12
30- 40	20
40- 50	6
Total	45

(i) What is the size of the class interval?

(ii) Which class has the highest frequency?

Q.18. Solve for a: $5a + 9 = 2(7a - 9)$

Q.19. By what least number should we multiply 810 to make it a perfect square?

Q.20. The exterior angle of a regular polygon is 36°. Find the number of sides of the polygon.

SECTION C

Q.21. Solve for x : $\frac{x}{3}-\frac{1}{5}=\frac{x}{5}+\frac{1}{4}$

Q.22. Find the smallest number of four digits which is a perfect square.

Q.34. Find the value of $(x^2 + 2y)(x - y)$ when $x = 1$ and $y = -2$.

Q.23. Find six rational numbers between $\frac{-17}{6}$ and $\frac{-5}{3}$?

Q.24. Solve: $\frac{2x+1}{3x-2}=\frac{9}{10}$

Q.25. The volume of a cubical box is 32.768 cubic metre. Find the length of a side of the box.

Q.26. The following table gives the marks scored students in an entrance examination.

Marks	1- 10	10- 20	20- 30	30- 40	40- 50	50- 60
No. of students	4	10	16	22	20	18

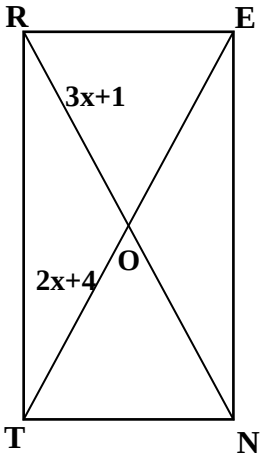
Represent this data in the form of a histogram.

Q.27. The ratio between the exterior angle and the interior angle of a regular polygon is 2 : 7. Find the number of sides in the polygon.

Q.28. Simplify using property and also state the property: $\left\{\frac{7}{5}\times\left(\frac{-1}{4}\right)\right\}+\left\{\frac{7}{5}\times\frac{5}{12}\right\}$

Q.29. RENT is a rectangle with its dimensions in metres. Its diagonals meet at O.
If OR= 3x + 1, OT= 2x + 4. Find

(i) x
(ii) RN
(iii) TE



SECTION D

Q.36. Solve for x:

$$5x - 2(2x - 7) = 2(3x - 1) + \frac{7}{2}$$

Q.32. ABCD is a parallelogram in which ∠DAO = 40°, ∠BAO= 35° and ∠COD= 65°.

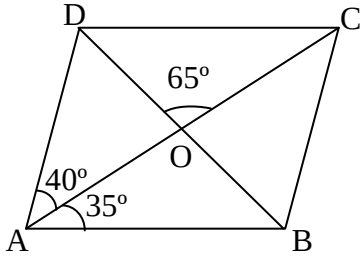
Find

(i) ∠ABO

(ii) ∠ODC

(iii) ∠ACB

(iv) ∠ABC



Q.33. (i) If $x + \frac{1}{x} = 9$, find $x^2 + \frac{1}{x^2}$.

(ii)Show that = $(9a + 5b)^2 = (9a - 5b)^2 + 180\ ab$.

Q.34. An army general wishes to arrange his 10406 men in the form of a square. On doing so he found that 2 men were left. How many men were there in each row?

Q.35. On a particular day the sales (in rupees) of different items of a Baker's shop are given below:

Ordinary bread	Fruit bread	Cakes	Biscuits	Others
320	80	40	120	160

Draw a pie chart (Show all the calculations)

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MODEL TEST PAPER SUMMATIVE ASSESSMENT-II
(Solved)

Time : 2 hrs 30 min. **Maximum Marks : 80**

General Instruction –

- Read the question paper well before answering.
  1. Section A Q.1. to Q.10. carry 1 mark each.
  2. Section B Q.11. to Q.20. carry 2 marks each.
  3. Section C Q.21. to Q.30. carry 3 marks each.
  4. Section D Q.31. to Q.35. carry 4 marks each.

==========

SECTION-A

Choose the correct answer:

Q.1. One of the factors of $25x^2–0.01y^2$ is:

(i) $5x–y$ *(iii)* $5x–0.01y$
(ii) $5x+y$ *(iv)* $5x+0.1y$

Q.2. What will be the amount of discount if an article marked at Rs 460 is sold at a discount of 15%.

(i) Rs 89 *(iii)* Rs 83
(ii) Rs 79 *(iv)* Rs 69

Q.3. **The compound interest on Rs 4000 lent for 2 years at 5% per annum when the compound interest is payable annually is :**

(i) Rs 390 *(iii)* Rs 450
(ii) Rs 410 *(iv)* Rs 480

Q.4. The area of a trapezium with parallel sides 10 cm and 6 cm and height 5 cm is :

(i) 10 sq cm *(iii)* 40 sq cm
(ii) 20 sq cm *(iv)* 80 sq cm

Q.5. The standard form for 0.000035 is :

(i) $3.5x10^{-5}$ *(iii)* $3.5x10^{-6}$
(ii) $3.5x10^{5}$ *(iv)* $3.5x10^{6}$

Q.6. x and y vary directly with each other. When x is 12, y is 18. Which of the following is not a possible pair of corresponding values of x and y?

(i) 2, 3
(ii) 8, 12
(iii) 15, 20
(iv) 25, 37.5

Q.7. A point whose x-coordinate is zero and y-coordinate is non-zero will lie on the:

(i) x-axis
(ii) origin
(iii) y-axis
(iv) None of these

Q.8. Which is the next number in the series :

4, 9, 25, 49, 121, ……

(i) 129
(ii) 169
(iii) 137
(iv) 203

Q.9. Value of x in $6x = 29^2 - 23^2$ is

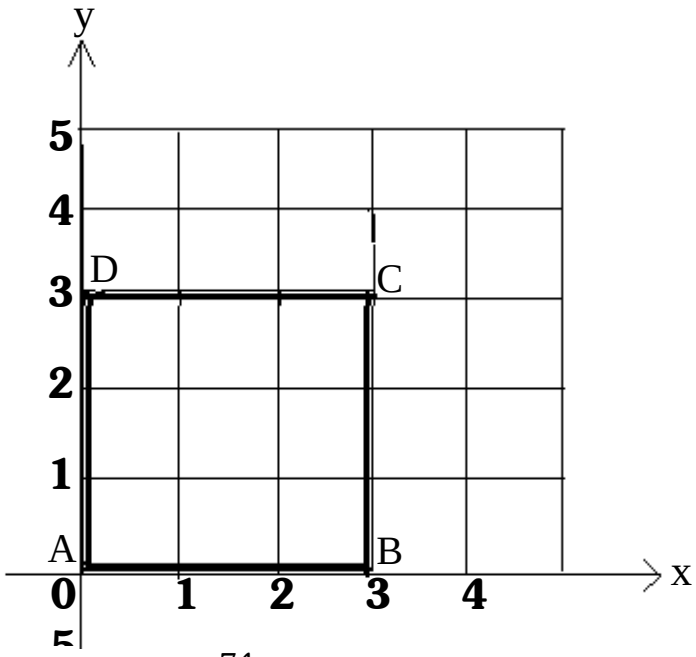
(i) 52
(ii) 104
(iii) 48
(iv) None of these

Q.10. The value of $(2^{-1} - 3^{-1})^{-1}$ is

(i) 1/6
(ii) –6
(iii) 6
(iv) None of these

SECTION-B

Q.11. Write the coordinates of the vertices of the adjoining figure ABCD shown.



Q.12. If 153a65 is a multiple of 9 where 'a' is a digit, what is the value of 'a'?

Q.13. Solve and write the answer as a positive exponent:

$$\left(\frac{1}{6}\right)^{-2} \times 6^{-4}$$

Q.14. Geeta types 620 words in one hour. How many words would she type in 6 minutes?

Q.15.

$$\begin{array}{r} A\ \ 1 \\ +\ 1\ \ B \\ \hline B\ \ 0 \end{array}$$

Find the values of the letters A and B.

Q.16. The area of a rhombus is 192 sq m. If one of its diagonal is 16 m, find the length of the other diagonal.

Q.17. Solve:

$$(4^{-1} + 8^{-1}) \div \left(\frac{2}{3}\right)^{-1}$$

Q.18. The C.P. of a sofa set is Rs 5,500 included 10% VAT. Find the price before VAT was added.

Q.19. Regroup the following terms and factorise:
10mn + 4m + 5n + 2

Q.20. A shopkeeper offers 4% discount on calculator to his customers. What does a customer pay for a calculator whose marked price is Rs 650?

SECTION-C

Q.21. Plot the following points on the graph paper-

(i) (6, 0)
(ii) (0, 5)

Name the axis on which the two points lie.

Q.22. The area of a rectangle is $5a^2 + 25a$. If its breadth is 25a, then find its length.

Q.23. Find the compound interest on Rs 20,000 for an year at 10% per annum compounded half yearly.

Q.24. A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is C.P. of an article marked Rs 280?

Q.25. By what number should $\left(\frac{-3}{2}\right)^{-3}$ be divided so that the quotient is $\left(\frac{9}{4}\right)^{-2}$?

Q.26. The area of four walls of a room is 57.4m^2. If the room is 5m long and 3.2m wide, find the height of the room.

Q.27. Solve and find the value of x:
$16^{3x} = 32^{(5x-13)}$

Q.28. The cost of 7y metres of cloth is Rs ($14y^2 + 21y^3$). Find the cost of 1m cloth.

Q.29. Veena can buy 25 books worth Rs. 500 each. How many books will she be able to buy for the same amount if each book costs Rs. 125 more?

Q.30. The area of a rectangular field is 836 sq.m. Breadth of the field is 22 m. What is the perimeter of the field?

SECTION-D

Q.31. In a section of Tihar jail there were 800 prisoners at one time and food for them was sufficient for 15 days. Then some prisoners were transferred to an adjoining section and the food lasted for 25 days. How many prisoners were transferred?

Q.32.The following table shows the number of articles and their cost in rupees:

No. of articles	**2**	**4**	**6**	**8**	**10**
Cost price (in Rs)	**150**	**300**	**450**	**600**	**750**

(i) Represent the above table by a graph.
(ii) From the graph answer the following questions.
(a) What will be the cost of 7 articles.
(b) How many articles can be purchased for Rs 375?

Q.33.Factorise:
(i) $x^2 - 8x - 65$
(ii) $x^4 - (y + z)^4$

Q.34. 15 cylindrical pillars of a building are to be painted and the diameter and height of each pillar is 48cm and 7m respectively. Find the cost of painting if the rate is Rs. 2 per sq.m.

Q.35. A rectangular sheet of paper 11cm × 10cm is rolled along its length and a cylinder is formed. Find the volume of the cylinder so obtained.

==========

SOLUTIONS

Time : 3 hrs **Max Marks : 80**

Q.1. (iv)
Q.2. (iv)
Q.3. (ii)
Q.4. (iii)
Q.5. (i)
Q.6. (iii)
Q.7. (iii)
Q.8. (iii)
Q.9. (i)
Q.10 (iii)

Q.11. A(0,0), B(3,0), C(3,3), D(0,3)

Q.12. The value of a is 7.

Q.13. $\left(\frac{1}{6}\right)^{-2} \times 6^{-4}$

$= 6^2 \times 6^{-4} \left[a^{-m} = \frac{1}{a^m} \right]$

$= 6^{2+(-4)} \left[a^m \times a^n = a^{m+n} \right]$

$= 6^{-2} \left[a^{-m} = \frac{1}{a^m} \right]$

Q.14.

Time (min)	60	6
Words typed	620	x

$\frac{x}{y} = k(direct\ variation)$

$\frac{60}{6} = \frac{620}{x}$

$60x = 620 \times 6$

$x = \frac{620 \times 6}{60} = 62$

In 6 minutes 62 words are typed.

Q.15. The value of A=7, B=9.

Q.16. Diagonal of a rhombus= 16m

Area of the rhombus = $192\,m^2$

$$\frac{1}{2}\times d_1 \times d_2 = 192$$

$$\frac{1}{2}\times 16 \times d_2 = 192$$

$$8d_2 = 192$$

$$d_2 = \frac{192}{8} = 24$$

The other diagonal of rhombus=24m.

Q.17. $\left(4^{-1}+8^{-1}\right)\div\left(\frac{2}{3}\right)^{-1}$

$$\left(\frac{1}{4}+\frac{1}{8}\right)\div\left(\frac{3}{2}\right)$$

$$\left(\frac{2+1}{8}\right)\div\frac{3}{2}$$

$$\frac{3}{8}\div\frac{3}{2}$$

$$\frac{3}{8}\times\frac{2}{3}=\frac{1}{4}$$

Q.18 Let the price of sofa set before VAT was added } =Rs

A.T.Q,

x + 10% of x =Rs 5500

$$\frac{10x}{100} = 5500$$

$$\text{x} + \frac{10x + x}{10} = 5500$$

$$\frac{11x}{10} = 5500$$

$$x = \frac{5500\times 10}{11} = 5000$$

Price of sofa set before VAT added= Rs 5000

Q.19 10 mn + 4m + 5n +2

2m (5n+2) + (5n + 2)

(5n + 2) (2m +1)

Q.20 M.P. of calculator = Rs 650

Discount = 4% of Rs 650

$$= \frac{4}{100} \times 650 = Rs26$$

Money customer pays = Rs 650 – Rs 26

= Rs 624

Q.21 x coordinate = 3
y coordinate = 5
Point A lies on x-axis
Point B lies on y-axis

Q.22 Breadth of rectangle = 25 a

Area of rectangle $= 5a^2 + 25a$

$l \times b = 5a^2 + 25a$

$25a \times l = 5a^2 + 25a$

$$l = \frac{5a^2 + 25a}{25a}$$

$$l = \frac{5a\ (a + 5)}{25a}$$

The length of rectangle $= \frac{a+5}{5}$

Q.23.

$$P\left(1+\frac{R}{200}\right)^{2n}$$

$$A = 20000\left(1+\frac{10}{200}\right)^{2}$$

$$A = 20000\times\frac{21}{20}\times\frac{21}{20}$$

$$A = Rs22050$$

$$C.I = A - P$$

$$= Rs22050 - Rs20000$$

$$C.I = Rs2050$$

Q.24. M.P. of an article = Rs 280

Discount = 10% of Rs 280

$$= \frac{10}{100}\times 280 = Rs28$$

Selling Price = M.P – Discount

= Rs 280 – 28= Rs 252

Profit % = 26

$$C.P = \frac{S.P\times 100}{100+\Pr ofit\%}$$

$$= = \frac{252\times 100}{100+26}$$

$$= \frac{252\times 100}{126}$$

C.P of article =Rs 200

Q.25. Let the number to be divided = x

A.T.Q

$$\left(\frac{-3}{2}\right)^{-3} \div x = \left(\frac{9}{4}\right)^{-2}$$

$$\left(\frac{2}{-3}\right)^{3} \div x = \left(\frac{4}{9}\right)^{2}$$

$$\frac{8}{-27} \div x = \frac{16}{81}$$

$$\frac{8}{-27x} = \frac{16}{81}$$

$$x = \frac{8 \times 81}{-27 \times 16}$$

$$= \frac{-3}{2}$$

The number to be divided = $\frac{-3}{2}$

Q.26. Area of four walls= 57.4 m^2

Length of the room= 5 m

Width of the room= 3.2 m

$$A = 57.4$$

$$2 \times h\ (l+b) = 57.4$$

$$2 \times h\ (5+3.2) = 57.4$$

$$2 \times h \times 8.2 = 57.4$$

$$16.4\ h = 57.4$$

$$h = \frac{57.4}{16.4} = \frac{574}{164} = 3.5$$

Height of the room = 3.5 m

Q.27.

$$16^{3x} = 32^{5x-13}$$
$$(2^4)^{3x} = (2^5)^{5x-13}$$
$$2^{12x} = 2^{5(5x-13)}$$
$$2^{12x} = 2^{25x-65}$$
$$12x = 25x - 65$$
$$25x - 12x = 65$$
$$13x = 65$$
$$x = 5$$

Q.28. Cost of 7y m cloth= $14y^2 + 21\ y^3$

Cost of 1 m cloth= $14y^2 + 21\ y^3 \div 7y$

$$= \frac{7y^2(2+3y)}{7y} = y(2+3y)$$

Cost of 1 m cloth = $y(2+3y)$

Q.29. Let the number of books that can be purchased amount be as x

Books	25	x
Cost (in Rs)	Rs 500	Rs 625

$x \times y = k$ (inverse variation)

$25 \times 500 = x \times 625$

$x = \frac{500 \times 25}{625} = 20$

Number of books that can be bought for Rs 625=20

Q.30. Area of a rectangular field = 836 m^2

Breadth of field = 22 m

Length of field = $\frac{\text{Area}}{\text{Breadth}}$

$$= \frac{836}{22}$$

$$l = 38$$

Perimeter of field $= 2 \times (l + b)$

$= 2 \times (38+22) = 2 \times 60 = 120$ m

Q.31. Let the number of prisoners be x

Number of prisoners	Number of days
800	15
x	25

$x \times y = k$ (inverse variation)

$800 \times 15 = x \times 25$

$$x = \frac{800 \times 15}{25}$$

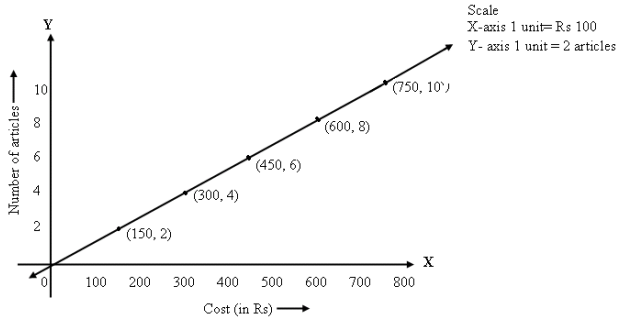
$= 480$

If x is the number of prisoners left then number of prisoners transferred } $800 - 480 = 320$

Q.32. (ii) (a) Cost of 7 articles = Rs 525

(b) Number of articles that can be purchased for Rs 375 = 5

(i) Graph



Q.33. (i) $x^2 - 8x - 65$

$x^2 + (5 - 13)\, x - 65$

$x^2 + 5x - 13x - 65$

$x\,(x + 5) - 13\,(x + 5)$

$(x - 13)(x + 5)$

(ii) $x^4 - (y + z)^4$

$$\left(x^2\right)^2 - \left[\left(y+z\right)^2\right]^2$$

$$\left[x^2 + (y+z)^2\right]\left[x^2 - (y+z)^2\right]$$

$$\left[x^2 + (y+z)^2\right]\left[(x)^2 - (y+z)^2\right]$$

$$\left[x^2 + (y+z)^2\right]\left[x + (y+z)(x - (y+z)\right]$$

$$\left[x^2 + (y+z)^2\right]\left[(x+y+z)(x-y-z)\right]$$

Q.34. Diameter of a pillar = 48 cm

Radius of pillar = 24 cm = 0.24 m

Height of a pillar = 7 m

Curved surface area of a pillar = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 0.24 \times 7$$

$$= 10.56 \text{ m}^2$$

Curved surface area of 15 pillars = 10.56×15

Cost of painting 15 pillars $= 10.56 \times 15 \times 2$

$$= \text{Rs } 316.80$$

Q.35. Length of the paper becomes the perimeter of the base of the cylinder and the width becomes height.

Let the radius of the cylinder = r

Height of the cylinder = h

Perimeter of the base of the cylinder = $2\pi r$

$$2\pi r = 11$$

$$2 \times \frac{22}{7} \times r = 11$$

$$r = \frac{7}{4} cm$$

Volume of the cylinder $= \pi r^2 h$

$$\frac{22}{7} \times \frac{7}{4} \times \frac{7}{4} \times 4$$

$$= 38.5 cm^3$$

Hence, volume of the cylinder $= 38.5 cm^3$

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MODEL TEST PAPER SUMMATIVE ASSESSMENT-II
Unsolved-1

Time : 2 hrs 30 min. **Maximum Marks : 80**

General Instructions:

- Read the question paper well before answering.
  1. Section A Q.1. to Q.10. carry 1 mark each.
  2. Section B Q.11. to Q.20. carry 2 marks each.
  3. Section C Q.21. to Q.30. carry 3 marks each.
  4. Section D Q.31. to Q.35. carry 4 marks each.

SECTION- A

Choose the correct answer:

Q.1. One of the factors of $36a^2-0.01b^2$ is:

(i) 6a–b
(ii) 6a+b
(iii) 6a–0.01b
(iv) 6a+0.1b

Q.2. What will be the amount of discount if an article marked at Rs 250 is sold at a discount of 12%?

(i) Rs 203
(ii) Rs 225
(iii) Rs 218
(iv) Rs 220

Q.3. Given: 1 A

× A

7 A

The value of alphabet A is

(i) 6
(ii) 1
(iii) 5
(iv) None of these

Q.4. The compound interest on Rs 2000 lent for 2 years at 5% per annum when the compound interest is payable annually is:

(i) Rs 210
(ii) Rs 230
(iii) Rs 205
(iv) Rs 250

Q.5. The area of a trapezium with parallel sides 6 cm and 4 cm and height 5 cm is:

(i) 20 sq cm
(ii) 28 sq cm
(iii) 25 sq cm
(iv) 35 sq cm

Q.6. The standard form for 0.0000072 is:

(i) 7.2×10^{-6} *(iii)* 7.2×10^{-7}

(ii) 7.2×10^{6} *(iv)* 7.2×10^{7}

Q.7. x and y vary directly with each other. When x is 10, y is 15 which of the following is not a possible pair of corresponding values of x and y?

(i) (2, 3) *(iii)* (15, 20)

(ii) (8, 12) *(iv)* (25, 37.5)

Q.8. A point whose y-coordinate is zero and x-coordinate is non-zero will lie on the:

(i) x-axis *(iii)* y-axis

(ii) origin *(iv)* None of these

Q.9. Which is the next number in the series?

4, 16, 36, 64, ...

(i) 81 *(iii)* 121

(ii) 100 *(iv)* None of these

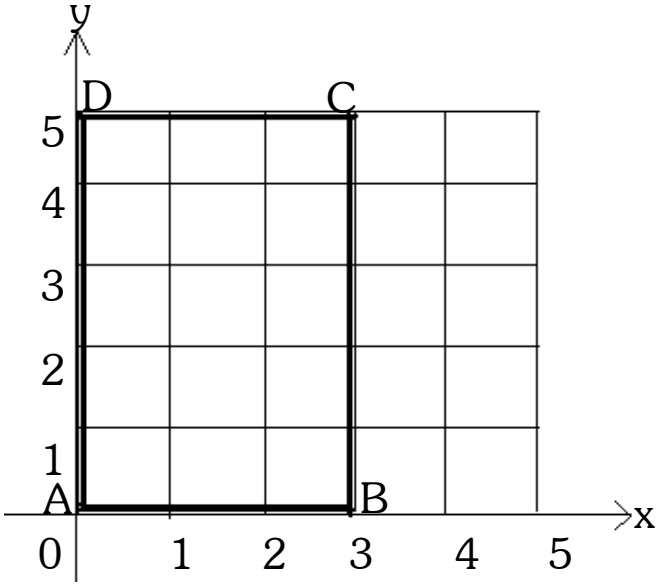
Q.10. The value of $\frac{96 \times 96 - 4 \times 4}{92}$ **is**

(i) 1000 *(iii)* 1

(ii) 100 *(iv)* None of these

SECTION- B

Q11. Write the coordinates of the vertices of the adjoining figure ABCD shown.



Q12. If 2857c6 is a multiple of 9 where 'c' is a digit, what is the value of 'c'?

Q13.

$$\begin{array}{r} A\ 1 \\ +\ 1\ B \\ \hline B\ 0 \end{array}$$

Find the values of the letters A and B.

Q14. Sunita types 550 words in one hour. How many words would she type in 6 minutes?

Q15. Solve and write the answer as a positive exponent:

$$\left(\frac{1}{6}\right)^{-2} \times 6^{-4}$$

Q16. The area of a rhombus is 161 sq m. If one of its diagonal is 4 m, find the length of the other diagonal.

Q17. Solve:

$$(4^{-1} + 8^{-1}) \div \left(\frac{2}{3}\right)$$

Q18. Regroup the following terms and factorise:
$2xy + 6x + y + 3$

Q19. The C.P. of a sofaset is Rs 5,500 included 10% VAT. Find the price before VAT was added.

Q20 Plot the following points on the graph paper-

(i) (0, 4) *(ii)* (3, 0)

Name the axis on which the two points lie.

SECTION- C

Q21. A shopkeeper offers 4% discount on calculator to his customers. What does a customer pay for a calculator whose marked price is Rs 650?

Q22. The area of a rectangle is $4y^2 + 24y$. If its breadth is 24y, then find its length.

Q23. Find the compound interest on Rs 10,000 for an year at 10% per annum compounded half yearly.

Q24. The area of four walls of a room is 57.4m^2. If the room is 5 m long and 3.2 m wide, find the height of the room.

Q25. The cost of 25a metres of cloth is Rs (5a^2 + 25a). Find the cost of 1m cloth.

Q26. Solve and find the value of x:

$$8^{3x} = 16^{(3x-6)}$$

Q27. A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is C.P. of an article marked Rs 280?

Q28. By what number should $\left(\frac{-5}{2}\right)^{-3}$ be divided so that the quotient is $\left(\frac{25}{4}\right)^{-2}$?

Q29. The area of a rectangular field is 408sq.m. Breadth of the field is 12 m. What is the perimeter of the field?

Q30.Veena can buy 25 books worth Rs. 500 each. How many books will she be able to buy for the same amount if each look costs Rs. 125 more?

SECTION- D

Q31.The following table shows the number of articles and their cost in rupees:

No. of articles	**2**	**4**	**6**	**8**	**10**
Cost price (in Rs)	**150**	**300**	**450**	**600**	**750**

(iii) Represent the above table by a graph.

(iv) From the graph answer the following questions.

(a) What will be the cost of 7 articles.

(b) How many articles can be purchased for Rs 375?

Q32.Factorise:

(iii) $x^2 - 8x - 65$

(iv) $x^4 - (y + z)^4$

Q33. Rohit lends Rs 1000 at 10½% per annum compound interest payable annually. Rishabh lends the same sum at 10% per annum compound interest, but payable half yearly. Who is gaining more C.I. at the end of one year and by how much?

Q34. In a section of Tihar jail there were 800 prisoners at one time and food for them was sufficient for 15 days. Then some prisoners were transferred to

an adjoining section and the food lasted for 25 days. How many prisoners were transferred?

Q35. 15 cylindrical pillars of a building are to be painted and the diameter and height of each pillar is 48cm and 7m respectively. Find the cost of painting if the rate is Rs. 2 per sq.m.

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MODEL TEST PAPER SUMMATIVE ASSESSMENT-II
Unsolved-2

Time : 2 hrs 30 min. **Maximum Marks : 80**

GENERAL INSTRUCTIONS.

- Attempt all the questions neatly.
- Section- A: Q 1- Q 10 carry 1 mark each.
- Section- B: Q 11- Q 20 carries 2 marks each.
- Section- C: Q21-Q 30 carries 3 marks each.
- Section- D: Q31- Q 35 carries 4 marks each.

==========

SECTION A

Q.1. A cuboid is of dimension 16 cm × 10 cm × 0.2 m, its volume is _____ cm^3.

Q.2. If x and y vary inversely which of the following is true .

$x_1y_1 = x_2y_2$ Or $x_1 x_2 = y_1y_2$

Q.3. The buying price of a towel, when 10% sales tax added on the purchase of Rs 50 is Rs _____.

Q.4. What is the rate when simple interest on Rs 1600 is Rs 576 after 3 years? Rs _____

Q.5. The value of $(16^5 \div 16^3)^\circ = 1$. State True or False.

Q.6. The usual form of the number 3.02×10^{-4} is _____.

Q.7. Which one is the factor of $x^2 + 2x + 1$? Choose the correct option

$(x + 1)$ or $(x + 2)$

Q.8. HCF of $15a^2b^2$, $-20a^3b$ and $10ab^2$ is _____.

Q.9. Point (5, 0) lies on _____ axis.

Q.10. How many axes does the Cartesian system have? (Two/ Four)

SECTION B

Q.11. Find the area of a rhombus whose diagonals are of lengths 10 cm and 8.2 cm.

Q.12. If 50 metres of a cloth costs Rs 3725, how much cloth can be purchased for Rs 1788?

Q.13. Sohan bought a second hand refrigerator for Rs 3000 and sold it for Rs 3300. Find his loss or gain percent.

Q.14. If 8% VAT is included in the price, find the original price of a TV which was bought for Rs 13,500.

Q.15. Simplify and write the answer in exponential form:

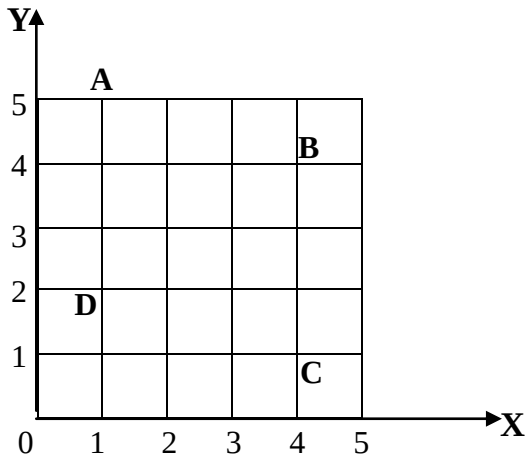
$(2^5 \div 2^8)^5 \times 2^{-5}$

Q.16. Factorise: 15pq + 15 + 9q + 25p

Q.17. Find the value of $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$

Q.18. Find the side of a cube whose surface area is 600 cm^2.

Q.19. Write the coordinate of the vertices of the quadrilateral ABCD :



Q.20. The following graph shows the temperature of a patient in a hospital, recorded every hour.

(i) What was the patient's temperature at 2 p.m.?

(ii) When was the patient temperature 37.5°C?

SECTION C

Q.21. A rectangular paper with dimensions 11 cm × 4 cm is rolled without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder.

Q.22. 6 pipes are required to fill a tank in 1 hour 20 minutes. How long will it take if only 5 pipes of the same type are used?

Q.23. A vendor purchased eggs at Rs 16 per dozen and sold them at 10 for Rs 18. Find his gain or loss percent?

Q.24. Find the amount and compound interest on Rs 10000 for 1½ year at 10% per annum, compound half yearly.

Q.25. Find the value of x:

$$\left(\frac{2}{9}\right)^{3} \times \left(\frac{2}{9}\right)^{-6} = \left(\frac{2}{9}\right)^{2x-1}$$

Q.26. By what number should $\left(\frac{-3}{2}\right)^{-3}$ be multiplied so that product is $\left(\frac{9}{4}\right)^{-2}$

Q.27. Solve:

$$\frac{6y+1}{3} + 1 = \frac{y-3}{6}$$

Q.28. Divide:

$44\ (x^4 - 5x^3 - 24x^2)$ by $11x\ (x - 8)$

Q.29. Factorise:

$4b^2 - 28bc + 49c^2 - 25a^2$

Q.30. Solve:

$15\ (y - 4) - 2(y - 9) + 5(y + 6) = 0$

SECTION D

Q.31. In a building there are 24 cylindrical pillars. The radius of each pillar is 2.8 m and height is 5 m. Find the total cost of painting the curved area of all the pillars at the rate of Rs 8 per m^2.

Q.32. (a) Draw a graph for the following data:

No. of years	1	2	3	4	5
Simple interest (In Rs)	60	120	180	240	300

(b) The graph obtained is linear. State true or false

Q.33. Factorise using appropriate identity:

(i) $63a^2 - 112b^2$

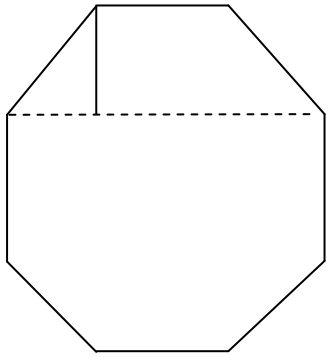
(ii) $q^2 - 10q + 21$

Q.34. A train is moving at a uniform speed of 75 km/ hr.

(a) How far will it travel in 20 minutes?

(b) Find the time required to cover a distance of 250 km.

Q.35. Top surface a raised platform is in the shape of a regular octagon with dimensions given in the figure. Find the area of the octagonal surface.



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MODEL TEST PAPER SUMMATIVE ASSESSMENT-II
Unsolved-3

Time : 2 hrs 30 min. **Maximum Marks : 80**

GENERAL INSTRUCTIONS.

- Attempt all the questions.
- Section- A: Q 1- Q 10 carry 1 mark each.
- Section- B: Q 11- Q 20 carries 2 marks each.
- Section- C: Q21-Q 30 carries 3 marks each.
- Section- D: Q31- Q 35 carries 4 marks each.

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SECTION A

Q.1. The cost of a soap is Rs 35 and VAT on it is 10% .The bill amounts to Rs _____.

Q.2. If x and y vary directly, which of the following is true.

(If x decreases, y also decreases or If x increases y decreases)

Q.3. If dimension of cuboid is 12 cm × 8 cm × 4 m, its volume is _____ cm^3.

Q.4. The value of $(5^3 \div 3^5)^\circ = 1$. State True or False.

Q.5. Standard form of 0.000056 is _____.

Q.6. Which one is the factor of $x^2 - 9$? Choose the correct option [(x + 9) or (x + 3)].

Q.7. Point (0, 4) lies on _____ axis.

Q.8. The coordinates of the origin are _____.

Q.9. Common factor of 6abc, $24ab^2$ and $12a^2b$ is _____.

Q.10. If Compound Interest charged on Rs 10,000 is Rs 1080.56 then amount is _____.

SECTION B

Q.11. A machine produces 180 tools in 6 hrs. How many tools will it produce in 9 hours.

Q.12. Varun purchased a calculator for Rs 2500 and sold it to his friend for Rs 2800. Find his gain percent.

Q.13. Neena bought a Television for Rs 2375 after getting 5% discount on it. What is its list price?

Q.14. Simplify and write the answer in exponential form:

$(5^3 \div 5^6)^5 \times 5^{-5}$

Q.15. Factorise:

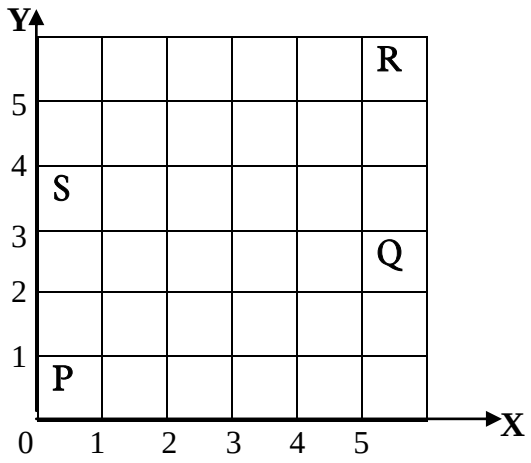
$15xy - 6x + 10y - 4$

Q.16. Find the value of $\left(\frac{1}{2}\right)^{-1} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-3}$

Q.17. The area of a rhombus is $48cm^2$. One of its diagonal measures 8cm. What is the length of the other diagonal?

Q.18. The dimensions of a room are 6m× 5m× 3m. Find the surface area of its walls.

Q.19. Write the coordinates of the vertices of the quadrilateral PQRS.



Q.20. The following graph shows the temperature of a patient in a hospital recorded every hour.

(i) When was the patient's temperature 36°C?

(ii) What was the patient's temperature at 10:30 a.m.?

SECTION C

Q.21. Solve:

$15(y - 4) - 2(y - 9) + 5(y + 6) = 0$

Q.22. A rectangular paper width dimensions 22 cm × 6 cm is rolled without overlapping to make a cylinder of height 6 cm. Find the volume of the cylinder.

Q.23. Find the value of y:

$$\left(\frac{4}{7}\right)^{3} \times \left(\frac{4}{7}\right)^{-6} = \left(\frac{4}{7}\right)^{2y-1}$$

Q.24. 6 pipes are required to fill a tank in 1 hour 20 minutes. How long will it take if only 5 pipes of the same type are used?

Q.25. By what number should $\left(\frac{-5}{2}\right)^{-3}$ be multiplied so that the product is $\left(\frac{25}{4}\right)^{-2}$?

Q.26. Divide:

$4yz\,(z^2 + 6z - 16)$ by $2y\,(z + 8)$

Q.27. Factorise:

$9a^2 - 30bc + 25b^2 - 36c^2$

Q.28. Solve: $\frac{6x+1}{3} + 1 = \frac{x-3}{6}$

Q.29. Find the amount and compound interest on Rs 10000 for 1½ year at 10% per annum, compounded half yearly.

Q.30. A vendor purchased eggs at Rs 16 per dozen and sold them at 10 for Rs 18. Find his gain or loss percent?

SECTION D

Q.31. (a) Draw a graph for the following:

Side of square (in cm)	1	2	3	4	5
Area (in cm^2)	1	4	9	16	25

(b) The graph obtained is linear. State true or false.

Q.32. A train is moving at a uniform speed of 75 km/ hr.

(a) Find the time required to cover a distance of 250 km.

(b) How far will it travel in 20 minutes?

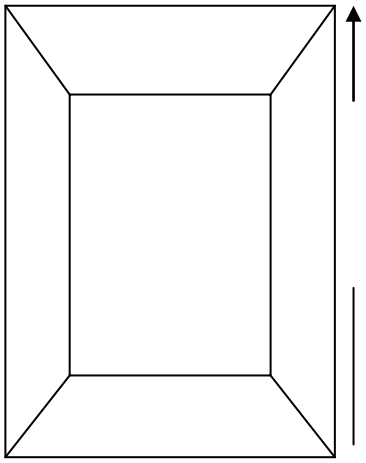
Q.33. Factorise using appropriate identity:

(i) $a^2 - 10a + 21$

(ii) $32x^2 - 98y^2$

Q.34. In a building there are 16 cylindrical pillars. The radius of each pillar is 2.8 m and height is 6 m. Find the total cost of painting the curved area of all pillars at the rate of Rs 7 per m^2.

Q.35. A picture frame has outer dimensions 24 cm × 28 cm and inner dimensions 16 cm × 20 cm. Find the area of each section of the frame, if the width of each section is same.



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WORKSHEETS

Rational Numbers

LEVEL-1

Q.1. Ruchi bought $2\frac{1}{2}$kg potatoes at Rs. 10/kg and $1\frac{3}{8}$kg tomatoes at Rs. $16\frac{8}{11}$per kg. How much money did she give to the shopkeeper for 1 kg of potatoes and 1 kg of tomatoes? [Ans: Rs. 48]

Q.2. If $12\frac{1}{4}$m cloth costs Rs $212\frac{1}{3}$. Find the cost of 1m cloth. [Ans: Rs$17\frac{1}{3}$]

Q.3. Insert 5 rational numbers between $-\frac{2}{5}$ and $\frac{1}{3}$.

Q.4. A man has Rs. 100 with him. He bought $3\frac{1}{2}$liters of milk at Rs.$16\frac{1}{2}$per liter. How much money is left with him? [Ans: Rs. $42\frac{1}{4}$]

Q.5. Simplify: $\left(-\frac{3}{5}\right)\times\left(\frac{-10}{9}\right)\times\left(\frac{21}{-4}\right)\times(-6)$ [Ans: 21]

Q.6. Write additive inverse of:

(i) $\frac{-10}{31}$ *(ii)* $\frac{4}{-15}$ [Ans: (i) $\frac{10}{31}$ (ii) $\frac{4}{15}$]

Q.7. Subtract $\frac{-4}{9}$ from $\frac{-1}{12}$. [Ans: $\frac{13}{36}$]

Q.8. Verify by taking $x=\frac{-3}{4}$ $y=\frac{2}{3}$ $z=\frac{-5}{6}$

$x \times (y+z) = x \times y + x \times z$

Q.9. What should be subtracted from $\frac{-8}{7}$ to get $\frac{-3}{14}$? [Ans: $\frac{-13}{14}$]

LEVEL-2

Q.1. Simplify:

$$\left(-\frac{3}{2}\times\frac{4}{5}\right)+\left(\frac{9}{5}\times\frac{-10}{3}\right)-\left(\frac{1}{2}\times\frac{3}{4}\right)$$ [Ans: $\frac{-303}{40}$]

Square & Square Roots

LEVEL-1

Q.1. Without actual finding the squares of the numbers find the value of:

(i) $(21)^2 - (20)^2$

(ii) $(132)^2 - (131)^2$ [Ans: *(i)* 41, *(ii)* 263]

Q.2. By what least number should we divide 10224 to make it a perfect square? [Ans: 71]

Q.3. Find the least square number (perfect square) which is exactly divisible by each one of the numbers 4, 8, 12. [Ans: 144]

Q.4. A school collected Rs. 7056 for Prime Minister's Relief Fund. If each student collected as many paise as these were students is the school. How many students were there in the school? [Ans: 840]

Q.5. What least no. should be subtracted from 4568 so that the resulting number becomes a perfect square? [Ans: 79]

Q.6. An army general arranges his soldiers in such a way that no. of row is same as the number of columns. In doing so he finds that 55 soldiers are left out. If the total number of soldiers is 6455, find the number of soldiers in each row. [Ans: 80]

Q.7. The area of a square is 59536m^2. Find the length of its side. [Ans: 244m]

Q.8. Find the greatest number of four digits which is a perfect square [Ans: 9801]

Q.9. (i) What no. when multiplied by itself will become 11881. [Ans: 109]

(ii) Express 49 as the sum of 7 odd natural numbers.

Q.10. Using suitable patterns, compute the following:

$$\frac{(666666)^2}{12345654321} =$$ [Ans: 36]

LEVEL-2

Q.1. Simplify:

$$\frac{\sqrt{0.2304}+\sqrt{0.1764}}{\sqrt{0.2304}-\sqrt{0.1764}}.$$ [Ans: 15]

Q.2. Evaluate $\sqrt{50625}$ and hence find the value of $\sqrt{506.25}+\sqrt{5.0625}$ [Ans: 225, 24.75]

Cube & Cube Roots

LEVEL-1

Q.1. Find the cube root of:

(i) 21952
(ii) 2744 [Ans: (i) 28, (ii) 14]

Q.2. Find the volume of a cube whose surface area is $150m^2$. (l=5) [Ans: $125m^3$]

Q.3. Evaluate:

(i) $\left\{\left(24^2+7^2\right)^{1/2}\right\}^3$ [Ans: 15625]

(ii) $\left\{\sqrt{15^2+8^2}\right\}^3$ [Ans: 4913]

Q.4. Three numbers are in the ratio 2:3:4. The sum of their cubes is 33957. Find the numbers. [Ans: 14, 21, 28]

Q.5. The volume of a cube is $9261000m^3$.Find the side of the cube. [Ans: 210m]

Q.6. Multiply 210125 by the smallest no. so that the product is a perfect cube. Also, find out the cube root of the product. [Ans: 41,205]

Q.7. What is the smallest number by which 8192 must be divided so that quotient is a perfect cube? Also find the cube root of the quotient so obtained. [Ans: 2, 16]

LEVEL-2

Q.1. Evaluate: $\sqrt[3]{\frac{0.027}{0.008}}\div\sqrt{\frac{0.09}{0.04}}-1$ (Ans: 0)

Q.2. Simplify:

$125\sqrt[3]{a^6} - \sqrt[3]{125a^6}$ (Ans: $120a^2$)

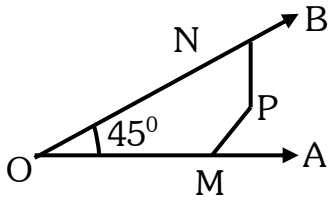
Understanding Quadrilaterals

LEVEL-1

Q.1. The interior angle of a regular polygon is 156^0. Find the numbers of sides of the polygon. [Ans: 15]

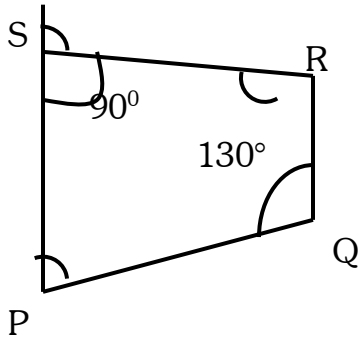
Q.2. In a quadrilateral ABCD, the angles A, B, C and D are in the ratio 1:2:3:4. Find the measures of each angles of the quadrilateral. [Ans: 36^0, 72^0, 108^0, 144^0]

Q.3. Find the measure of $\angle MPN$ if $PN \perp \vec{OB}$ and $PM \perp \vec{OA}$. [Ans: 135^0]

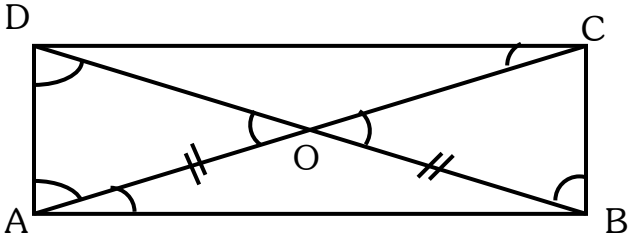


Q.4. Two adjacent angles of a parallelogram are as 2:3. Find the measures of all the angles. [Ans: 72^0, 108^0, 72^0, 108^0]

Q.5. PQRS is a trapezium in which SP||RQ, find the measures of $\angle P$ and $\angle R$. [Ans: $\angle P=50^0$, $\angle R=90^0$]

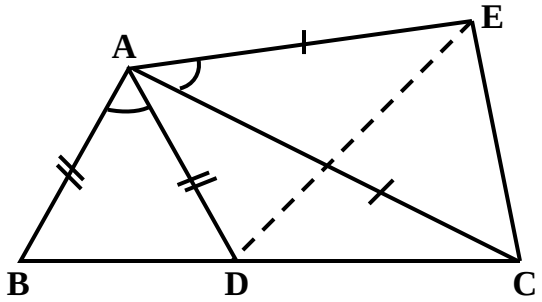


Q.6. The diagonals of a rectangles ABCD intersect at O. If $\angle BOC=68^0$, find $\angle ODA$. [Ans: $\angle ODA=56^0$]



LEVEL-2

Q.1. In figure AC=AE, AB=AD and ∠BAD=∠EAC. Prove that BC=DE.



Algebraic Expressions & Identities

LEVEL-1

Q.1. Add:-

(i) $5x^2-\frac{x}{3}+\frac{5}{2},\ -\frac{1}{2}x^2+\frac{1}{2}x-\frac{1}{3}$ and $-2x^2+\frac{1}{5}x-\frac{1}{6}$

(ii) $2,\ \frac{2y}{3}-\frac{5y^2}{3}+\frac{5y^3}{2},\ -\frac{4}{3}+\frac{2y^2}{3}-\frac{y}{2},\ \frac{5y^3}{3}+3y^2+3y+\frac{6}{5}$

(Ans: *(i)* $\frac{5x^2}{2}+\frac{11}{30}x+2$ *(ii)* $\frac{25}{6}y^3+2y^2+\frac{19}{6}y+\frac{28}{15}$)

(iii) If $x^2+\frac{1}{x^2}=27.$

Find $\left(x-\frac{1}{x}\right)$ (Ans: ± 5)

Q.2. Simplify :-

(i) $15a^2-6a(a-2)+a(3+7a)$ (Ans: $16a^2+15a$)

(ii) $a^2b(a-b^2)+ab^2(4ab-2a^2)-a^3b(1-2b)$ (Ans: $3a^2b^3$)

(iii) $a^2b(a^3-a+1)-ab(a^4-2a^2+2a)-b(a^3-a^2-1)$ (Ans: b)

Q.3. Find the following product and verify the result for $x = -1$, $y = -2$

(i) $(x^2y-1)(3-2x^2y)$ (Ans: $5x^2y-2x^4y^2-3$)

(ii) $\left(\frac{1}{3}x-\frac{y^2}{5}\right)\left(\frac{x}{3}+\frac{y^2}{5}\right)$ (Ans: $\frac{x^2}{9}-\frac{y^4}{25}$)

Q.4. Find the value of x if :-

(i) $6x = 23^2 - 17^2$ (Ans: $x = 40$)
(ii) $25x = 536^2 - 136^2$ (Ans: $x = 10752$)
(iii) $5x = (50)^2 - (40)^2$ (Ans: 180)
(iv) $(47)^2 - (33)^2 = 14x$ (Ans: 80)

Q.5. Evaluate :-

(i) 107×103 (Ans: 11021)
(ii) 994×1006 (Ans: 999964)
(iii) 103×96 (Ans: 9888)

LEVEL-2

Q.1. If $x + 1/x = 20$ find the value of

(i) $x^2 + 1/x^2$ (Ans: 398)

(ii) $x^4+\frac{1}{x^4}$

Q.2. (i) If $a^2+b^2+c^2-ab-bc-ca=0$, Prove that a=b=c.

Linear Equations In One Variable

LEVEL-1

Q.1. Solve:- Ans:-

(i) $\frac{6x^2+13x-4}{2x+5}=\frac{12x^2+5x-3}{4x+3}$ $x=-\frac{3}{4}$

(ii) $\frac{x^2-(x+1)(x-2)}{5x+1}=6$ $x=\frac{-4}{29}$

(iii) $\frac{2x-3}{2}-\frac{x-1}{3}=\frac{3x-8}{4}$ $x=-10$

Q.2. The sum of the ages of father and son is 42 years. After 4 year, the age of father will be 4 times the age of the son. Find their present ages.
[Ans: 6 years & 36 years]

Q.3. I have Rs 34, as 50 paise and 25 paise coins. If number of 25 paise coins be twice the number of 50 paise coins, how many coins of each kind do I have?
[Ans: 34, 68]

LEVEL-2

Q.1. Divide Rs. 500 between Anjali and Dipti such that one-third share of Anjali and half share of Dipti are equal. [Anjali=Rs 300, Dipti's share= Rs 200]

Q.2. A number plus two-third of itself, plus one –half of itself, plus one-seventh of itself equals 97. Find the number. [Ans: 42]

Q.3. $\frac{2}{3}(4x-1)-\left(4x-\frac{1-3x}{2}\right)=\frac{x-7}{2}$ [Ans: $x=1$]

Data Handling

Q.1. Pooja spends different hours of a working day as follows:

Activity	School	Home Assignment	Play	Sleep	Other
No. of hour	8	3	2	8	3

Draw a pie chart to represent the above data.

Q.2. Find the probability of:

(i) Getting a tail when a coin is tossed. (Ans: ½)

(ii) Getting the number 4 when a die is thrown. (Ans: $\frac{1}{6}$)

Q.3. The height of 20 students of a class are given as under:

Heights (in cm)	No. of Students
120-125	1
125-130	2
130-135	4
135-140	2
140-145	6
145-150	4

Draw a bar graph to represent the above data.

Q.4. Find the probability of getting at least two heads when two coins are tossed.
(Ans: $\frac{1}{4}$)

Q.5. Find the probability of getting a doublet when two dice are thrown. (Ans: $\frac{1}{6}$)

Mensuration

LEVEL-1

Q.1. How many wooden cubical blocks of side 25cm can be cut from a log of wood of size 3m 75cm by 50cm, assuming that there is no wastage? [Ans: 72]

Q.2. If the rainfall on a certain day was 5cm, how many liters of water fell on 1 hectare field on that day? [Ans: 500000 lt]

Q.3. A solid cylinder has total surface area of 462 cm^2. Its curved surface area is $\frac{1}{3}rd$ of its total surface area. Find the volume of the cylinder? [Ans: 539 cm^3]

Q.4. A room is 7m long and 5m broad. It has one door measuring 2m by 1.5m and 2 windows each measuring 1.5m by 1m. The cost of painting the walls at Rs. 12.50 per square meter is Rs. 825. Find the height of the room. [Ans: 3m]

Q.5. A godown is in the form of a cuboid of measures 60m × 40m × 30m. How many cuboidal boxes can be stored in it if the volume of one box is 0.8m^3?
[Ans: 90000]

Q.6. A well with 10m inside diameter is dug 14m deep. Earth taken out of it is spread all around to a width of 5m to form an embankment. Find the height of embankment?
[Ans: 4.66 m]

Q.7. Two adjacent angles of a parallelograms are in the ratio 2 : 3. Find the measure of each of its angles. [Ans: 72^0, 108^0, 72^0, 108^0]

LEVEL-2

Q.1. The radius of 2 right circular cylinder are in the ratio 2 : 3 and their heights are in the ratio 5 : 4. Calculate the ratio of their curved surface areas and also the ratio of their volumes. [Ans: 5:6, 5:9]

Q.2. Find the number of coins, 1.5cm in diameter and 0.2cm thick, to be melted to form a right circular cylinder of height 10cm and diameter 4.5cm. [Ans: 450]

Q.3. Two cubes each of 10 cm edge are joined end to end, find the surface area of resulting cuboid. (Ans: $1000\,cm^2$)

Practical Geometry

LEVEL-1

Q.1. Construct a quadrilateral ABCD given AB = 3.5cm, BC=4cm, CD=4.5cm, DA=5 cm and $\angle B=60^0$.

Q.2. Construct a quadrilateral ABCD given that AB=5cm, BC= 4.5cm, CD=4cm. $\angle B=60^0$ and $\angle C=135^0$.

Q.3. Construct a quadrilateral ABCD given that AB=5cm, BC=4cm, $\angle B=60^0$, $\angle A=90^0$ and $\angle C=135^0$.

Q.4. Construct a parallelogram ABCD given that AB=3.5cm, BC=5.5cm and $\angle B=75^0$.

Q.5. Construct a parallelogram ABCD given that AB=5.5cm, AD=4cm and a diagonal BD=6.5cm.

Q.6. Construct a square ABCD given that diagonal AC=6cm.

Q.7. Construct a rectangle ABCD given that side AB=5cm and the diagonal AC=5.5cm.

Q.8. Construct a rhombus ABCD given that side AB=4.5cm and a diagonal is 7cm.

Q.9. Construct a rhombus ABCD whose diagonals AC and BD are 7cm and 5cm respectively.

LEVEL-2

Q.1. Construct a kite ABCD in which AB= 4 cm, BC= 4.9 cm, AC= 7.2 cm.

COMPARING QUANTITIES

Points to Remember:

(1) Profit = SP−CP

(2) $\text{Gain} = \frac{P\%}{100} \times C.P$

$\text{P\%} = \frac{P}{CP} \times 100$

(3) $\text{CP} = \frac{100}{100 + \text{Gain\%}} \times \text{S.P}$

(4) $\text{SP} = \left(\frac{100 + \text{Gain\%}}{100}\right) \times \text{CP}$

(5) $\text{Loss} = \text{CP} - \text{SP}$

(6) $\text{Loss\%} = \frac{\text{Loss}}{\text{CP}} \times 100$

(7) $\text{CP} = \left(\frac{100}{100 - \text{Loss\%}}\right) \times \text{SP}$

(8) $\text{SP} = \left(\frac{100 - \text{Loss\%}}{100}\right) \times \text{CP}$

(9) $\text{Discount} = \text{MP} - \text{SP}$

(10) $\text{Discount\%} = \frac{\text{Discount}}{\text{MP}} \times 100$

$\text{D\%} = \left(\frac{MP - SP}{MP}\right) \times 100$

(11) $\text{SP} = \text{MP}\left(\frac{100 - \text{Discount\%}}{100}\right)$

(12) $\text{MP} = \left(\frac{100 \times \text{SP}}{100 - \text{Discount\%}}\right)$

(13) $\text{Increase or Decrease Percent \%} = \frac{\text{Actual increase or decrease}}{\text{Original Price}} \times 100$

(14) $\text{A} = \text{P}\left(1 + \frac{r}{100}\right)^n$

(15) $\text{CI} = \text{A} - \text{P}$

(16) Amount when interest is compounded half-yearly

$$A = P\left(1+\frac{\frac{r}{2}}{100}\right)^{2n} \quad \text{where } \frac{R}{2} = \text{half-yearly rate} \qquad 2n = \text{number of half-year's}$$

(17) $\text{VAT} = \text{SP} \times \frac{\text{Rate of VAT}}{100}$

(18) $\text{Rate of Sales Tax \%} = \frac{S.T \times 100}{CP}$

(19) Price including VAT = SP + VAT

LEVEL-1

Q.1. Sumit saves 14% of his salary, while Gaurav saves 22%. If both get the same salary and Gaurav saves Rs. 1540. Find the savings of Sumit and the salary of each of them. [Ans: Rs. 980, Rs. 7000]

Q.2. Divya bought a set of cosmetic items for Rs. 345 including 15% sales tax and a price for Rs. 110 including 10% sales tax. What percent is the sales tax charged on the whole transaction. [Ans: 13.7%]

Q.3. Price of a DVD player including 12% VAT is Rs 4480. Find the price of DVD player before VAT is added. [Ans: Rs. 4000]

Q.4. Rahul sells 2 watches for Rs. 1955 each gaining 15% on one and losing 15% on the other. Find his gain or loss percent in the whole transaction.[Ans: Loss 2¼%]

Q.5. Dhruv took a loan of Rs. 390625 from a finance company. If the company charges interest at 16% per annum, compounded quarterly, what amount will discharge his debt after one year? [Ans: Rs. 456976]

Q.6. Find the amount and the compound interest on Rs. 1,60,000 for 2 years at 10% p.a. compounded half-yearly. [Ans: A=Rs. 194481 C.I. Rs. 34481]

Q.7. By selling a T-shirt for Rs 432, a shopkeeper loses 4%. For how much should he sell it to gain 6%? [Ans: Rs. 477]

Q.8. In a factory the production of the item rose to 48400 from 40,000 in 2 years. Find the rate of growth per annum. [Ans: 10% p.a.]

Q.9. An article was sold at a gain of 12%. Had it been sold for Rs 33 more the gain would have been 14%. Find the cost price of the article? [Ans: Rs. 1650]

LEVEL-2

Q.1. The salary of an officer has been increased by 50%. By what % the new salary must be reduced to restore the original salary. (Ans: $33\frac{1}{3}\%$)

Q.2. A dishonest dealer professes to sell his goods a C.P., but he uses a weight of 960 gms for 1 kg. Find his P%? (Ans: $4\frac{1}{6}$)

Exponents & Powers

LEVEL-1

Q.1. Simplify:

(i) $\left(\frac{-1}{2}\right)^5 \times \left(\frac{-1}{2}\right)^3$ *(iii)* $(5^{-1}\times 3^{-1})^{-1} \div 6^{-1}$

(ii) $(6^{-1}-8^{-1})^{-1}+(2^{-1}-3^{-1})^{-1}$ *(iv)* $\{6^{-1}+(3/2)^{-1}\}^{-1}$

Q.2. Evaluate:

(i) $\frac{8^{-1}\times 5^3}{2^{-4}}$

(ii) $(3/7)^{-2} \times (7/6)^{-3}$

(iii) $\left[\left\{\left(-\frac{1}{5}\right)^{-5}\right\}^{+2}\right]^{-1}$

(iv) $\frac{3^{-5}\times 10^{-5}\times 125}{5^{-7}\times 6^{-5}}$

Q.3. Find m so that $(5/3)^{-5}\times(5/3)^{-11}=(5/3)^{8m}$

Q.4. By what number should $(-8)^{-1}$ be multiplied so that product may be equal 10^{-1}.

LEVEL-1

Q.1. Find:

$$\frac{(x^{a+b})^2(x^{b+c})^2(x^{c+a})^2}{(x^a.x^b.x^c)^4}$$

Q.2. If $x = \left(\frac{3}{2}\right)^2 \times \left(\frac{2}{3}\right)^{-4}$, find the value of x^{-2}.

Answers

Q.1. *(i)* $\frac{1}{256}$ Q.2. *(i)* 250 Q.3. – 2

(ii) 30 *(ii)* 24/7 Q.4. -4/5

(iii) 90 (iii) $\left(-\frac{1}{5}\right)^{10}$ Q.5. 1

(iv) $\frac{6}{5}$ (iv) 5^5

Factorization

LEVEL-1

- When an expression is the product of two or more expressions, then each of these expressions is called the factor of the given expression.
- The process of writing a given expression as a product of two or more factors is called factorization.
- A systematic way of factorizing an expression is common factor method. Also terms of an expression can be grouped in such a way that all the terms in each group have a common factor. This is method of regrouping.
- If given expression is in form of $x^2 + x\,(a + b) + ab$ then we factorize it in the form $(x + a)\,(x + b)$.
- If the given expression is the difference of two squares, then to factorize it we use formula $a^2 - b^2 = (a + b)\,(a - b)$
- If the given expression is a complete square, we use following formula to factorize it.
  - $a^2 + 2ab + b^2 = (a + b)^2 = (a + b)\,(a + b)$
  - $a^2 - 2ab + b^2 = (a - b)^2 = (a - b)\,(a - b)$

Q.1. Factorize the following:

(1) $4ab - b$ (2) $6x^3 - 8x^2y$

(3) $x^2 + 8x + 15$
(4) $9m^2 - 24mn + 16n^2$
(5) $4p^2 - 9q^2$
(6) $x^3 - 144x$
(7) $2a^2 + 4a - 6$
(8) $a^2 + ab + 8a + 8b$
(9) $-4a^2 + 4ab - 4ca$
(10) $a(a + z) + 7(a + z)$
(11) $x^2 + x - 56$
(12) $2x^3 + 2xy^2 + 2xz^2$
(13) $3a^4 - 48b^4$
(14) $(x-y)^2+(x-y)$
(15) $14a(8+z)^3+7a(8+z)$
(16) x^4-625
(17) x^3-144x
(18) $15xy - 6x + 5y - 2$
(19) $x + 1 + kx + k$
(20) $96 - 6x - 2x^2$
(21) $20x^3 - 40x^2 + 80x$
(22) $16x^5-144x^3$
(23) $36y^2-36y+9$
(24) $x^3 - 169x$
(25) $a^2 - b^2 - a - b$
(26) $81-(p+1)^2$
(27) $x^5 - 16x^3$
(28) $16(2x - 1)^2 - 25y^2$
(29) $2x^3y^2 - 4x^2y^3 + 8xy^4$
(30) $4p^2 - 9q^2$

Q.2. Workout the following divisions:

(i) $(x^2 + 12x + 35) \div (x + 7)$
(ii) $(a^2 - b^2) \div (a - b)$
(iii) $(7z^3 - 6z^2 + 5z) \div 2z$
(iv) $(3a^5 - 48a^3) \div a(a - 4)$
(v) $(x^2 - 11xy - x + 11y) \div (x - 1)$
(vi) $(x^2 - 2ax - 2ab + bx) \div (x+b)$
(vii) $(-4a^3 + 4a^2 + a) \div 2a$
(viii) $\frac{2}{3}x^2 \div x$
(ix) $21(x^2 - 6x - 16) \div (x + 2)$

LEVEL-2

Q.1. (i) $4a^4 + 1$ (ii) $25x^4y^4 - 1$

[Ans:(i) $(2x^2 + 2x + 1)(2x^2 - 2x + 1)$ (ii) $(5x^2y^2 - 1)(5x^2y^2 + 1)$

Answer (Level-1)

Q.1.
(1) $b(4a - 1)$
(2) $2x^2(3x - 4y)$
(3) $(x + 3)(x + 5)$
(4) $(3m - 4n)(3m - 4n)$
(5) $(2p - 3q)(2p + 3q)$
(6) $x(x - 12)(x + 12)$
(7) $2(a + 3)(a - 1)$
(8) $(a + 8)(a + b)$
(9) $-4a(a - b + c)$
(10) $(a + 7)(a + z)$
(11) $(x + 8)(x - 7)$
(12) $2x(x^2 + y^2 + z^2)$
(13) $(a - 2b)(a + 2b)(a^2 + 4b^2)$
(14) $(x - y)(x - y + 1)$
(15) $7a(8 + z)(129 + 2z^2 + 32z)$
(16) $(x^2 + 25)(x - 5)(x + 5)$
(17) $x(x - 12)(x + 12)$
(18) $(3x + 1)(5y - 2)$
(19) $(k + 1)(x + 1)$
(20) $2(48 - 3x - x^2)$
(21) $20x(x^2 - 2x + 4)$
(22) $16x^3(x - 3)(x + 3)$
(23) $(6y - 3)(6y + 3)$
(24) $x(x - 13)(x + 13)$
(25) $(a + b)(a - b - 1)$
(26) $(8 - p)(10 + p)$
(27) $x^3(x - 4)(x + 4)$
(28) $(8x - 4 - 5y)(8x - 4 + 5y)$
(29) $2xy^2(x^2 - 2xy + 4y^2)$
(30) $(2p + 3q)(2p - 3q)$

Ans.2.

(i) $x + 5$

(ii) $a + b$

(iii) $\frac{7z^2 - 6z + 5}{2}$

(iv) $3a^2(a + 4)$

(v) $x - 11y$

(vi) $x - 2a$

(vii) $-2a^2 + 2a + \frac{1}{2}$

(viii) $\frac{2x}{3}$

(x) $21(x - 8)$

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Direct And Inverse Proportion

LEVEL-1

Q.1. An agent receives a commission of Rs. 80.00 on sale of Rs. 1000.00. How much commission will he get on sale of Rs. 100.00?

Q.2. The amount of extension in an elastic spring varies directly as the weight hung on it. If a weight of 150gm produces an extension of 2.9cm, then what weight would produce an extension of 17.4cm?

Q.3. A car is travelling at the average speed of 50km/hr. How much distance would it travel in 12 minutes?

Q.4. In 15 days, the earth picks up 1.2×10^8kg of dust from the atmosphere. In how many days it will pick up 4.8×10^8kg of dust?

Q.5. If 56 men can do a piece of work in 42 days. How many men will do it in 14 days?

Q.6. A shopkeeper has just enough money to buy 52 bicycles worth Rs. 525 each. If each bicycle were to cost Rs. 21 more, then how many bicycles would he be able to buy with that amount of money?

Q.7. 18 men can reap a field in 35 days. For reaping the same field in 15 days, how many men are required?

Q.8. If x and y vary inversely as each other, and $x=10$ when $y=6$. Find y when $x=15$.

LEVEL-2

Q.1. A group of 3 friends staying together consume 54 kg of wheat every month. Some more friends join this group and they find that the same amount of wheat lasts for 18 days. How many new members are in the group now? [Ans: 2]

Answers (Level-1)

Q.1. Rs. 8
Q.2. 900 g
Q.3. 10 km.
Q.4. 60 days
Q.5. 168
Q.6. 50 bicycles
Q.7. 42 men
Q.8. $y=4$

Playing with Numbers

Q.1. Write generalized form for the following numbers:-

(i) 54 *(iii)* 800
(ii) 888 *(iv)* 970

Q.2. If $\begin{array}{r} 1\,A \\ \times\ A \\ \hline 7\,A \end{array}$ Find the value of A.

Q.3. $\begin{array}{r} 2\,A\,B \\ +A\,B\,1 \\ \hline B\,1\,8 \end{array}$ Find the values of A and B.

Q.4. Complete the following patterns:-

(i)

	88	=	9		×	9	+	7
	888	=	98		×	9	+	6
	———	=	987		×	9	+	–
	88888	=	98765		×	–	+	4
	———	=	———		×	9	+	–

(ii)

12345679	×	9	=	111111111	
12345679	×	18	=	———	
———	×	–	=	———	
———	×	36	=	444444444	
———	×	–	=	———	
12345679	×	54	=	666666666	

(iii)

5	×	5	=	25	
35	×	35	=	1,225	
———			=	112,225	
3335	×	3335	=	———	
33335	×	33335	=	———	

(iv)

4^2	=	16
34^2	=	1,156
$(\quad)^2$	=	111,556
$(3334)^2$	=	———
$(33{,}334)^2$	=	———

Q.5. 215006*x* is a multiple of 10, where *x* is a digit, what is the value of *x*?

Q.6. 70081*y* is a multiple of 2, where *y* is a digit, what is the value of *y*?