BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOI
ANNUAL EXAMINATION 2024-25
MATHEMATICS (041)
ANSWER KEYS

CLASS:VII
Date: 15.03.2025
Name:

Duration: 3 hrs.
MAX.MARKS:80
Exam R.No:

General Instructions:

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

SECTION-A $(20 \times 1 = 20)$

Choose the correct answer.

1) $2^2 \times 2^3 \times 2^4$ is equal to:
   a) 2^9 b) 2^{24} c) 2^{-5} d) 2^{-9}
2) 700000000 is equal to:
   a) 7×10^6 b) 7×10^7 **c) 7×10^8** d) 7×10^9
3) The difference between maximum and minimum value of a data is called _____
   a) Frequency b) median c) mean **d) range**
4) If two lines intersect each other, then the vertically opposite angles are:
   a) Equal b) Unequal c) Cannot be determined d) none of these
5) The range of the weights (in kg) of students of a class given below is: 49, 60, 47, 50, 47, 59, 58, 45, 53
   a) 2 b) 20 **c) 15** d) 10
6) Express in exponential form $2 \times 2 \times a \times a \times a \times a$.
   a) $(2a)^2$ b) $(2a)^4$ **c) $2^2 \times a^4$** d) none of these
7) Convert 0.2 into percent
   a) 60% **b) 20%** c) 10% d) 2%
8) The fraction 2/5 converted to percentage is
   a) 20% b) 30% **c) 40%** d) 50%
9) Area of a triangle
   a) base × height **b) $\frac{1}{2}$base × height** c) $\frac{1}{3}$base × height d) $\frac{1}{4}$base × height
10) The area of a parallelogram of base 5 cm and height 3.2 cm is
   a) 12 cm2 **b) 16 cm^2** c) 8 cm2 d) 20 cm2
11) Algebraic expression that contains only one term is called:
   a) Monomial b) Binomial c) Trinomial d) None of these
12) In which of the following expression is like terms?
   a) 7x and 7y **b) 7xy and 9yx** c) 7x and $7x^2$ d) $9y^2x$ and $7x^2y$
13) The mode of the distribution 3,5, 7, 4, 2, 1, 4, 3, 4 is
   a) 3 b) 2 **c) 4** d) 7
14) How many medians can a triangle have?

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

15) Which of the following pair of angles are complementary?

a) 48°, 42° b) 160°, 20° c) 79°, 21° d) 75°, 105°

16) Which is the longest side of a right triangle?

a) Base b) Perpendicular **c) Hypotenuse** d) None of these

17) The mean of the numbers 10,20, 30, and 40 is

a)20 **b) 25** c) 30 d) 50

18) 5x+6y is a:

a) Monomial **b) Binomial** c) Trinomial d) None of these

19) Assertion: The pair of two supplementary angles is 60° & 120° .

Reason: When the sum of the measures of two angles is 180°, the angles are called supplementary angles.

a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion

b) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.

c) Assertion is true but the reason is false.

d) Both assertion and reason are false.

20) Assertion: $4x^2$ is a monomial

Reason: In Monomial contain only one term.

a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

b) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.

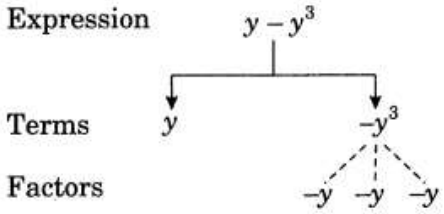
c) Assertion is true but the reason is false.

d) Both assertion and reason are false.

SECTION-B $(5 \times 2 = 10)$

21) Show the terms and factors by tree diagrams.

$y - y3$



_____ **(2)**

OR

If m = 2, find the value of: $3m^2 - 2m - 7$

$3(2)^2 - 2(2) - 7$ =

$3 \times 4 - 4 - 7$ _____ **(1)**

$=12 - 4 - 7$

$= 12 - 11$

$= 1$ _____ **(1)**

22) Find the area of the following triangle.

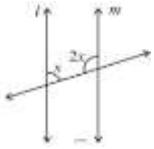
b = 8.2 cm and h = 6.6 cm

Area =(1/2) base × height _____ **(1)**

= (1/2) × 8.2 cm × 6.6 cm

= 27.06 sq.cm. _____ **(1)**

23) Find the value of x in each of the following figures if l || m.



Sum of interior angles on the same side of transversal

$x + 2x = 180°$ _____ **(1)**

$3x = 180^0$

$x = 60^0$ _____ **(1)**

24) Express 512 a product of prime factors only in exponential form:

2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^9$ _____ **(2)**

OR

Identify the greater number of the following?

5^3 or 3^5

5^3 or 3^5

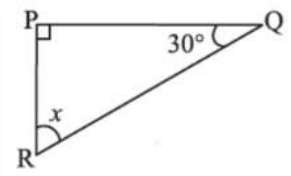
$5^3 = 5 \times 5 \times 5 = 125$ _____ **(1)**

$3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

Since $243 > 125$ _____ **(1)**

$\therefore 3^5$ is greater than 5^3.

25) Find the value of the unknown x in the following diagrams:



By angle sum property of a triangle, we have

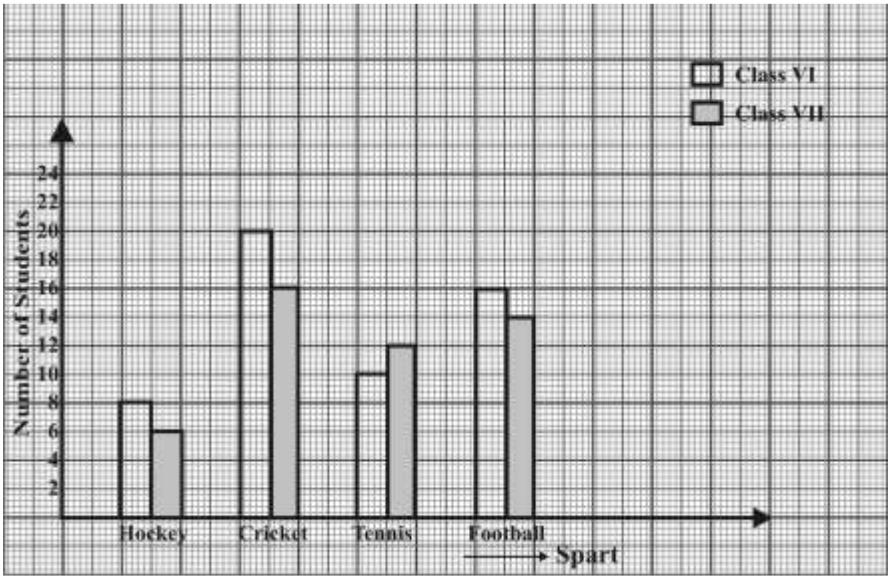
$\angle x + 90° + 30 = 180°$ [Δ is right angled triangle] _____ **(1)**

$\Rightarrow \angle x + 120° = 180°$

$\therefore \angle x - 180° - 120° = 60°$ _____ **(1)**

SECTION-C $(6 \times 3 = 18)$

26) Study the double bar graphs given below and answer the following que

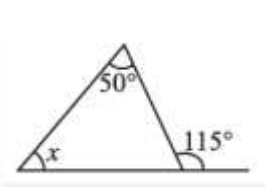


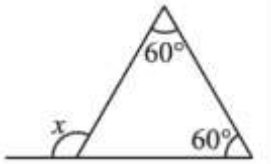
a) **Cricket** liked the most by class VII students? **(1)**

b) No. of student of Class VI like hocky and football = **8+ 16 = 24** **(1)**

c) For which sport the number of students of class VII is more than that of class VI.– **Tennis** **(1)**

27) Find the value of the unknown angle x in the following figures:





∠x + 50° = 115° (Exterior angle of a triangle) _____ **$(1\frac{1}{2})$**

∠x = 60° + 60° = 120° (Exterior angle is equal to sum of its interior opposite angles) __ **$(1\frac{1}{2})$**

28) Using laws of exponents, simplify and write the answer in exponential form)

a) $(2^{20} \div 2^{15}) \times 2^3$ b) $(3^4)^5$ c) $3° \times 5° + 19°$

a) $=(2^{20} \div 2^{15}) \times 2^3 = 2^{20-15} \times 2^3$

$=2^5 \times 2^3 = 2^{5+3} = 2^8$ _____ **(1)**

b) $(3^4)^5 = 3^{20}$ _____ **(1)**

c) $3° \times 5° + 19° = 1 \times 1 + 1 = 1 + 1 = 2$ _____ **(1)**

29) Arun bought a car for Rs3,50,000. The next year, the price went up to Rs 3,70,000. What was the Percentage of price increase?

Original price of the car = □ 3,50,000

Price increased next year = □ 3,70,000

Increase in price = □ 3,70,000 – □ 3,50,000 _____ (1)

= □ 20,000 _____ (1)

∴ Percentage of the increase in the price

$= \frac{20,000 \times 100}{3,50,000} = \frac{40}{7}\% = 5\frac{5}{7}\%$

Hence, the Percentage of increase in price = $5\frac{5}{7}\%$

_____ (1)

OR

Tell what is the profit or loss in the following transactions. Also find profit per cent or loss per cent in each case.

A cupboard bought for Rs 2,500 and sold at Rs 3,000.

Here, CP = □ 2500

SP = □ 3000

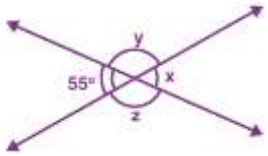
Since SP > CP

∴ Profit = SP – CP _____ (1)

= □ 3000 – □ 2500 = □ 500 _____ (1)

Hence, the required profit = □ 500 and profit% = 20% _____ (1)

30) Find the values of the angles x, y, and z in each of the following:



∠x = ∠55° (Vertically opposite angles)

∠x + ∠y = 180° (Adjacent angles)

55° + ∠y = 180° (Linear pair angles)

∴ ∠y = 180° – 55° = 125° _____ (1)

∠y = ∠z (Vertically opposite angles)

125° = ∠z _____ (1)

Hence, ∠x = 55°, ∠y = 125° and ∠z = 125° _____ (1)

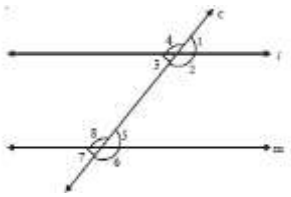
OR

State the property that is used in each of the following statements

a) If $l \parallel m$, then ∠4 = ∠8

b) If ∠1 = ∠7, then $l \parallel m$

c) If ∠3 + ∠8 = 180°, then $l \parallel m$



(a) Given $l \parallel m$

∴ ∠4 = ∠8 (Pair of corresponding angles) _____ (1)

(b) Given: ∠1 = ∠7

∴ $l \parallel m$ [If pair of alternate exterior angles are equal, then the lines are parallel] ____ (1)

(c) Given: ∠3 + ∠8 = 180°

∴ $l \parallel m$ [If sum of interior angles is 180°, then the lines are parallel] _____ (1)

31) When a = 0, b = – 1, find the value of the given expressions: $2a^2b + 2ab^2 + ab$

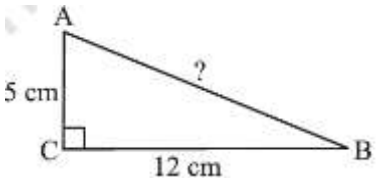
$=2a^2b + 2ab^2 + ab$ _____ (1)

$=2(0)^2(-1) + 2(0)(-1)^2 + (0)(-1)$ _____ (1)

=0 + 0 + 0 = 0 _____ (1)

SECTION-D $(4 \times 5 = 20)$

32) ABC is right-angled at C. If AC = 5 cm and BC = 12 cm find the length of AB.



By Pythagoras property,

$AB^2 = AC^2 + BC^2$ ____ **(1)**

$= 5^2 + 12^2$ ____ **(1)**

$= 25 + 144$ ____ **(1)**

$= 169 = 13^2$ ____ **(1)**

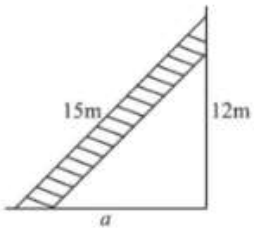
$AB^2 = 13^2$.

So AB = 13 ____ **(1)**

OR

A 15 m long ladder reached a window 12 m high from the ground on placing it against a wall at a distance a. Find the distance of the foot of the ladder from the wall.

By the rule of Pythagoras' Theorem,



$15^2 = 12^2 + a^2$ ____ **(1)**

$225 = 144 + a^2$ ____ **(1)**

$a^2 = 225 – 144$ ____ **(1)**

$a^2 = 81$ ____ **(1)**

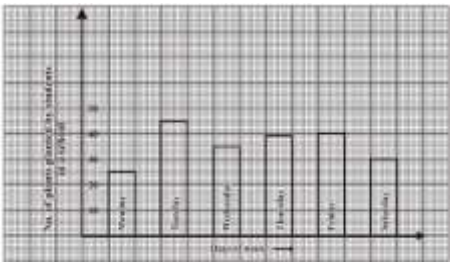
$a = \sqrt{81}$

a = 9 m ____ **(1)**

Hence, the length of a = 9 m

33) Observe the following data and answer the questions that follow :

Days of the Week	Mon	Tue	Wed	Thu	Fri	Sat
No. of plants planted by students in a shchool	25	45	35	38	40	30



a) Draw a bar graph to represent the above given in formation. _____ **(3)**

b) On which day of the week maximum number of plants planted. **Tuesday** _____ **(1)**

c) Find the ratio of the minimum and maximum number of plants. **25:45 = 5:9** _____ **(1)**

34) From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1cm are removed. (As shown in the adjoining figure.) Find the area of the remaining sheet. (Take $\pi = 22/7$)

Solution:

Radius of the circular sheet = 14 cm

$\therefore$ Area = $\pi r^2 = \frac{22}{7} \times 14 \times 14\ cm^2$

$= 616\ cm^2$

Area of 2 small circles = $2 \times \pi r^2$

$= 2 \times \frac{22}{7} \times 3.5 \times 3.5\ cm^2$

$= 77.0\ cm^2$

Area of the rectangle = l x b

$= 3 \times 1\ cm^2 = 3\ cm^2$

Area of the remaining sheet after removing the 2 circles and 1 rectangle

$= 616\ cm^2 - (77 + 3)\ cm^2$

$= 616\ cm^2 - 80\ cm^2 = 536\ cm^2$

35) Convert 2 : 3 : 5 each part of the ratio to percentage:

Sum of the ratio parts = 2 + 3 + 5 = 10 _____ **(2)**

Percentage of first part $= \frac{2}{10} \times 100 = 20\%$

Percentage of second part $= \frac{3}{10} \times 100 = 30\%$

Percentage of third part $= \frac{5}{10} \times 100 = 50\%$

_____ **(3)**

OR

Find the amount to be paid at the end of 3 years if Principal = Rs 1,200 at 12% p.a.

Given: Principal = □ 1200

Rate of interest = 12% p.a., T = 3 years _____ **(1)**

$\therefore$ Interest $= \frac{P \times R \times T}{100}$ _____ **(1)**

$= \frac{1200 \times 12 \times 3}{100}$ **= Rs 432** _____ **(1)**

Amount = Principal + Interest _____ **(1)**

= □ 1200 + □ 432

= □ 1632 _____ **(1)**

Hence, the required amount = □ 1632

SECTION-E **$(3 \times 4 = 12)$**

36) A Maths test was conducted in class 7 to assess the learning of the students. So, the teacher made some statements and the students were asked to express it algebraically.

a) One third of the product of x and y. = $\frac{1}{3}xy$ _____**(1)**

b) A number multiplied by itself = x^2 _____ **(1)**

c) Sum of two number x and y subtracted from their product = $xy - (x + y)$____ **(2)**

37) Chalk contains calcium, carbon and oxygen in the ratio 10:3:12.

a) Find the percentage of carbon in chalk. (1)

b) Find the percentage of calcium in chalk. (1)

c) If in a stick of chalk , carbon is 3gm, what is the weight of the chalk stick? (2)

(a) Sum of the ratio parts = 10 + 3 + 12 = 25

∴ Percentage of carbon in chalk

$= \frac{3}{25} \times 100\% = 12\%$ **____ (1)**

(b) ∴ Percentage of calcium in chalk

$= \frac{10}{25} \times 100\% = 40\%$ **____ (1)**

(c) Weight of carbon = 3 g

∴ Weight of chalk $= \frac{3 \times 100}{12}$ **= 25 g**

Hence, the weight of chalk = 25 g ____ (2)

38) Meera is very good in needle work and so wants to put a lace all around a plain, while table cloth which is circular in shape and of radius 1m. (Take = 3.14)

a) Find the diameter of the cloth.

D = 2 × radius

D = 2 × 1 = 2m ____ (1)

b) Find the length of the lace required

Circumference = 2πr

= 2×3.14×1

= 6.28*m* **____ (2)**

c) Find the cost of the lace if 1m of lace costs Rs. 17.

6.28 × 17 = *Rs*106.76 _____ (1)

**********THE END**********