

KENDRIYA VIDYALAYA SANGATHAN



सत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

CBA TEST ITEMS



MATHEMATICS

CLASS 7



**ZONAL INSTITUTE OF EDUCATION AND TRAINING
MYSURU**

COURSE DIRECTOR

**Ms. MENAXI JAIN
DIRECTOR & DEPUTY COMMISSIONER
KVS ZIET MYSURU**

ASSOCIATE COURSE DIRECTOR

**SHRI. SIBY SEBASTIAN
PRINCIPAL
PM SHRI KV INS DRONACHARYA
KOCHI, ERNAKULAM REGION**

Resource Persons

**Mr. M. S. Kumar Swamy
TGT(Maths)
KV Gachibowli
HYDERABAD REGION
&
Ms P S Kavitha
TGT(Maths)
PM SHRI K V DRDO
BENGALURU REGION**

COURSE COORDINATOR

**D.SREENIVASULU
TRAINING ASSOCIATE(MATHEMATICS)
ZIET MYSURU**

DIRECTOR'S MESSAGE.....



It is with profound delight and utmost pride that we present the Competency Based Assessment question bank for **CLASS 7** which was prepared by TGT(Mathematics) of the feeder regions during the 03 – day workshop on “**Competency Based Assessment in Mathematics: Design of test items**” It’s my firm belief that access to quality education should know no boundaries, transcending social and economic constraints. Our collective vision is to empower all students and teachers with the tools for success and intellectual growth.

With their steadfast dedication, the TGT(Mathematics) from the feeder Regions namely Bangalore, Chennai, Ernakulam and Hyderabad have invested their knowledge and expertise in preparation of the CBA test items.

It is with pleasure that I place on record my commendation for the commitment and dedication of the team of TGT(Mathematics) from the four Regions, Shri. Siby Sebastian, Principal KV INS Dronacharya, Kochi, Ernakulam Region & Associate Course Director, the Resource persons Mr. M. S. Kumar Swamy, TGT(Maths), KV Gachibowli, Hyderabad & Ms P S Kavitha, TGT(Maths), K V DRDO Bengaluru and Mr. D. Sreenivasulu, Training Associate (Mathematics) from ZIET Mysore who has been the Coordinator of this assignment.

Wishing you all the very best in your academic journey!

MENAXI JAIN
DIRECTOR
ZIET MYSURU

Contributors.....

S.NO	NAME OF THE PARTICIPANTS AND DESIGNATION	NAME OF THE KV AND REGION	CHAPTERS
1	Mrs. GEETA UNNIKRISHNAN TGT (MATHS)	PM SHRI KV NO.1 MANGALORE BENGALURU	<ul style="list-style-type: none"> • INTEGERS • SYMMETRY
2	BINDU MENON TGT (MATHS)	PM SHRI KV CRPF YELAHANKA BENGALURU	<ul style="list-style-type: none"> • PERIMETER AND AREA
3	MR. VIKRAM MEENA TGT (MATHS)	NEYVELI CHENNAI	<ul style="list-style-type: none"> • FRACTIONS AND DECIMALS • VISUALISING SOLID SHAPES
4	Mrs. S SHARON TGT (MATHS)	PM SHRI KV COIMBATORE CHENNAI	<ul style="list-style-type: none"> • SIMPLE EQUATION
5	Mrs. ANJALI SINGH	PM SHRI K V NO.I CALICUT ERNAKULAM	<ul style="list-style-type: none"> • DATA HANDLING • LINES AND ANGLES
6	MR. AKASH TANWAR TGT (MATHS)	PM SHRI KV PATTOM (SHIFT II) ERNAKULAM	<ul style="list-style-type: none"> • TRIANGLE AND IT'S PROPERTIES • EXPONENTS AND POWER
7	Mrs.SK MAHATAB TGT (MATHS)	PM SHRI KV NELLORE HYDERABAD	<ul style="list-style-type: none"> • COMPARING QUANTITIES
8	Mr.VAKIL SINGH GULIA TGT (MATHS)	KV NTPC RAMAGUNDAM HYDERABAD	<ul style="list-style-type: none"> • RATIONAL NUMBERS • ALGEBRAIC EXPRESSION

INDEX

S.NO	CHAPTER	PAGES
1	INTEGERS	1 – 6
2	FRACTIONS AND DECIMALS	7 – 14
3	DATA HANDLING	15 – 26
4	SIMPLE EQUATIONS	27 – 32
5	LINES AND ANGLES	33 – 46
6	The Triangle and its Properties	47 – 55
7	COMPARING QUANTITIES	56 – 64
8	RATIONAL NUMBERS	65 – 76
9	PERIMETER AND AREA	77 – 87
10	ALGEBRAIC EXPRESSIONS	88 – 97
11	EXPONENTS AND POWERS	98 – 103
12	SYMMETRY	104 - 109
13	VISUALISING SOLID SHAPES	110 - 119

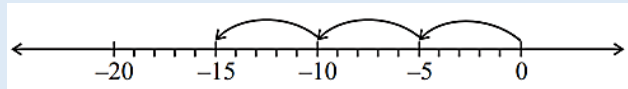
Note: DESCRIPTION OF ASSESSMENT OBJECTIVE

AO1	Demonstrate knowledge and understanding of mathematical ideas, techniques and procedures
AO2	Apply knowledge and understanding of mathematical ideas, techniques and procedures to classroom and real-world situations

CHAPTER -1: INTEGERS

MULTIPLE CHOICE QUESTIONS

1. A child makes 3 jumps over a marked line as shown. Identify the multiplication depicted here.



(AO1)

- (a) 5×3 (b) -5×3 (c) $-5 + 3$ (d) $-5 \times -10 \times -15$

2. Identify the property used in the following: (AO1)

$$(-2) \times 13 + 8 \times 13 = (-2+8) \times 13$$

- (a) Commutative (b) Inverse (c) Associative (d) Distributive

3. Identify the multiplication form of the following: (AO1)

$$(-4) + (-4) + (-4) \dots\dots\dots 25 \text{ times}$$

- (a) 4×5 (b) $(-4) \times 25$ (c) $(-4) \times 3$ (d) $(-4) \times (-25)$

4. Which among the following shows the maximum rise in temperature? (AO2)

- (a) 23°C to 32°C (b) -10°C to -1°C (c) -18°C to -11°C (d) -5°C to 5°C

5. Shani added few integers and got the following results. Which among these is false? (AO2)

- (a) $-7 + (-6) = -13$ (b) $-5 + 1 = 4$ (c) $2 + (-1) = 1$ (d) $8 + (-9) = -1$

6. The integer whose product with (-1) is (-40) is (AO2)

- (a) 20 (b) -20 (c) -40 (d) 40

7. The price of the stock decreased ₹45 per day for four consecutive days. What was the total change in value of the stock over 4-day period? (AO2)

- (a) ₹ 450 (b) ₹ 180 (c) ₹ 160 (d) ₹ 200

8. Which of the following statements is true? (AO2)

- (a) $7 \div 0 = 7$ (b) $7 \div 0 = 0$ (c) $7 \div 0 = 0 \div 7$ (d) $0 \div 7 = 0$

ASSERTION REASON QUESTIONS

Choose the correct option from the following:

- (a) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. Assertion: The value of $(-12) \times (-2) = 24$ (AO1)
Reason: Product of two negative integers is a positive integer.
10. Assertion: $p \div (-1) = -p$ (AO1)
Reason: Any number when divided by (-1) , results in the number itself.
11. Assertion: The additive inverse of 5 is (-5) (AO1)
Reason: The additive inverse of a positive integer is its negative integer.
12. Assertion: The value of $1 \div (-8) = -8$ (AO2)
Reason: Integers are not closed under division.

2 MARK QUESTIONS

13. Match the following (a is any integer and not equal to 0): (AO1)

Column I	Column II
$a \div (-1)$	a
$(-a) \div (-a)$	$-a$
$1 \div a$	1
$a \div 1$	not an integer

14. Represent on a number line: $3 \times (-2)$ (AO2)
15. If rice is sold at a profit of ₹4 per kg, what is the overall profit if 150 kg of rice is sold? (AO1)
16. Raj was eager to evaluate the following. Help him in writing the steps and arriving at the answer. (AO1)
- a. $(-39) \div [(-8) - 5]$
- b. $(-10) \times [(-13) + (-10)]$
17. State true or false: (AO1)
- a) Product of three negative integers is positive.
- b) Dividing a negative integer by a positive integer results in a negative integer.

3 MARK QUESTIONS

18. What will be the sign of the product if we multiply together: (AO1)
- (a) 8 negative integers and 3 positive integers?
- (b) seven times (-1) ?
- (c) $2m$ times (-1) , where m is a natural number?

19. A submarine submerges into the sea from the surface at the rate of 10 m/min. How long will it take to reach 0.3 km below the sea level? (AO2)
20. Ryan was playing a game where catching a fish in the basket adds 10 points to his score. If he catches an octopus instead, he loses 5 points. What is his total if he catches 3 fish and 5 octopus? (AO1)
21. While revising her studies, Rani tries to verify that $a \times (b + c) = a \times b + a \times c$, taking $a = 5$, $b = -4$ and $c = 3$. What will be her steps in verifying this property? (AO2)
22. In a game, Tina scored 20, -40, 15 points while Meera scored 15, -15, -10 points. While waiting for the results, Tina tells Meera that she scored 5 more points than her and hence she would be declared the winner. Is Tina correct? Justify your answer. (AO2)

5 MARK QUESTIONS

23. An air conditioner (AC) cools a room by $4^\circ\text{C}/\text{min}$. The temperature of the room is 45°C before the air conditioner is turned on.
- a) What will be the temperature after the air conditioner has been on for 5 minutes? (AO1)
- b) How long should the AC be turned on so that the temperature reaches 17°C ? (AO2)
- c) After how many minutes will the temperature reach a negative value? (AO2)
24. A shopkeeper earns a profit of Re 1 by selling one pen and incurs a loss of 40 paise per pencil while selling pencils of her old stock.
- i) Represent her profit or loss in the form of integers. (AO1)
- ii) In a particular month, she sells 30 pens and 50 pencils. What is her overall profit or loss? (AO2)
- iii) In the next month, she earns neither profit nor loss. If she sold 70 pens, how many pencils did she sell? (AO2)
25. Observe the table of integers a and b , and answer the following. (AO1)



a	b
9	1
3	5
0	-3
-4	-6

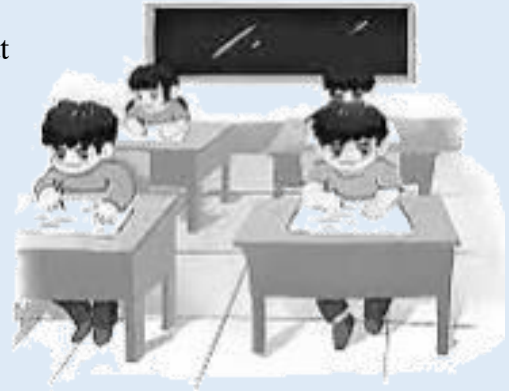
- a) Write 3 pairs of integers (a, b) whose product is less than 8.

- b) Write 2 pairs of integers (a, b) whose quotient is not an integer.

CASE BASED QUESTIONS (4 MARKS EACH)

26. In a class test, + 3 marks are awarded for every correct answer and (−1) mark is given for every incorrect answer.

- i) Akash gets 8 correct and 2 incorrect answers. What is his score? (AO1)
- ii) Arjun got 7 correct answers and his final score was 18. How many incorrect answers were there? (AO1)
- iii) How much more mark did Riya get than Akash if Riya had 9 correct answers and 1 incorrect answer? (AO2)



27. A textile shop gets a profit of Rs 5 each on selling branded shirts and incurs a loss of Rs 2 each on selling non-branded shirts.

- i) What profit is obtained on a sale of 500 branded shirts? (AO1)
- ii) What loss is incurred on selling 250 non-branded shirts? (AO1)
- iii) In a month, 200 non-branded shirts are sold. How many branded shirts must be sold so as to have neither profit nor loss in that particular month? (AO2)



28. Amar and Amulya visited two places, A and B, respectively, in the city of Kashmir and recorded the minimum temperatures on a particular day as $(-4)^{\circ}\text{C}$ at A and $(-1)^{\circ}\text{C}$ at B.

Based on this information, which of the following given statement is true?

- a) Which place is cooler? (AO1)
- b) What is the difference in temperatures of places A and B? (AO1)
- c) Amar argued that temperature of place B is 5°C more than that of place A. Amulya disagrees. Who is correct here? Justify. (AO2)



29. In a quiz, team A scored (-4) , 10 and 0 , team B scored 10 , (-2) and (-8) and team C scored (-2) , 12 and (-1) in three successive rounds.

- i) What is the total score of
 a) team A b) team B ? (AO1)
 ii) Find the total score of team C . How much more did Team C score than Team A ? (AO1)

iii) Who is the winner of the quiz? (AO1)

30. A multistorey building has 10 floors above the ground level, each of height 5 m . It also has 3 floors (each of height 5 m) below the ground level as Basement levels 1,2 and 3 starting from the ground level . A lift in the building moves at the rate of 1 m/sec.

i) What is the distance from ground level to Basement level 2? (AO1)

ii) How much time will it take for the lift to move from the topmost floor of the building to reach the ground level ? (AO1)

iii) If a man starts from 40 m above the ground level , what distance does he cover in reaching the floor of Basement 3 ? How long will it take him to reach the floor of Basement 3, through the lift ? (AO2)



SOLUTIONS OF CHAPTER - 1: INTEGERS

MULTIPLE CHOICE QUESTIONS

- | | | | |
|----------------------|---------------------|-------------------------|--|
| 1. (b) -5×3 | 2. (d) Distributive | 3. (b) $(-4) \times 25$ | 4. (d) -5°C to 5°C |
| 5. (b) $-5 + 1 = 4$ | 6. (d) 40 | 7. (b) ₹ 180 | 8. (d) $0 \div 7 = 0$ |

ASSERTION REASON QUESTIONS :

- | | | | |
|--------|---------|---------|---------|
| 9. (a) | 10. (c) | 11. (a) | 12. (d) |
|--------|---------|---------|---------|

2 MARK QUESTIONS

13. $a \div (-1) = -a$; $(-a) \div (-a) = 1$; $1 \div a =$ not an integer ; $a \div 1 = a$
 14. correct representation : 3 times (-2)
 15. $150 \times 4 = \text{Rs } 600$
 16. a) 3 b) 230
 17. a) false b) true

3 MARK QUESTIONS

18. a) positive b) negative c) positive
 19. $300/10 = 30$ min

20. $(3 \times 10) - (5 \times 5) = 5$ points

21. $a \times (b + c) = 5 \times (-4 + 3) = 5 \times -1 = -5$

$a \times b + a \times c = (5 \times -4) + (5 \times 3) = (-20) + 15 = -5$

Equal. Hence verified

22. Tina's score = $20 + -40 + 15 = -5$

Meera's score = $15 + -15 + -10 = -10$

Yes, Tina is correct as $-5 > -10$ and she scored 5 more points than Meera

5 MARK QUESTIONS

23. a) 25°C b) 7 min c) 12 min

24. i) $+1, -0.40$

ii) $(30 \times 1) - (50 \times 0.4) = \text{Rs } 10$ profit

iii) $70 \times 1 = 70, 70/0.4 = 175$ pencils

25. a) $(3,1), (0,1), (0,5), (-4,1)$ etc...any 3

b) $(9,5), (3,5), (-4,-3), (9,-6)$ etc ...any 2

4 MARK QUESTIONS

26. i) $(8 \times 3) + (2 \times -1) = 22$

ii) 3 incorrect ans

iii) Riya got $(9 \times 3) + (1 \times -1) = 26$

$26 - 22 = 4$ marks more than Akash

27. i) $500 \times 5 = \text{Rs } 2500$ ii) $250 \times 2 = \text{Rs } 500$ iii) $(200 \times 2) / 5 = 80$

28. a) place A

b) 3°C

c) Amulya is correct as $(-4)^{\circ}\text{C} + 3^{\circ}\text{C} = -1^{\circ}\text{C}$

29. i) a) 6 points b) 0 points

ii) Team C = 9 points ; 3 points more than team A

iii) Team C

30. i) 10 m

ii) 50 sec

iii) 55m, 55 sec

CHAPTER - 2: FRACTIONS AND DECIMALS

MULTIPLE CHOICE QUESTIONS

Q1. The decimal expression for 8 rupees 8 Paise (in rupees) is (AO2)

- a) 8.8 b) 8.08 c) 8.008 d) 88.0

Q2. A milkman sells 42 litres of milk at rupees 25.50 per litre to a hotel. How much money will he get from them? (AO1)

- a) ₹ 1,071 b) ₹ 1,050 c) ₹ 1,775 d) ₹ 1,070

Q3. Which of the following will be equal to $\frac{1}{4}$? (AO2)

- a) One hundredth of 250 b) 50% of 5 c) 100% of 0.25 d) 140% of 1

Q4. Shalini has two numbers, the product of these two numbers is

$\frac{28}{81}$, if one number is $\frac{14}{27}$ find the other number. (AO2)

- a) $\frac{1}{3}$ b) $\frac{1}{4}$ c) $\frac{2}{3}$ d) $\frac{2}{4}$

Q5. Rakesh bought a new bike. He went on a road trip of 165.9 km on bike. After a week he went for another trip of 102.04 km. What will be the riding on meter reader of the bike? (AO1)

- a) 63.86 km b) 280 km c) 267.94 km d) none of these

Q6. What decimal of an hour is a second? (AO2)

- a) 0.016 b) 0.00027 c) 0.00543 d) none of these

Q7. Which of the following is an improper fraction? (AO1)

- a) $\frac{2}{9}$ b) $\frac{7}{13}$ c) $\frac{9}{5}$ d) $\frac{1}{17}$

Q8. $0.99 \div 1.1$ is equal to (AO1)

- a) 0.009 b) 0.091 c) 0.9 d) none of these

ASSERTION REASON QUESTIONS

Choose the correct option from the following.

- (a) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Q9. Assertion: $\frac{9}{4}$ is an improper fraction (AO1)

Reason: An improper fraction is a fraction whose numerator is greater than or equal to its denominator.

Q10. Assertion: $0.2 \times 100 = 20$. (AO1)

Reason: To multiply a decimal number by 100, shift the decimal point to the left by 2 places.

Q11. Assertion: $2/3 \times 3/2 = 1$. (AO2)

Reason: When the product of two fractions is unity, each is called the reciprocal of the other.

Q12. Assertion: $45.25 + 24.025 = 45.250 + 24.025 = 69.275$ (AO2)

Reason: To add unlike decimals, convert them into like decimals

2 MARKS QUESTIONS

Q13. Ramesh wants to find the area of the black board in his classroom, he measures the length and breadth of the board and find that length is 105.20 cm & breadth is 90 cm. What is the area of the black board?

(AO1)

Q14. A square is divided into a certain number of equal parts. If 16 of these parts represent the fraction $1/4$, find the total number of parts into which the square has been divided. (AO2)

Q15. By what number should $\frac{1}{2}$ be divided by to get $\frac{2}{3}$? (AO1)

Q16. Nazima gave $2\frac{3}{4}$ litres out of the $5\frac{1}{2}$ litres of juice she purchased to her friends.

How many litres of juice is left with her? (AO2)

Q17. Write the following fractions with denominator 44 (AO1)

i) $\frac{3}{4}$ ii) $\frac{7}{2}$

3 MARKS QUESTIONS

Q18. Lucile collects U.S. stamps and a foreign stamp. $\frac{1}{4}$ of them are foreign stamps. She divides the U.S. stamps equally between two friends, Michelle and Nadia. If Lucile has 72 U.S. and foreign stamps altogether, how many stamps does Nadia receive from Lucile? (AO2)

Q19. What should be added to 5.74 to get 6? (AO2)

Q20. Arrange the following fractions in ascending order (AO2)

$\frac{3}{8}, \frac{5}{6}, \frac{2}{4}, \frac{1}{3}$

Q21. Simplify: $(5\frac{1}{3} \times 5\frac{1}{4}) - (\frac{1}{6} \times 1\frac{1}{2})$ (AO1)

Q22. If $\frac{2}{5}$ of a number is 10, then what is $\frac{7}{4}$ of that number? (AO2)

5 MARKS QUESTIONS

Q23. Lilian has a part time job. Each month, she spends $\frac{1}{3}$ of her earning on clothes, saves $\frac{3}{8}$ of the remainder, and spends the rest of earning on food.

What fraction of her earnings does she spends on food? (AO2) - 3 marks

If she earns Rs. 540, how much does she spend on food each month? (AO2) - 2 marks

Q24. In a society, there were 100 members. Each member has to participate in some activity like art, basketball, cricket and football. $\frac{3}{10}$ of the members participated in art, $\frac{1}{10}$ in basketball and 17 played cricket. How many members participated in football? (AO2)

Q25. A farmer divided his property between his daughter and three sons. He gave half of his property to his daughter, $\frac{1}{4}$ of his property to his eldest son, $\frac{1}{8}$ of his property to his second son, and remaining part of his property was given to the youngest son.

a) What fraction of his property was given to the youngest son? (AO2)

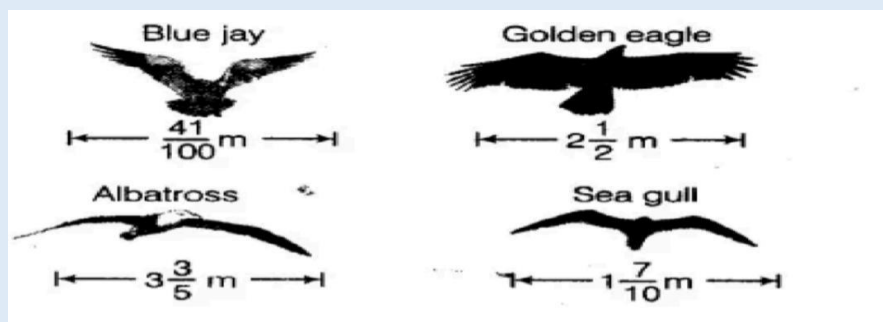
b) If the farmer had 32 acres of land as his whole property, how many acres of land did the youngest son get? (AO1)

c) How much acres of land his eldest son will get? (AO1)

d) How much acres of land his daughter will get? (AO1)

CASE STUDY BASED QUESTIONS (4 MARKS EACH)

Q26. The birds Blue Jay, Golden Eagle, Albatross & Sea Gull are some dangerous hunters with powerful wings. The wandering Albatross has the largest & most powerful wingspan among all the living birds. It is the only bird that can fly 10,000 miles without landing. The Golden Eagle is one of the best-known birds of prey in the Northern Hemisphere. Seagulls are sea birds of the Laridae family in the suborder Lari. Blue Jay is a passerine bird in the family of Corvidae, native to North America. The diagram shows the length of wingspans (approx. in metre) of these species of birds



i) Which bird has the smallest wingspan?(AO1) - 2 marks

ii) Which bird has the longest wingspan? What will be one fifth of the length of wingspan of this bird? (AO2) - 2 marks

Q27. Four friends had a competition to see how far they could hop on one foot. The table given show the distance covered by each.

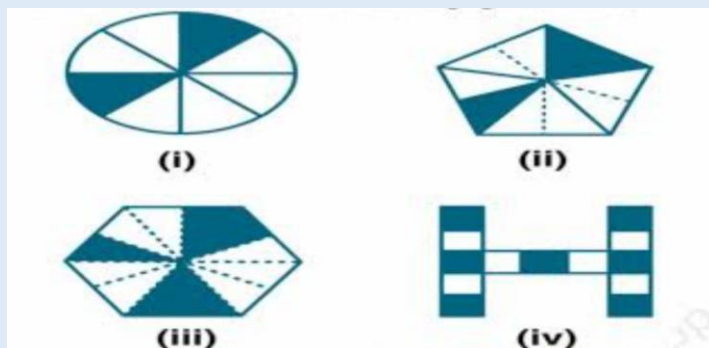
Name	Distance covered (km)
Seema	$\frac{1}{20}$
Nancy	$\frac{1}{40}$
Megha	$\frac{1}{32}$
Soni	$\frac{1}{25}$

- (a) How farther did Soni hop than Nancy? (AO2) - 1 mark
 (b) What is the total distance covered by Seema and Megha?(AO1) - 2 mark
 (c) Who walked farther, Nancy or Megha?(AO1) - 1 mark

Q28. Hitakshi is in class VI. She had 24 pencils. She gave 8 pencils to her sister Meenakshi and 6 pencils to her brother Lakshay. She gave remaining to her mother.

- a) What fraction of pencils did she give to Meenakshi? (1 mark) (AO1)
 b) What fraction of pencils did she give to her mother? (2 Mark) (AO2)
 c) What fraction of pencils did she give to her brother? (1 mark) (AO1)

Q29. What fraction of each of the following figure is shaded? (AO1)



Q30. Karan, an electrician, undertook the wiring job of a building. He bought $8\frac{1}{3}$ m bundles of an electric cable. Each bundle had $184\frac{4}{5}$ m of cable.



- a) Find the total length of the cable bought by Karan. (AO1)
- b) If the cost of the cable is ₹ $7\frac{3}{4}$ per metre, find the amount paid by Karan.(AO1)
- c) Karan cut a length of $13\frac{4}{5}$ m from a bundle and divided the remaining cable of this bundle into pieces of length 19 m each. How many pieces of 19 m did he get?(AO2)

SOLUTIONS OF CHAPTERS - 2: FRACTIONS AND DECIMALS

Q1. b

Q2. a

Q3. c

Q4. c

Q5. c

Q6. b

Q7. c

Q8. C

ASSERTION REASON QUESTIONS

Q9. a

Q10. c

Q11. a

Q12. A

2 MARKS QUESTIONS

Q13. Area of Rectangle = $l \times b$

$$\Rightarrow 105.20 \times 90 = 9,468 \text{ cm}^2$$

Q14. Let the square be divided in x equal parts.

Then according to the question $\frac{16}{x} = \frac{1}{4}$

By cross multiplication $x = 16 \times 4 = 64$ parts

Q15. Let the number be x

then $\frac{1}{2} \div x = \frac{2}{3}$

$$\Rightarrow \frac{1}{2} \times \frac{1}{x} = \frac{2}{3}$$

$$\Rightarrow x = \frac{3}{4}$$

Q16. The quantity of juice left with her = $5\frac{1}{2} - 2\frac{3}{4} = \frac{11}{2} - \frac{11}{4}$
 $\Rightarrow \frac{22-11}{4} = \frac{11}{4} = 2\frac{3}{4}$ litres

Q17. i) By multiplying numerator and denominator with 11

$$\frac{3}{4} = \frac{3 \times 11}{4 \times 11} = \frac{33}{44}$$

ii) By multiplying numerator and denominator with 22

$$\frac{7}{2} = \frac{7 \times 22}{2 \times 22} = \frac{154}{44}$$

3 MARKS QUESTIONS

Q18. According to the question

$$\text{No. of foreign stamps} = \frac{1}{4} \text{ of } 72 = \frac{1}{4} \times 72 = 18 \text{ stamps}$$

$$\text{Therefore U.S. stamps} = 72 - 18 = 54 \text{ stamps}$$

Now, Lucile divides 54 U.S. stamps equally between her sisters

$$\text{Therefore, Nadia will receive} = \frac{54}{2} = 27 \text{ stamps}$$

Q19. Let the required no be x

$$\text{Then, } 5.74 + x = 6$$

$$\Rightarrow x = 6 - 5.74$$

$$\Rightarrow x = 0.26$$

Q20. LCM of all the denominators is 24

Making all the denominators equal to their LCM

$$\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24}, \quad \frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24}, \quad \frac{2}{4} = \frac{2 \times 6}{4 \times 6} = \frac{12}{24}, \quad \frac{1}{3} = \frac{1 \times 8}{3 \times 8} = \frac{8}{24}$$

Now comparing the fractions, we get

$$\frac{8}{24} < \frac{9}{24} < \frac{12}{24} < \frac{20}{24} \quad \text{therefore ascending order will be } \frac{1}{3} < \frac{3}{8} < \frac{2}{4} < \frac{5}{6}$$

Q21. $(5\frac{1}{3} \times 5\frac{1}{4}) - (\frac{1}{6} \times 1\frac{1}{2}) = (\frac{16}{3} \times \frac{21}{4}) - (\frac{1}{6} \times \frac{3}{2})$

$$\Rightarrow (4 \times 7) - \frac{1}{4} = 28 - \frac{1}{4} = \frac{111}{4} = 27\frac{3}{4}$$

Q22. Let the number be x

$$\text{then, } \frac{2}{5} \times x = 10 \Rightarrow x = 25$$

$$\text{so, } \frac{7}{4} \text{ of } 25 = \frac{7}{4} \times 25 = 43.75$$

5 MARKS QUESTIONS

Q23. a) Let her earning be x

$$\text{She spends on cloths} = \frac{1}{3} \text{ of } x = \frac{1}{3}x$$

$$\text{Remainder} = x - \frac{1}{3}x = \frac{2}{3}x$$

$$\text{According to the question her saving} = \frac{3}{8} \times \frac{2}{3}x = \frac{1}{4}x$$

$$\text{Therefore, she spends on food} = x - \left(\frac{1}{3}x + \frac{1}{4}x \right)$$

$$\Rightarrow x - \frac{7}{12}x = \frac{5}{12}x$$

Hence, she spends on food $\frac{5}{12}$ of her earning

$$\text{she spends on food} = \frac{5}{12} \times 540 = \text{Rs. } 225$$

$$\text{Q24. No. of members participated in art} = \frac{3}{10} \times 100 = 30$$

$$\text{No. of members participated in basketball} = \frac{1}{10} \times 100 = 10$$

$$\text{No. of members participated in cricket} = 17$$

$$\text{Therefore, No. of members participated in football} = 100 - (30+10+17)$$

$$\Rightarrow 100 - 57 = 43 \text{ members}$$

Q25. a) Let the total property of farmer be 1

$$\text{Also, property given to farmer's daughter} = \frac{1}{2}$$

$$\text{Property given to eldest son} = \frac{1}{4}$$

$$\text{Property given to second son} = \frac{1}{8}$$

Therefore, the property given to farmer's youngest son =

$$\text{Total property of farmer} - \text{total property given to his three children}$$

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

$$= 1 - \frac{7}{8} = \frac{1}{8}$$

b) Since, total property of farmer = 32 acres

So, property gained by youngest son = $1/8 \times 32 = 4$ acres

c) Property gained by eldest son = $1/4 \times 32 = 8$ acres

d) Property gained by his daughter = $1/2 \times 32 = 16$ acres

CASE STUDY BASED QUESTIONS (4 MARKS EACH)

Q26. i) Blue Jay

ii) Albatross, one fifth of the length of wingspan = $\frac{18}{5} \times \frac{1}{5} = \frac{18}{25} m$

Q27. I) Soni hop than Nancy = $\frac{1}{25} - \frac{1}{40} = \frac{3}{200} km$

ii) Total distance covered by Seema and Megha = $\frac{1}{20} + \frac{1}{32} = \frac{13}{160} km$

iii) Since $\frac{1}{32} > \frac{1}{40}$, so Megha walked further

Q28. a) Fraction of pencils she gave to Meenakshi = $\frac{8}{24} = \frac{1}{3}$

b) No of pencils she gave to her mother = $24 - (8+6)$
 $= 24 - 14 = 10$

Therefore, fraction of pencils she gave to her mother = $\frac{10}{24} = \frac{5}{12}$

a) fraction of pencils she gave to her brother = $\frac{6}{24} = \frac{1}{4}$

Q29. i) $\frac{2}{8}$ ii) $\frac{2}{9}$ iii) $\frac{3}{10}$ iv) $\frac{7}{13}$

Q30. a) Total length of the cable bought by Karan = $184 \frac{4}{5} \times 8 \frac{1}{3} = \frac{25}{3} \times \frac{924}{5}$
 $= 1540 m$

b) Amount paid by Karan = total length of the cable \times cost per meter

$$= 1540 \times 7 \frac{3}{4} = ₹11935$$

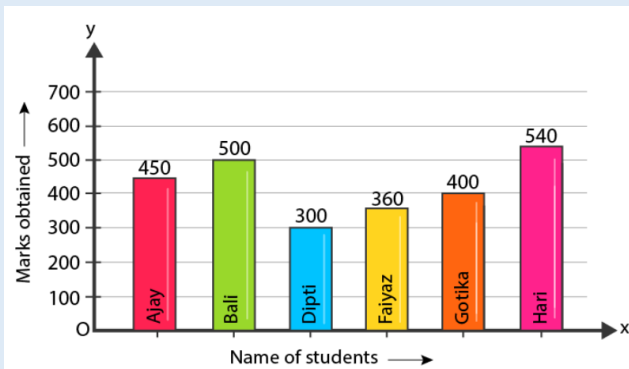
c) After cutting remaining cable of the bundle = $\frac{924}{5} - \frac{69}{5} = \frac{855}{5} = 171 m$

Therefore, no. of pieces of 19 m = $\frac{171}{9} = 9 pices$

CHAPTER – 3: DATA HANDLING

MULTIPLE CHOICE QUESTIONS

- The heights of ten boys were measured in cm, and then the results are given as follows:
(AO1)
160, 150, 158, 162, 140, 151, 156, 149, 143 and 141.
What is the height found of the tallest boy?
A) 158 B) 162 C) 156 D) 160
- Identify the mode for the following data set: (AO2)
21, 19, 62, 21, 66, 28, 66, 48, 79, 59, 28, 62, 63, 63, 48, 66, 59, 66, 94, 79, 19
A) 21 B) 66 C) 48 D) 79
- Ankita plays for 6 hours , 10 hours and 8 hours respectively on three consecutive days .
how many hours does she play daily on average? (AO1)
A) 8 hours B) 7 hours C) 6 hours D) 9 hours
- The difference between the highest and the smallest observations in a given data is called
(AO1)
A) Frequency B) Data C) Range D) Mean
- The mode of a set of observations is the value which (AO1)
A) occurs more often B) is central
C) is between maximum and minimum D) None of these
- Let x , y z and w be four observations. The mean of these observations is (AO1)
A) $\frac{x \times y \times z \times w}{4}$ B) $\frac{x+y+z+w}{4}$ C) $\frac{x+y+z}{4}$ D) $\frac{x \times y + z \times w}{4}$
- Which measure of central tendency best represent the data of the most popular politician
after a debate ? (AO2)
A) Mean B) Median C) Mode D) Any of these
- The bar graph below is showing the marks obtained by 6 students Ajay , Bali , Dipti ,
Faiyaz , Gotika and Hari .



Which student has scored maximum marks ? (AO1)

- A) Ajay B) Bali C) Hari D)Gotika

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following .

(A) Both assertion (A) and reason(R) are true and reason (R)is the correct explanation of assertion (A).

(B) Both assertion (A) and reason(R) are true but reason (R)is not the correct explanation of assertion(A)

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

9. Assertion (A) : $\text{Mean} = \frac{14+16+18+20+22}{5} = \frac{90}{5} = 18$.

Reason (R) : Mean is the sum of all observations divided by number of observation. (AO1)

10. Assertion (A) : The range of the following data 14 , 16, 20, 26, 38, 12, 15 is $38 - 12 = 26$.

Reason (R) : The difference between the highest and the lowest observation in a data is called its range . (AO2)

11. Assertion (A) : The mode is always one of the number in data .

Reason (R) : Mode is data is always greater than mean in a data. (AO2)

12. Assertion (A) : When a given data is arranged in ascending or descending order , then the middle most observation is called the median of the data.

Reason (R) : Marks obtained by seven students in a class are 18, 21,21,22,32,36,70. Then the median is 36.

2 MARKS QUESTIONS

13. The scores in maths test of 15 students are as follows : (AO2)

9,25,10,20,9,20,20,10,5,15,25,20,20,15,20

Find the median of the data .

14. Find the mean of the first 10 odd positive integers. (AO2)
15. Find the range and mode of the following weights (in kg) of seven students of class VII .
35,37,38,39,37,39,40

16. A mobile seller collects the following data of mobiles sold in her shop

Brands of mobiles	Number of mobiles sold
Samsung	58
Oppo	55
Redmi	48
Iphone	45
Realme	56

- I. Which brand of the mobile is most liked ? (AO1)
- II. Which measure of central tendency was used in (I)?(AO2)
17. The ages of 7 members of a family are as follows
10,25,30,60,52,15,80.
What is the age of oldest family member and that of the youngest member. (AO1)

3 MARKS QUESTIONS

18. Observe the data and answer the following questions

16, 15,16,17,10,16,15,17.

- a) Which value can be put in the data , so that the mode remain the same ? (AO2)
- b) At least how many and which value must be put into, to change the mode to 15? (AO2)
- c) What is the least number of values that must be taken out, to change the mode to 17? (AO2)
19. Fifty students of class VII were asked to name their favourite place to which they want to visit in summer vacation. The result are shown in the following table. Represent the given data on bar graph. (AO2)

Favourite Place	Goa	Kashmir	Jaipur	Mumbai	Ooty
Number of Students	10	6	12	8	14

20. Find one numbers between $\frac{1}{3}$ and $\frac{1}{6}$. (AO2)
21. If the arithmetic mean of 45, 48, 50, 35, P and 50 is 45, then find the value of P. (AO2)
22. The weight (in kg) of 15boys of a class are 40,44,33,35,43,48,30,41,41,38,40,41,40,45,36
- i) Find the mode and median of the data.
- ii) Is there more than one mode?

5 MARKS QUESTIONS

23. Sale of Mathematics and Hindi books in the years 2020, 2021, 2022 and 2023 are given below.

Years	1999	2000	2001	2003
Mathematics	450	400	410	540
Hindi	490	480	540	610

Draw the double bar graph and answer the following questions

1. In which year was the difference in the sale of the two subjects books least? (AO2)
2. The demand of which book rose faster from 1999 to 2002? (AO2)

24. The height of 10 girls were measured (in cms) and the results are as follows

135,150,139,128,151,132,146,149,143,141.

- i) What is the height of the tallest girl? (AO1)
- ii) What is the height of the shortest girl? (AO1)
- iii) What is the range of the data? (AO2)
- iv) What is the mean height of the girls? (AO2)
- v) How many girls have heights more than the mean heights? (AO1)

25. The performance of the student in first and second term is given below.

Subject	English	Hindi	Mathematics	Social science	Science
1 st term max marks 100	67	72	8	73	8
2 nd term max marks 100	70	65	95	75	85

Draw the double bar graph choosing appropriate scale and answer the following question (AO2)

- a) In which subject the student improve his performance most? (AO2)
- b) In which subject is the student improve the least? (AO1)
- c) Has the performance gone down in any subject? (AO1)

26. Rahul scored of 97, 73 and 80 respectively in his first three examination.

If he scored 70 in the fourth examination, then find how much average score

increased/decreased? (AO2)

CASE STUDY QUESTIONS (4 MARKS EACH)

27. Abhishek, Class VII student received cash award of Rs. 5000 in the Dance competition. His father advised him to make a budget plan for spending this amount. He made the following plan:

S. No.	Head	Amount
1	Donation in temple	150
2	Tuition fee to needy child	200
3	Welfare of senior citizens	300
4	Welfare of street children	300
5.	Saving in bank	1500
6	Books for family library	500
7	Picnic for family	650
8	Gift to grand parents	600
9	Tea party to friends	800
Total		5000

Make a bar graph for the above data, and give following answers (AO2)

- a. Find the mode and median of the above distribution of money. (AO1)
- b. Which values are depicted in his plan? (AO2)

28. Below is a list of 10 tallest buildings in India .This list ranks buildings in India that stand at least 150m(492ft)tall, based on standard height measurement. This includes spires and architectural details but does not include antenna marks. Followings data is given as per the available information till 2009.Since, new buildings are always under construction, go online to check new taller buildings.

Use the information given in the table about skyscrapers to answer the following questions

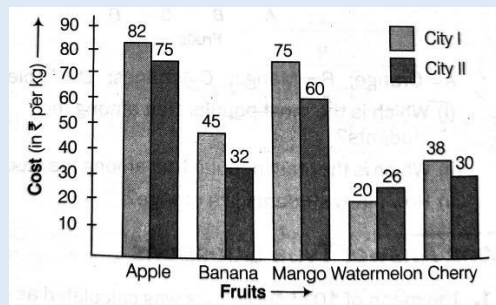
Planet	MUMBAI	181M	51	2009
UB Towers	BANGLORE	184M	20	2006
Ashok Towers	MUMBAI	193M	49	2009
The Imperial I	MUMBAI	249M	60	2009
The Imperial II	MUMBAI	249M	60	2009
RNA Mirage	MUMBAI	180M	40	2009

Oberoi Woods Tower I	MUMBAI	170M	40	2009
Oberoi Woods Tower II	MUMBAI	170M	40	2009
Oberoi Woods Tower III	MUMBAI	170M	40	2009
MVRDC	MUMBAI	156M	35	2002

- i) Draw a bar graph for given data. (AO2)
- ii) Which city in this list has the largest percentage of skyscrapers? What is the percentage? (AO2)

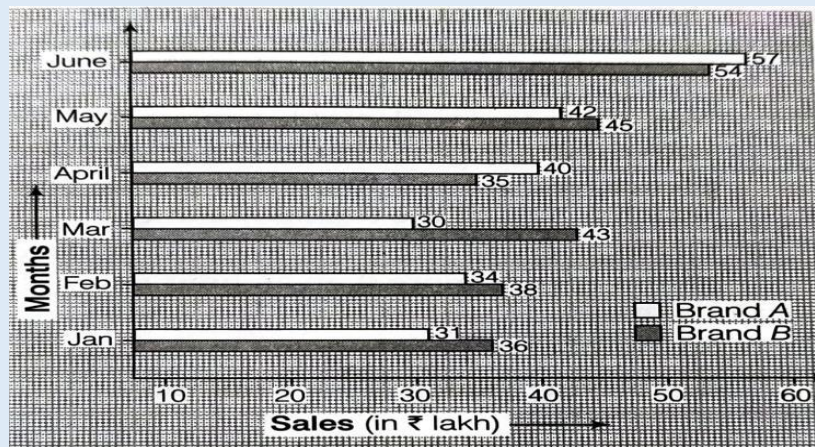
iii) What is the range of the data? (AO1)

29. Study the double bar graph given below and answer the questions that follow:



- i) What information does the above double graph depict? (AO2)
- ii) Name the fruits for which cost of 1kg is greater in City I as compared to City II. (AO1)
- iii) What is the difference of rates for apples in both the cities? (AO2)

30. Study the double bar graph shown below and answer the questions that follow



- i) What information is represented by the above double bar graph? (AO2)

- ii) In which month, sales of brand A decreased as compared to the previous month? (AO2)
- iii) What is the difference in sales of both the brands for the month of June? (AO2)

SOLUTIONS OF CHAPTER – 3: DATA HANDLING

MULTIPLE CHOICE QUESTIONS

1. B
2. B
3. A
4. C
5. A
6. B
7. C
8. C

ASSERTION AND REASON QUESTIONS

9. A
10. A
11. C
12. C

2 MARKS QUESTIONS

13. On arranging the marks in order, we get
5,9,9,10,10,15,15,20,20,20,20,20,25,25
In the ascending order, the middle value of data is 20.
∴ Median = 20.
14. First ten odd positive numbers are 1,3,5,7,9,11,13,15,17,19
$$\text{Mean} = \frac{\text{Sum of all observation}}{\text{Total number of observation}} = \frac{1+3+5+7+9+11+13+15+17+19}{10} = 10$$

So the mean is 10.
15. Range of the given data : Highest value – Lowest Value = 40 – 35 = 5
And 37 occurred maximum number of times i.e., 3
So mode of the observation is 37.
16. I) Samsung mobile
II) We can use any of three method mean, median and mode.
17. From the given data the age of the oldest family member is 80 and the age of the youngest family member is 10

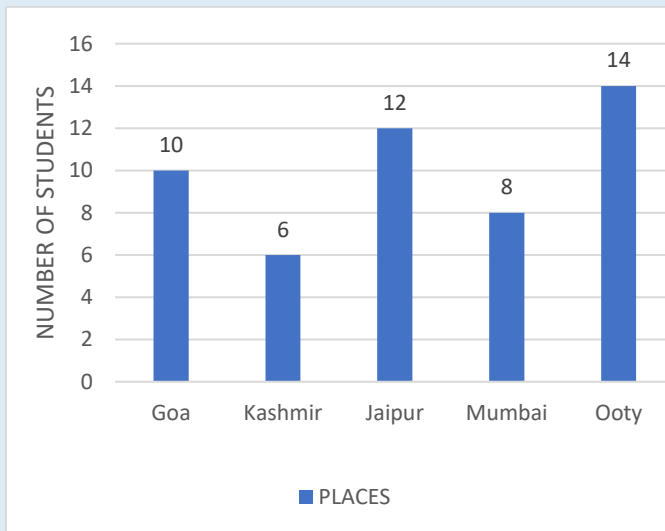
3 MARKS QUESTIONS

18. Solution :

- As per the given data, 16 is the mode of data, since it has highest frequency i.e., 3. Now , if 15 and 17 is added then the mode will get changed to 15 , 16 and 17, whereas if 8, 10 or 16 is added then the mode will remain same .
- At least two 15's should be added to change the mode to 15. On adding two 15's , the frequency of 15 will be maximum i.e.,4.
- We will have to take at least two 16's and one 15 to change the mode 17.

19. The bar graph is:

Scale 1 unit = 2 students



20. Given numbers are $\frac{1}{3}$ and $\frac{1}{6}$.

We know that mean of two numbers always lies between them.

So, first number lying between $\frac{1}{3}$ and $\frac{1}{6}$ can be found by calculating mean of $\frac{1}{3}$ and $\frac{1}{6}$.

$$\text{Mean} = \frac{\text{Sum of all observations}}{\text{Total No. of observations}} = \frac{\frac{1}{3} + \frac{1}{6}}{2} = \frac{\frac{2}{6} + \frac{1}{6}}{2} = \frac{\frac{3}{6}}{2} = \frac{1}{4}$$

$$\text{So, } \frac{1}{3} < \frac{1}{4} < \frac{1}{6}.$$

21. Given the mean of 45 , 48 , 50 , 35 , P and 50 is 45

$$\text{So Mean} = \frac{\text{Sum of all observations}}{\text{Total No. of observations}} = \frac{45+48+50+35+P+50}{6} = \frac{228+P}{6} = 45$$

$$228 + P = 45 \times 6$$

$$P = 270 - 228 = 42$$

So the value of p is 42.

22. i) Arrange the following data (in kg) in ascending order ,

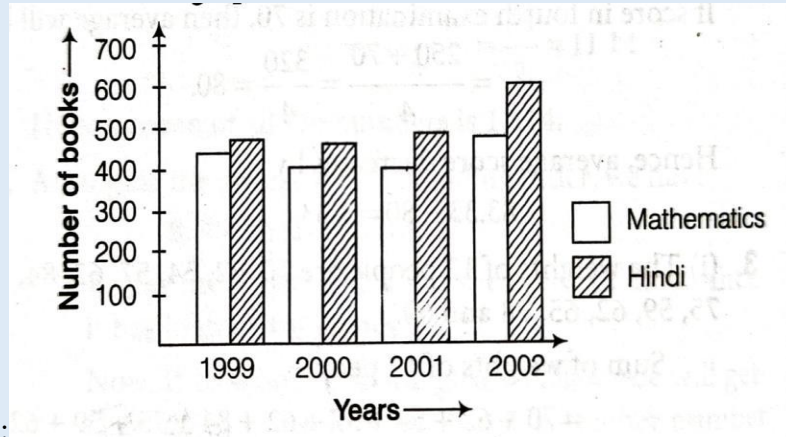
We get 30,33,35,36,38,40,40,40,41,41,41,43,44,45,48.

Here, 40 and 41 occurs more frequently i.e., 3 times

So mode is 40 and 41.
 The Value of the middle observation is 40.
 So median is 40.
 ii) Yes, there are two mode i.e., 40 and 41.

5 MARKS QUESTIONS

23.



The Bar Graph is :

- i) The difference in the sales of the two subjects books
 In the year 1999, $490 - 450 = 40$
 In the year 2000, $480 - 400 = 80$
 In the year 2001, $540 - 410 = 130$
 In the year 2002, $610 - 540 = 70$
 The difference in the sale of the two subject books is least in year 2020.
- ii) The demand of mathematics subject book rose from 1999 to 2002 = $540 - 450 = 90$ books
 The demand of Hindi subject book rose from 1999 to 2002 = $610 - 490 = 120$ books
 So here $120 > 90$.
 So, the demand of Hindi Books rose faster than the mathematics books.

23.

On arranging the data in ascending order we get,

128,132,135,139,141,143,146,149,150,151

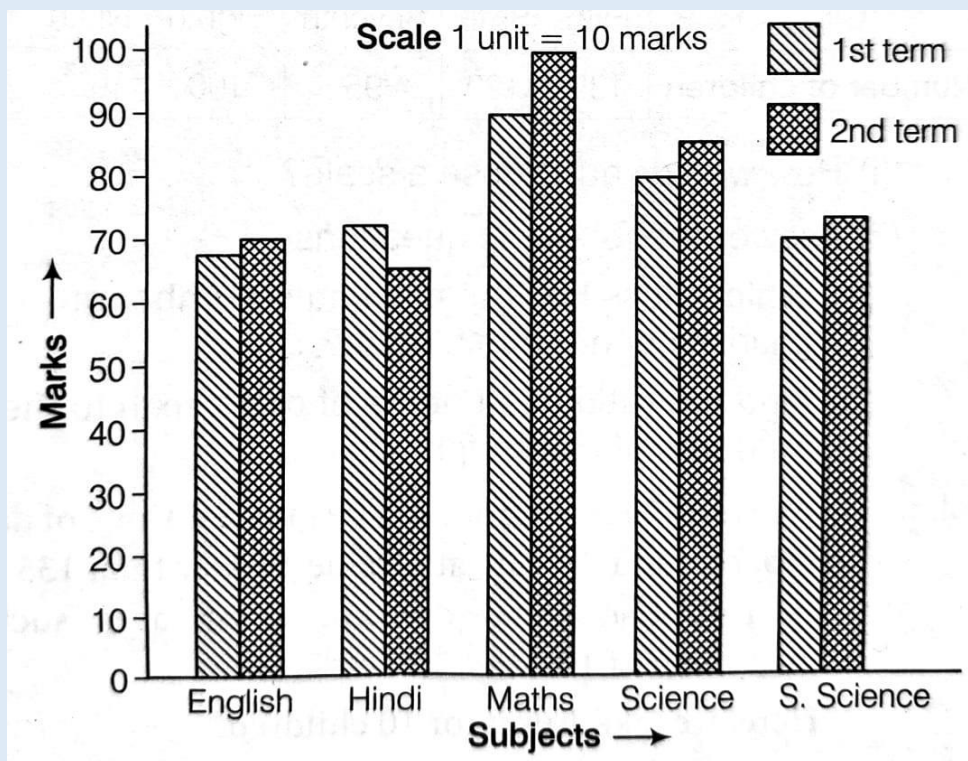
- i) The height of the tallest girl is 151 cm.
 ii) The height of the shortest girl is 128 cm.
 iii) The range of given data is $151 - 128 = 23$ cm.
 iv) Mean of the Height of the girls = Mean = $\frac{\text{Sum of all observations}}{\text{Total No. of observations}}$

$$= \frac{128+132+135+139+141+143+146+149+150+151}{10} =$$

141.4 cm

v) Five girls have height more than mean.

25. The Double Bar Graph Is:



- i) We have , marks increased in English = $70 - 67 = 3$
 Marks increased in Hindi = $65 - 72 = -7$
 Marks increased in Maths = $95 - 88 = 7$
 Marks increased in Science = $85 - 81 = 4$
 Marks increased in Social Science is = $75 - 73 = 2$
 Hence, the child improved his performance in maths the most i.e., 7 marks.
- ii) The child has improved his performance the least in social science i.e., 2 marks.
- iii) Yes, the performance has gone down in Hindi i.e., -7 marks.

26. Since, Rahul's scores in three examinations are 97, 73 and 80.

$$\text{Sum of three scores} = 97+73+80 = 250$$

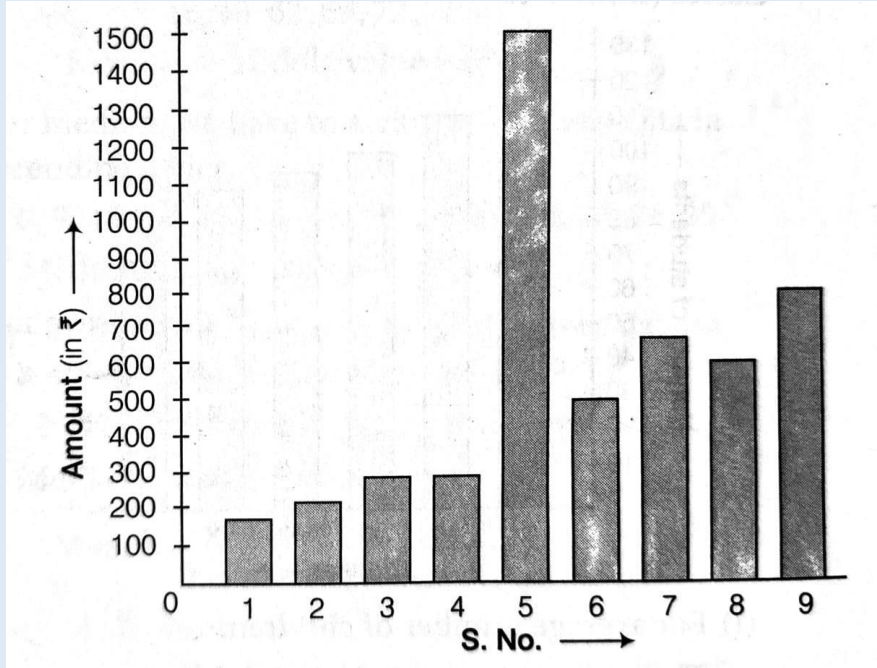
$$\text{Average of three scores} = 250 / 3 = 83.33$$

$$\text{IF score in fourth examination is 70, then the average will be} = \frac{250+70}{4} = \frac{320}{4} = 80$$

Hence the average score will be decreases by $83.33 - 80 = 3.33$.

CASE STUDY QUESTIONS (4 MARKS EACH)

27. The bar graph is

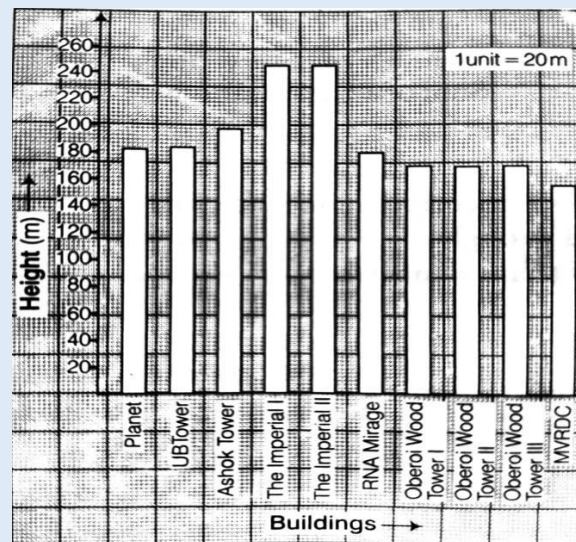


i) Mode = Highest frequency observation = 300

For median, we have to arrange the data in ascending order : 150 , 200 , 300 , 300 , 500 , 600 , 650 , 800 , 1500 . So median = 500.

ii) Value: He is very socialized student and also very kind towards his societies.

28. i)



ii) We can see from given data, Mumbai has maximum number of skyscrapers from the list given. It has 9 skyscrapers out of 10 buildings given.

Therefore, required percentage = $\frac{9}{10} \times 100 = 90\%$

iii) Range of data = Maximum Height – Minimum Height = 249 – 156 = 93 m

29. After the study of double bar graph,

Cost of apple in city I = 82

Cost of apple in city II = 75

Cost of banana in City I = 45

Cost of banana in City II = 32

Cost of mango in City I = 75

Cost of mango in City II = 60

Cost of water melon in City I = 20

Cost of water melon in City II = 26

Cost of cherry in city I = 38

Cost of cherry in City II = 30

i) Clearly the double bar graph compares the cost of different fruits per kg in city I and II

ii) Cost of apple in city I = 82, where in city II is = 75

Cost of banana in city I = 45, where in city II is = 32

Cost of mango in city I = 75, where in city II is = 60

Cost of cherry in city I = 38, where in city II is = 30

Hence Apple, Banana, Mango and Cheery prices/costing city I are greater than city

iii) Difference of rates for apples in cities I and II = 82 - 75 = Rs 7 per kg

30. i) The above double bar graph compares the sale of brands A and B during the months

January to June.

ii) We can clearly see from the double bar graph that sales for brand A reduced in the month of March compared to that of February.

iii) Sales of brand A in June = Rs 57 lakh and sales of Brands B in June = Rs 54 lakh

Difference in sales = 57 - 54 = Rs 3 lakhs

CHAPTER – 4: SIMPLE EQUATIONS

MULTIPLE CHOICE QUESTIONS

1. Write an equation for “Taking away 5 from x gives 10”. (AO1)
(a) $x - 10 = 5$ (b) $5 - x = 10$ (c) $10 - x = 5$ (d) $x - 5 = 10$
2. Use the sign of $>$, $<$ or $=$ in the box to make the statement true when $x = -1$. (AO2)
 $25 - 40x$ $25x - 40$
3. -1 is not a solution of which of the following equations? (AO2)
(a) $x + 1 = 0$ (b) $2y + 3 = 1$ (c) $2p + 7 = 5$ (d) $x - 1 = 2$
4. Which of the following statements is not true? (AO2)
(a) An equation remains the same if the LHS and the RHS are interchanged.
(b) The value of the variable when substituted in the equation makes LHS = RHS is called the solution of the equation.
(c) Solving an equation means finding the solution.
(d) If we do the same mathematical operation with same number on both sides of an equality, the equality will be disturbed.
5. 7 added to -7 gives: (AO1)
(a) 14 (b) -14 (c) 0 (d) -49
6. Divide 40 by one half and then add 5. What’s the answer? (AO2)
(a) 25 (b) 65 (c) 85 (d) 45
7. The solution of $x - 8 = 1$ is: (AO1)
(a) 8 (b) -9 (c) 9 (d) -8
8. If p and q are positive integers, then the solution of the equation
 $p x = q$, will always be: (AO2)
(a) a positive number (b) a negative number (c) 1 (d) 0

ASSERTION - REASON QUESTIONS

Choose the correct option from the following.

- (a) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

9. **Assertion:** $-7 - 2 = -9$ (AO1)

Reason: Sum of two negative integers is always negative.

10. **Assertion:** “Sunil wrote an equation as $\frac{m}{5} = 4$ ”.

Reason: One-fifth of m is 4.

11. **Assertion:** A teacher asks the students of her class to write an equation for the statement “Four times a

number y is 100”. Ravi wrote $4 + y = 100$

Reason: 4 times y is $4y$.

12. **Assertion:** The value of the variable in an equation for which the equation is satisfied is called the solution of the equation

Reason: The solution for the equation $2x - 3 = 5$ is $x = -4$

2 MARKS QUESTIONS

13. Find the value of y for which the expressions $(y-15)$ and $(2y + 1)$ become equal. (AO2)

14. Jose and Rose made 42 flowers. If Jose made x flowers, and Rose made 3 less than twice what Jose made, write an equation for this situation. (AO2)

15. When two numbers are added together, their sum is 46. One of the numbers is 6 greater than the other. What are the numbers? (AO1)

16. I am a number. I'm not an odd number. I'm greater than 90. I am not greater than 100. If you subtract me from 100, you get nothing. What number am I? (AO2)

17. If $a = 3$, $b = -2$, find the value of $-5a + 4b + 2$. (AO1)

3 MARKS QUESTIONS

18. If $k + 7 = 10$, find the value of $9k - 50$. (AO1)

19. The sum of three consecutive multiples of 2 is 18. Find the numbers. (AO1)

20. One – third of a number exceeds its one-fourth by 1. Find the number. (AO2)

21. Arul subtracts thrice the number of notebooks he has from 50. He finds the result to be 8. Find the number of notebooks with Arul? (AO2)

22. Jeny thinks of a number. Navya says that add 5 to 4 times the number which she thinks and asked the final answer. Jeny said that it is 65. What number did Jeny think of? (AO2)

5 MARKS QUESTIONS

23. Mahanth is 26 years younger than his father. His father is 2 years older than his mother. At the same time Mahanth's father is 25 years younger than his grandfather. The sum of all their ages is 125. Find the age of Mahanth, his father, his mother and his grandfather. (AO2)

24. The length of a rectangle is twice its breadth. If its perimeter is 60 m, find the length and breadth of the rectangle. (AO1)

25. A Police officer pulls over your older brother for speeding in a 35 km per hour zone. The officer gives him a ticket worth Rs.550 and tells him that there's a Rs.100 fine for every ticket in addition to Rs.50 extra for every 1 km per hour the speed limit. How fast was your brother going? (AO2)

CASE STUDY QUESTIONS (4 MARKS EACH)

26. The sum of two numbers is 60 and their difference is 30.

- i) If the smaller number is x , what is the other number? (AO1)
- ii) Find the difference between the two numbers in terms of x . (AO2)
- iii) Find the two numbers. (AO2)

27. Varshini has some marbles. Ameena has 10 more than Varshini. Raju says that he has 3 more marbles than the number of marbles Varshini has. Manish says that he has half of the marbles that Varshini and Ameena together have. Taking number of marbles Varshini has as ' x ', answer the following questions:

- a) How many marbles does Ameena have? (AO1)
- b) How many marbles does Raju have? (AO1)
- c) How many marbles does Manish have? (AO1)
- d) How many marbles does Manish and Raju together have? (AO2)

28. Sam and Gopi went to a stationery shop. They had purchased some stationery things. Sam bought 2 pens for Rs.60 and Gopi bought 4 pencils for Rs.20. They paid money according to the price list provided by the shopkeeper.

Answer the following questions.

- a) Write the algebraic expression of the purchase of Sam. (AO1)
- b) Write the algebraic expression for the purchase of Gopi. (AO1)
- c) Find the amount of money paid by Sam and Gopi, if the price of a pen is Rs.15 and price of a pencil is Rs 5. (AO2)



SOLUTIONS OF CHAPTER – 4: SIMPLE EQUATIONS

MULTIPLE CHOICE QUESTIONS

1. d)
2. >
3. d)
4. d)
5. c)
6. c)
7. c)
8. a)

ASSERTION - REASON QUESTIONS

9. a)
10. a)
11. d)
12. c)

2 MARKS QUESTIONS

13. $y - 15 = 2y + 1$

$$-y = 16$$

$$y = -16$$

14. $2x - 3 + x = 42$

$$3x - 3 = 42$$

$$3x - 45 = 0$$

15. $x + x + 6 = 46$

$$2x = 40$$

$$x = 20$$

One number is 20 and the other number is 26.

16. 100

17. $-5(3) + 4(-2) + 2 = -21$

3 MARKS QUESTIONS

18. $k + 7 = 10$

$$k = 3$$

$$9k - 50 = 9(3) - 50$$

$$9k - 50 = -23$$

19. $x + x + 2 + x + 4 = 18$

$$3x + 6 = 12$$

$$x = 4$$

The numbers are 4, 6 and 8.

20. $\frac{x}{3} = \frac{x}{4} + 1$

$$x = 12$$

21. $50 - 3x = 8$

$$x = 14$$

22. $5 + 4x = 65$

$$x = 15$$

5 MARKS QUESTIONS

23. Let Mahanth's father's age be x .

Then, Mahanth's age = $x - 26$

Mother's age = $x - 2$

Grandfather's age = $x + 25$

ATQ, $x + x - 26 + x - 2 + x + 25 = 125$

$$x = 42$$

Father's age = 32 years

Mahanth's age = 6 years

Mother's age = 30 years

Grandfather's age = 57 years

24. ATQ, $l = 2b$

$$\text{Perimeter} = 2(l + b) = 60$$

$$2(2b + b) = 60$$

$$b = 10m$$

$$l = 20m$$

25. ATQ, $100 + 50(x) = 550$

$$50x = 450$$

$$x = 9$$

His older brother was going at a speed of $35 + 9 \text{ km/hr} = 44 \text{ km/hr}$

CASE STUDY QUESTIONS (4 MARKS EACH)

26. i) The other number is $60 - x$

$$60 - x - x = 30$$

$$x = 15$$

Therefore, the other number is 45.

ii) $60 - x - x = 60 - 2x$

iii) The numbers are 15 & 45.

27. a) $x + 10$

b) $x + 13$

c) $x + 5$

d) $2x + 18$

28. a) $2x = 60$

b) $4y = 20$

c) Sam paid Rs.30 and Gopi paid Rs.20

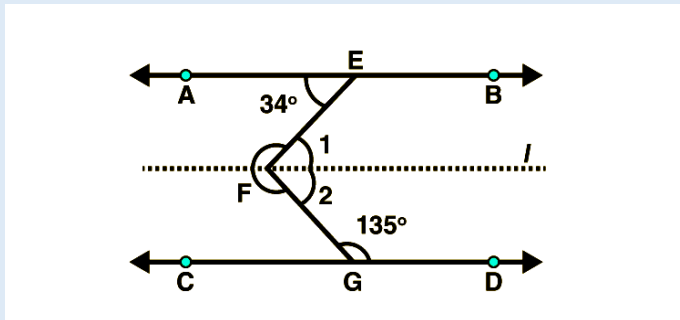
CHAPTER – 5: LINES AND ANGLES

MULTIPLE CHOICE QUESTIONS

1. The angles $x-10^\circ$ and $190^\circ-x$ are (AO2)
- A. Interior angles on the same side of the transversal
 - B. Vertically opposite angles
 - C. Complementary angles
 - D. Supplementary angles
2. If two parallel lines are intersected by a transversal, then each pair of corresponding angles are

(AO1)

- A. Equal
 - B. Supplementary
 - C. Complementary
 - D. Unequal
3. In the given figure , if $AB \parallel CD$, then which of the following statements is true (AO2)



- A. $\angle 1 + \angle 2 = 79^\circ$
 - B. $\angle 1 + \angle 2 = 101^\circ$
 - C. $\angle 1 + \angle 2 = 169^\circ$
 - D. $\angle 1 + \angle 2 = 90^\circ$
4. Suppose two lines are given. How many transversals can you draw for these lines? (AO2)
- A. Only one line
 - B. Two lines
 - C. Five lines
 - D. Infinitely many lines

5. Which of the following pair of angles is complementary? (AO1)

- A) 75° and 65° B) 60° and 60° C) 48° and 42° D) 90° and 90°

6. Which pair of angles is supplementary?

- A) 102° and 78° B) 2° and 78° C) 100° and 70° D) None of these

7. A line that intersects two or more lines at distinct points is called
(AO1)

- A) Parallel Lines B) Transversal C) Intersecting lines D) Lines

8. If two supplementary angles are in the ratio of 1:2, then the bigger angle is
(AO2)

- A) 120° B) 125° C) 110° D) 90°

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following.

(A) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).

(A) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)

(C) Assertion (A) is true but reason (R) is false.

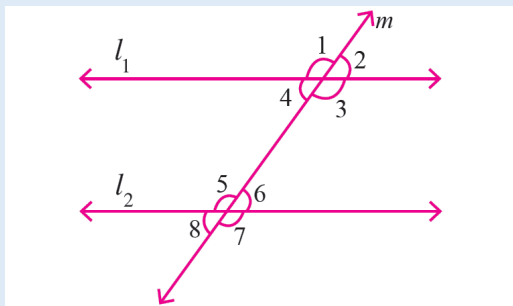
(D) Assertion (A) is false but reason (R) is true.

9. Assertion (A): 65° and 25° are complementary angles.

Reason (R): The sum of the measures of two complementary angles is 90° . (AO1)

10. Assertion (A): In the given figure if two lines are parallel, then $\angle 4 = \angle 6$.

Reason (R): When a transversal intersects a set of parallel lines, then the alternate interior angles are equal each other.



11. Assertion (A): When the sum of the measures of two angle is 180° , the angles are called supplementary angles.

Reason (R): Two acute angles always be complement to each other. (AO1)

12. Assertion (A): When the sum of the measures of two angle is 90° , the angles are called complementary angles.

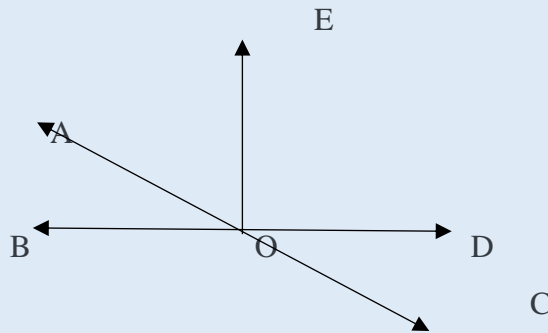
Reason (R): One obtuse and one acute angle can make a pair of complementary angles. (AO2)

2 MARKS QUESTIONS

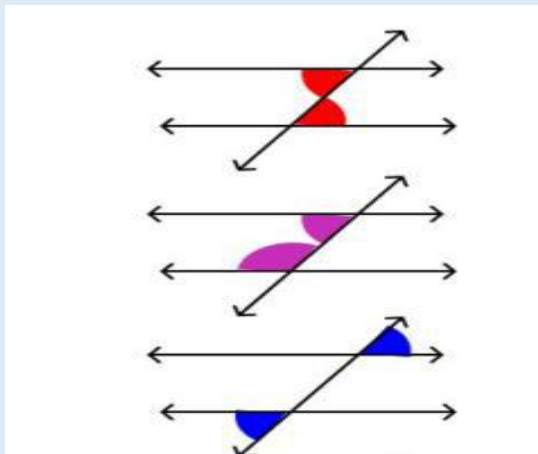
13. Find an angle which is $\frac{2}{3}$ of its Complement. (AO2)
14. Two Complementary angles are in the ratio 2:7, find the angles. (AO2)
15. Two Supplementary angles are in the ratio of 4:6, find the angles. (AO2)
16. The difference in the measure of two complementary angles is 26° .
Find the measure of the angles. (AO2)
17. Two supplementary angles are $(2x+9)^\circ$ and $(5x-4)^\circ$. Find the angles. (AO2)

3 MARKS QUESTIONS

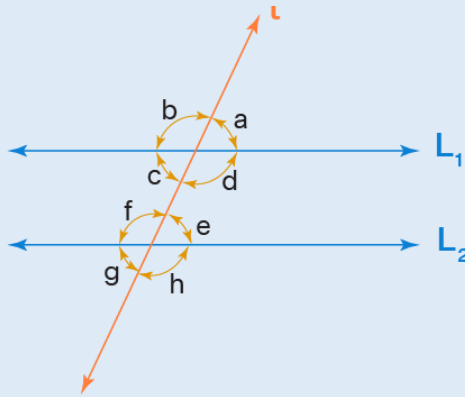
18. In the given figure, name the following pairs of angles



- i) Obtuse vertically opposite angles (AO2)
- ii) Unequal supplementary angles (AO2)
- iii) Adjacent angles that do not form a linear pairs (AO2)
19. Names the pair of angles in each figure (AO1)

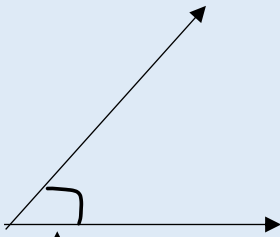


20. In the following figures, line1 \parallel line2. Find the value of $\angle f$ and $\angle g$, If $\angle b = 130^\circ$. (AO1)(AO2)



21. Identify the angles in the given figures: (AO1)

(i)



=

(ii)



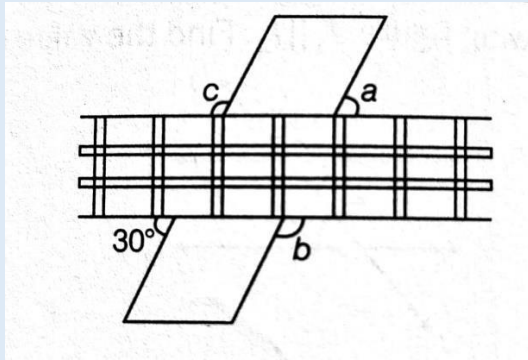
= _____

(iii)



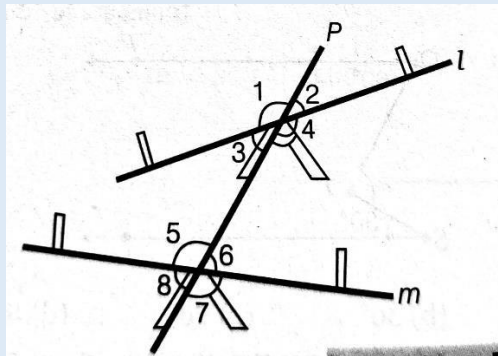
= _____

22. Find the measure of the angles made of an equilateral triangle. (AO2)



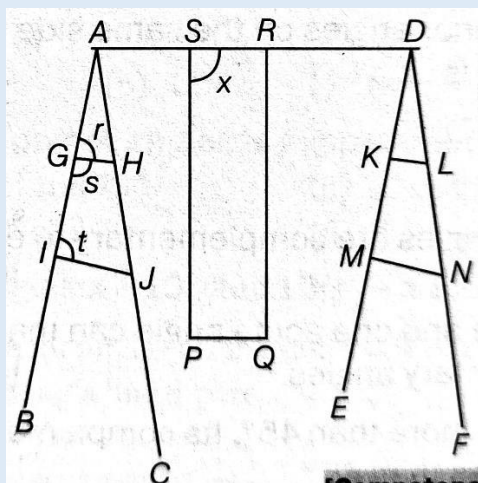
CASE BASED QUESTIONS (4 MARKS QUESTIONS)

27. A diagram of see-saw is given below.



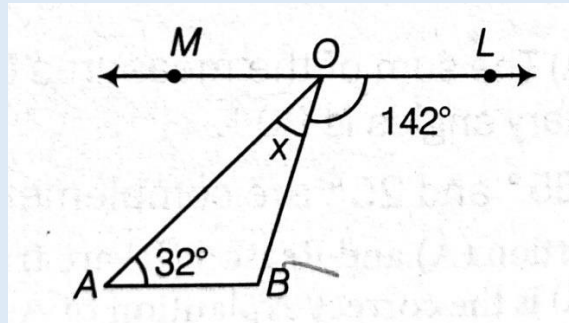
- i) State all the pairs of vertically opposite angles in the figures. (AO1)
- ii) Which angles is a pair of alternate exterior angles? (AO1)

28. In the figure given below, AD is as straight line. PS and QR are perpendicular to AD
GH is parallel to IJ and KL is parallel to MN.



- i) What types of angles are $\angle r$ and $\angle t$? (AO1)
- ii) The measure of $\angle s=120^\circ$. What is the measure of $\angle t$? (AO2)
- iii) What is the measure of $\angle X$? (AO1)

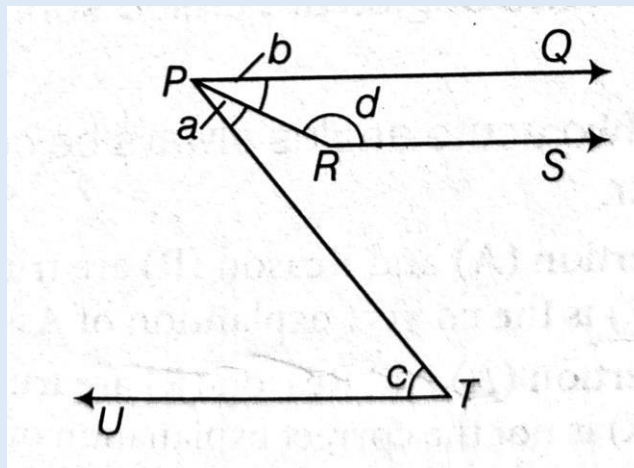
29. Anil is a student of class VII. His teacher explains the concept of lines angles. At the end of the class his teacher conduct a 10 min test. The question was asked in the test is given below



If $AB \parallel ML$ and $\angle A=32^\circ$

- i) Find the value of x . (AO2)
- ii) Find the value of $\angle MOB$. (AO2)
- iii) The answer given by Anil in (i) was 46° . Is it correct or not? What type of value depicted by Anil's answer?

30. In the given figure, PQ, RS and UT are parallel lines



- (i) If $=57^\circ$ and $a=\frac{c}{3}$, then find the value of $\angle d$. (AO2)
- (ii) If $=75^\circ$ and $a=\frac{2}{5}c$, then find the value of $\angle b$. (AO2)
- (iii) $\angle a + \angle b = \angle c$, Is it correct, justify it. (AO2)

SOLUTIONS OF CHAPTER – 5: LINES AND ANGLES

MULTIPLE CHOICE QUESTIONS

1. D
2. A
3. A
4. D
5. C
6. A
7. B
8. A

ASSERTION AND REASON QUESTIONS

9. A
10. A
11. C
12. C

2 MARKS QUESTIONS

13. Let x be the complement of an angle, then the angle will be $\frac{2}{3}x$

We know that the sum of complementary angles is 90° .

$$\text{So, } x + \frac{2}{3}x = 90^\circ$$

$$\frac{3x+2x}{3} = 90^\circ$$

$$\frac{5x}{3} = 90^\circ$$

$$5x = 90^\circ \times 3 = 270^\circ$$

$$x = 270^\circ / 5 = 54^\circ$$

Hence $x = 54^\circ$.

14. Let the two complement angles be $2x$ and $7x$.

$$\therefore 2x + 7x = 90^\circ$$

$$9x = 90^\circ$$

$$x = 10^\circ$$

so the angles are $2 \times 10^\circ = 20^\circ$ and $7 \times 10^\circ = 70^\circ$.

15. Let the two supplementary angles be $4x$ and $6x$.

$$\therefore 4x + 6x = 180^\circ$$

$$10x = 180^\circ$$

$$x = 18^\circ$$

so the angles are $4 \times 18^\circ = 72^\circ$ and $6 \times 18^\circ = 108^\circ$.

16. The difference in the measure of two complementary angles is 26° i.e.,

Let the angle be x and then the complement of x will be $(90 - x)^\circ$.

$$x - (90 - x)^\circ = 26^\circ$$

$$2x - 90^\circ = 26^\circ$$

$$2x = 26^\circ + 90^\circ$$

$$2x = 116^\circ$$

$$x = 116^\circ / 2 = 58^\circ$$

so $x = 58^\circ$ and complement of x is $90^\circ - 58^\circ = 32^\circ$

17. Here Given two supplementary angles are $(2x+9)^\circ$ and $(5x-4)^\circ$

$$\text{So } (2x+9)^\circ + (5x-4)^\circ = 180^\circ$$

$$7x + 5 = 180^\circ$$

$$7x = 175^\circ$$

$$x = 25^\circ$$

3 MARKS QUESTIONS

18.

- i) Obtuse Vertically Opposite Angle is $\angle AOD$, $\angle BOC$.
- ii) Unequal Supplementary Angles is $\angle AOE$, $\angle EOC$.
- iii) Adjacent angles that do not form linear pair $\angle AOB$ and $\angle AOE$; $\angle AOE$ and $\angle AOD$; $\angle EOD$ and $\angle COD$.

19. Alternate Interior Angle , Interior Angles on the same side of transversal , Alternate Exterior Angle .

20. Here given $\angle b = 130^\circ$

So $\angle f = 130^\circ$ (Corresponding angles are equal)

Since $\angle f + \angle g = 180^\circ$ (linear pair)

$$\angle g = 180^\circ - \angle f$$

$$\angle g = 180^\circ - 130^\circ = 50^\circ$$

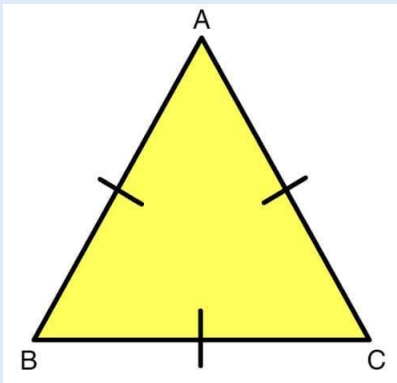
So $\angle f = 130^\circ$ and $\angle g = 50^\circ$.

21. Acute angle , Right Angle and Obtuse Angle. .

22. Let $\triangle ABC$ be an equilateral triangle

Since ,all the angles of an equilateral triangles are equal

$$\therefore \angle A = \angle B = \angle C = x \quad (\text{say})$$



We know that sum of all the angles of a triangle is 180°

$$\therefore \angle A + \angle B + \angle C = 180^\circ$$

$$x + x + x = 180^\circ$$

$$3x = 180^\circ$$

$$x = \frac{180^\circ}{3} = 60^\circ$$

hence, $x = \angle A = \angle B = \angle C = 60^\circ$

5 MARKS QUESTIONS

23.

since $AF \parallel ED$ and EF is a transversal

So, $\angle AFE = \angle FED = 40^\circ$ (ALTERNATE INTERIOR ANGLES)

Also, $AB \parallel CD$

70° and $(\angle AFE + \angle EFD)$ form a linear pair angles

$$70^\circ + (\angle AFE + \angle EFD) = 180^\circ$$

$$70^\circ + 40^\circ + \angle EFD = 180^\circ +$$

$$\angle EFD = 180^\circ - 110^\circ = 70^\circ$$

$$\angle EFD = 70^\circ$$

24.

i) angles between band $c = 30^\circ$ (vertically opposite angles)

ii) angles between d and e + angles between e and $c = 180^\circ$ (by linear pair)

\therefore angles between d and $e = 180^\circ - 75^\circ = 105^\circ$ (since angles between c and $e = 75^\circ$)

iii) angles between d and f + angles between d and $e = 180^\circ$ (since pair of cointerior angles)

\therefore angles between d and $f = 180^\circ - 105^\circ = 75^\circ$

iv) angles between c and $f =$ angles between d and f (corresponding angles)

\therefore angles between c and $f = 75^\circ$

25.

Given, $AE \parallel GF \parallel BD, AB \parallel CG \parallel DF, \angle CHE = 120^\circ$

SINCE $AE \parallel BD$

THEREFORE $\angle CHE + \angle HCD = 180^\circ$ (cointerior angles)

$$120^\circ + \angle HCD = 180^\circ$$

$$\angle HCD = 180^\circ - 120^\circ = 60^\circ$$

$\angle HCD = \angle ABC = 60^\circ$ (corresponding angles)

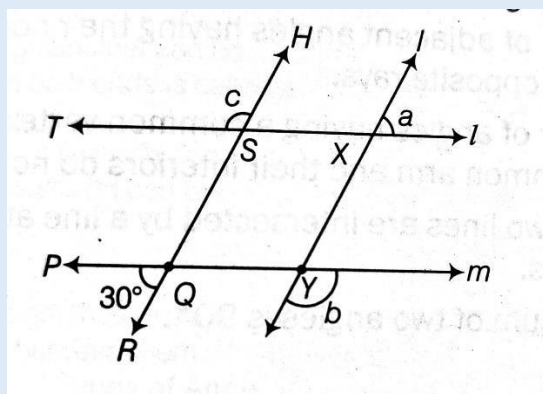
$\angle CDE + \angle HCD = 180^\circ$ (cointerior angles)

$$60^\circ + \angle CDE = 180^\circ$$

$$\angle CDE = 180^\circ - 60^\circ = 120^\circ$$

26.

Firstly make a rough diagram of given figure



Given $\angle PQR = 30^\circ$

$\angle HST = \angle PQS$ (corresponding angles)

Or $\angle PQS = \angle c$

Since $\angle RQS = 180^\circ$ (by linear pair)

$\therefore \angle PQR + \angle PQS = 180^\circ$

$30^\circ + \angle c = 180^\circ$

$\angle c = 180^\circ - 30^\circ$

$\angle c = 150^\circ$

Since $\angle XYQ = \angle PQS$ (corresponding angles)

And $\angle XYQ = \angle b$ (vertically opposite angles)

$\therefore \angle b = \angle c$ or $\angle b = 150^\circ$

Now $\angle IXS = \angle XYQ$ (corresponding angles)

$\angle IXS = 150^\circ$

HERE, $\angle IXS + \angle a = 180^\circ$ (linear pair)

$150^\circ + \angle a = 180^\circ$

$\angle a = 180^\circ - 150^\circ = 30^\circ$

CASE BASED QUESTIONS (4 MARKS QUESTIONS)

27.

i) When two lines intersect each other, then the opposite angles, formed due to +intersection are called vertically opposite angles. A pair of vertically opposite angles are always equal to each other.

Therefore, the vertically opposite angles are

$\angle 1, \angle 4; \angle 2, \angle 3; \angle 5, \angle 7; \angle 6, \angle 8$

ii) We know that alternate exterior angles are the pair of angles on the other side of the two parallel lines but on the opposite side of the transversal

therefore, $\angle 2$ and $\angle 8$ are alternate exterior angles

28. i) Since, GH is parallel to IJ and GI is the transversal

$\therefore \angle r = \angle t$ (corresponding angles)

Hence, $\angle r$ and $\angle t$ are corresponding angles

ii) Given, $GH \parallel IJ$ and GI is the transversal and $\angle s = 120^\circ$

we know that if a transversal intersects two parallel lines, then the interior angles on same side of the transversal is supplementary

$$\therefore \angle s + \angle t = 180^\circ$$

$$120^\circ + \angle t = 80^\circ$$

$$\angle t = 180^\circ - 120^\circ \quad \text{therefore } \angle t = 60^\circ$$

iii) Given AD, is a straight lines ,PS and QR are perpendicular to AD

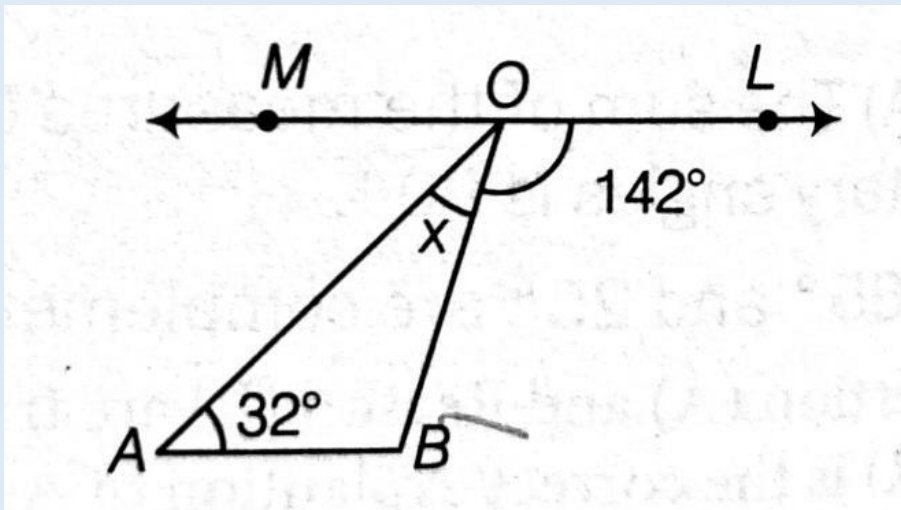
when two straight lines intersect each other at 90°

or are perpendicular to each other at the intersection ,they form the right angle.

Thus ,lines PS is perpendicular to AD , $\angle x$ is a straight angle i.e 90°

29. i) Given, $AB \parallel ML$, $\angle LOB = 142^\circ$

$$\angle A = 32^\circ$$



$\angle MOA$ and $\angle A$ are alternate angles.

$$\text{So, } \angle MOA = 32^\circ$$

Also, ($\angle MOA + x$) and $\angle 142^\circ$ form a linear pair.

$$\text{So, } \angle MOA + x + 142^\circ = 180^\circ$$

$$32^\circ + x + 142^\circ = 180^\circ$$

$$x = 180 - 142^\circ - 32^\circ$$

$$x = 180^\circ - 172^\circ = 6^\circ$$

iii) $\angle MOB = \angle MOA + x = \angle A + x$ ($\angle MOA = \angle A$ alternate interior angles)

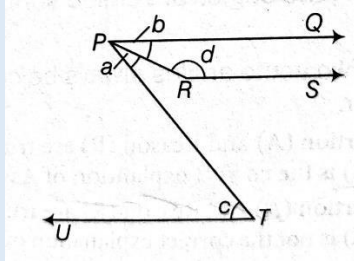
$$\text{Therefore } \angle MOB = 32^\circ + 6^\circ = 38^\circ$$

iii) Anil's answer in the test was not correct. The value of x and 6°

since anil does not understand the concept of alternate angles and linear pair . so ,he was still confused about lines and angles chapter.

30.

Here, $PQ \parallel RS \parallel UT$



i) Given $c=57$ and $a=c/3$

Since $PQ \parallel UT$

$\therefore \angle UTP = \angle QPT$ (alternate interior angles)

$\angle c = \angle a + \angle b$ (since $\angle QPT = \angle a + \angle b$)

$$57^\circ = \frac{57^\circ}{3} + \angle b$$

$$57^\circ - 19^\circ = \angle b$$

$$\angle b = 38^\circ$$

$$\angle b + \angle d = 180^\circ$$

$$\angle d = 180^\circ - 38^\circ = 142^\circ$$

ii) Given $c=75^\circ$ and $a=\frac{2}{5}c$

$$\text{Now } a = \frac{2}{5} * 75^\circ = 30^\circ$$

$\therefore \angle c = \angle a + \angle b$ (alternate interior angles)

$$75^\circ = 30^\circ + \angle b$$

$$\angle b = 45^\circ$$

iii) $\angle a + \angle b = \angle TPR + \angle RPQ = \angle TPQ$

By alternate interior angle property it can be say that

$$\angle UTP = \angle TPQ$$

$$\therefore \angle a + \angle b = \angle c$$

CHAPTER 6: THE TRIANGLE AND ITS PROPERTIES

MULTIPLE CHOICE QUESTIONS

1. Which type of triangle has all three sides of different lengths? (A01)
 - a. Equilateral Isosceles
 - b. Scalene
 - c. Right-angled

2. The sum of the interior angles of any triangle is: (A01)
 - a. 90 degrees
 - b. 180 degrees
 - c. 360 degrees
 - d. 270 degrees

3. In an isosceles triangle, the angles opposite the equal sides are: (A01)
 - a. Equal
 - b. Different
 - c. Always 90 degrees
 - d. Always 60 degrees

4. According to the triangle inequality theorem, the sum of the lengths of any two sides of a triangle must be: (A01)
 - a. Equal to the length of the third side
 - b. Greater than the length of the third side
 - c. Less than the length of the third side
 - d. Less than or equal to the length of the third side

5. How many medians can a triangle have? (A01)
 - a. 2
 - b. 1
 - c. 3
 - d. 0

6. In the Pythagoras property, the triangle must be _____ . (A01)
 - a. acute angled
 - b. right angled

- c. obtuse angled
- d. None of these

7. Triangle ABC is right-angled at C. If $AC = 5$ cm and $BC = 12$ cm find the length of AB. (AO2)

- a. 7 cm
- b. 17 cm
- c. 13 cm
- d. None of these.

8. How many acute angles can a right triangle have? (AO1)

- a. 1
- b. 2
- c. 3
- d. 0

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following:

- (a) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

9. Assertion (A): In a triangle, the sum of the lengths of any two sides must be greater than the length of the third side. (AO2)

Reason (R): This property is known as the Triangle Inequality Theorem.

10. Assertion (A): All angles in an equilateral triangle are 60 degrees. (AO2)

Reason (R): The sum of the angles in any triangle is 180 degrees.

11. Assertion (A): An isosceles triangle has two equal sides. (AO2)

Reason (R): The angles opposite the equal sides of an isosceles triangle are also equal.

12. Assertion (A): In a right-angled triangle, the hypotenuse is always the longest side.

Reason (R): The hypotenuse is the side opposite the right angle. (AO2)

2 MARKS QUESTIONS

1. A triangle has two angles measuring 50 degrees and 60 degrees. Calculate the measure of the third angle. (AO1)
2. Given the sides of a triangle are 7 cm, 10 cm, and 15 cm, verify if these sides can form a triangle using the Triangle Inequality Theorem. (AO2)
3. If an isosceles triangle has one angle measuring 40 degrees, what are the measures of the other two angles? (AO2)
4. If one exterior angle of a triangle measures 110 degrees, find the measure of the interior angle adjacent to it. (AO1)
5. In an equilateral triangle, if the perimeter is 24 cm, what is the length of each side? (AO1)

3 MARKS QUESTIONS

1. A triangle has angles measuring 35 degrees and 85 degrees. Calculate the measure of the third angle. Then, determine whether the triangle is acute, obtuse, or right-angled. (AO2)
2. In an isosceles triangle, the measure of non-equal angle is 40 degrees. Find the measure of the two equal angles. (AO1)
3. A right-angled triangle has one side of 5 cm and another side of 12 cm. Find the length of the hypotenuse. Also, determine the type of the right-angled triangle based on its side lengths. (AO2)
4. If one exterior angle of a triangle is 120 degrees, find the measures of the two interior opposite angles if they are equal. Then, classify the type of triangle based on the measure of these interior angles. (AO2)
5. In an equilateral triangle, if the perimeter is 27 cm, calculate the length of each side. Also, find the measure of each angle in the triangle. (AO1)

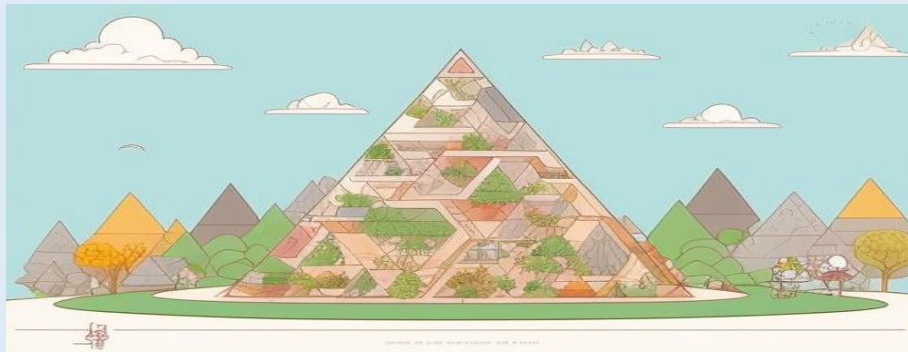
5 MARKS QUESTIONS

1. A triangle has angles in the ratio 2:3:4. (AO2)
 - a. Find the measures of each angle in the triangle.

- b. Determine if the triangle is acute, obtuse, or right-angled based on the angle measures.
 - c. Find the sum of the angles of the triangle and verify the sum is consistent with the properties of a triangle.
2. You are given a triangle with sides of lengths 7 cm, 24 cm, and 25 cm. (AO2)
- a. Classify the triangle based on its side lengths.
 - b. Verify if the triangle is a right triangle using the Pythagorean theorem.
 - c. If it is a right triangle, find the area of the triangle using the base and height.
 - d. In a triangle, two angles are in the ratio 2:3. The third angle is twice the smallest angle.
 - e. Find the measures of all three angles.

CASE BASED QUESTIONS

1. A construction company needs to build a triangular garden with sides measuring 7 meters, 24 meters, and 25 meters. The garden will be in the shape of a right triangle.



- a. Verify if the triangle is a right triangle. (AO2)
 - b. Find the area of the garden. (AO2)
 - c. Calculate the length of the garden's perimeter. (AO1)
2. You are designing a triangular banner for a school event. The banner will have sides of lengths 9 cm, 12 cm, and 15 cm.
- a. Calculate the area of the triangular banner. (AO2)
 - b. Determine the half-perimeter of the triangle. (AO1)
 - c. If you want to trim 3 cm from each side then find the perimeter of the new triangle formed. (AO2)



3. You are given a triangular field where the lengths of the sides are 20 meters, 30 meters, and 40 meters.
 - a. Find the half perimeter of the triangle. (AO1)
 - b. If you want to plant trees along the boundary, calculate the total length of fencing required. (AO2)
 - c. What is the type of triangle. (AO1)

4. you are planning a triangular flower bed with sides measuring 9 meters, 12 meters, and 15 meters.



- a. Determine if the triangle is a right triangle. Show your calculations. (AO2)
 - b. Find the area of the flower bed. (AO2)
 - c. If you want to add a decorative border around the flower bed, calculate the total length of the border. (AO1)

5. You are designing a triangular roof for a shed. The roof is a right-angled triangle with a side height of 8 meters and base 6 meter.
 - a. Calculate the hypotenuse of the roof. (AO2)

- b. Determine the area of the triangular roof. (A02)
- c. If you need to paint the roof and 1 litre of paint covers 12 square meters, how many liters of paint will you need? (A02)



SOLUTIONS: CHAPTER 6 - THE TRIANGLE AND ITS PROPERTIES

MULTIPLE CHOICE QUESTIONS

1. C
2. B
3. A
4. B
5. A
6. B
7. A
8. A

2 MARKS QUESTIONS

1. Let the angle be x
 $x + 50^\circ + 60^\circ = 180^\circ$ (Angle sum property of triangle)
 $x + 110^\circ = 180^\circ$
 $x = 180^\circ - 110^\circ = 70^\circ$
2. We'll add the sides in pairs and check if the sum is greater than the remaining side. If all the 3 pairs satisfy this condition then the triangle is possible.
3. Let the angle be x
 $x + x + 40^\circ = 180^\circ$ (Angle sum property of triangle)
 $2x + 40^\circ = 180^\circ$
 $2x = 180^\circ - 40^\circ = 140^\circ$

$$x=140/2=70^\circ$$

4. Let each interior opposite angle be x , then by exterior angle sum property of triangle, we get, $x + x = 120^\circ$

$$\Rightarrow 2x = 120^\circ \Rightarrow x = 60^\circ$$

Since the sum of the interior angles of a triangle is always 180° , we can find the third angle: Third angle = $180^\circ - (60^\circ + 60^\circ) = 60^\circ$

All three angles of the triangle are 60° , meaning the triangle is equilateral (a triangle with all angles and sides equal).

Thus, the triangle is an equilateral triangle.

5. Perimeter of equilateral triangle = 24 cm

$$3 \times \text{side of triangle} = 24 \text{ cm}$$

$$\text{Side of triangle} = 24/3 = 8 \text{ cm}$$

3 MARKS QUESTIONS

1. $X + 35^\circ + 85^\circ = 180^\circ$ (Angle sum property of triangle)

$$X + 120^\circ = 180^\circ$$

$X = 180^\circ - 120^\circ = 60^\circ$, Since all the angles are Acute hence its a Acute angle triangle

2. Let the angle be x

$$X + X + 40^\circ = 180^\circ \text{ (Angle sum property of triangle)}$$

$$2X + 40^\circ = 180^\circ$$

$$2X = 180^\circ - 40^\circ = 140^\circ$$

$$X = 140/2 = 70^\circ$$

Hence the remaining angles are 70° each.

3. Using Pythagoras theorem

$$5^2 + 12^2 = \text{hypotenuse}^2$$

$$\text{Hypotenuse}^2 = 144 + 25 = 169$$

$$\text{hypotenuse} = 13 \text{ cm}$$

Since all the sides are of unequal lengths, it's a Scalene Triangle

4. Interior Angle + Exterior Angle = 180° (Linear Pair)

$$\text{Int Angle} + 120^\circ = 180^\circ$$

$$\text{Int Angle} = 180 - 120 = 60^\circ$$

Since all the angles of this triangle are equal, it's an Equilateral Triangle.

5. Perimeter of equilateral triangle = 27 cm

3 x side of triangle = 27 cm

Side of triangle = $27/3=9$ cm

For an Equilateral triangle, the measure of all angles is 60° .

5 MARKS QUESTIONS

1.

a. Let the angles be $2x$, $3x$ and $4x$

$$2x+3x+4x=180^\circ$$

$$9x=180^\circ$$

$$x=180/9=20^\circ$$

$$\text{Hence } 2x=40^\circ$$

$$3x=60^\circ$$

$$4x=80^\circ$$

b. Since all the angles of this triangle are acute angles, this triangle is an Acute angled triangle.

c. The sum of all the angles is 180° . Hence it is consistent with the angle sum property of the triangle.

2.

a. Since all the sides of the triangle are of different lengths, its a Scalene Triangle

b. Yes since

$$25^2=24^2+7^2$$

$$625=576+49=625$$

Hence by Pythagoras theorem, it's a right angled triangle.

c. Area of a right angled triangle is= $\frac{1}{2}$ x base x height

$$= \frac{1}{2} \times 7 \times 24$$

$$=7 \times 12$$

$$=84 \text{ cm}^2$$

3.

a. Let the angles be $2x$, $4x$ and $5x$

By angle sum property

$$2x+4x+3x=180^\circ$$

$$9x=180^\circ$$

$$x=180/9=20^\circ$$

$$\text{Hence } 2x=40^\circ$$

$$3x=60^\circ$$

$$4x=80^\circ$$

40° , 60° , 80° are the angles.

b. Since all the angles of this triangle are acute angles, this triangle is an Acute angled triangle.

CASE BASED QUESTIONS

1.

- a. Yes
- b. 84 m^2
- c. 56m

2.

- a. 54 cm^2
- b. 18 cm
- c. 27 cm

3.

- a. 45 m
- b. 90 m
- c. Scalene

4.

- a. Pythagoras theorem
- b. 54 m^2
- c. 36m

5.

- a. 10m
- b. 36m^2
- c. 3 liters

CHAPTER – 7: COMPARING QUANTITIES

MULTIPLE CHOICE QUESTIONS

1. Convert $\frac{1}{8}$ as percent? (AO 1)
(a) 25% (b) $12\frac{1}{2}\%$ (c) 16 % (d) 14 %
2. Convert 0.04 as per cent? (AO1)
(a) 10% (b) 29% (c) 25 % (d) 4 %
3. Out of 25 students, 20 are present in the . What percent of the students are absent ? (AO2)
(a) 10% (b) 50% (c) 20 % (d) 25 %
4. The angles of a triangle are in the ratio of 1:1: 2. What is the largest angle ? (AO2)
(a) 90° (b) 45° (c) 30° (d) 60°
5. The interest on a sum of Rs. 2500 for 4 years at the rate of interest 4% is ? (AO1)
(a) Rs. 100 (b) Rs. 200 (c) Rs. 300 (d) Rs. 400
6. The ratio of 6 kg to 400 g is (Ao 2)
(a) 10 : 1 (b) 15 : 1 (c) 12 : 1 (d) 6 : 1
7. A survey of 40 children showed that 25% liked playing football. How many children not liked playing football? (AO 2)
(a) 10 (b) 30 (c) 5 (d) 20
8. Meenu purchased an item for Rs. 800 and sold the same for RS. 1000 . The gain percent is ? (Ao2)
(a) 10% (b) 50% (c) 20 % (d) 25 %

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following.

- (A) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
 - (A) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
 - (C) Assertion (A) is true but reason (R) is false.
 - (D) Assertion (A) is false but reason (R) is true.
- 9.Assertion: The cost of the article was Rs.725 . If it is sold for Rs. 900 . The profit obtained is

Rs. 175 . (AO1)

Reason: Selling Price = Profit + cost price

10. Assertion (A): Anu buys a bag for ₹200 and sells it for ₹ 240, her profit % is 20% .

Reason (R): Profit percentage is calculated on the selling price. (Ao2)

11 Assertion (A): Raju gives an interest of ₹200 every year at 5% rate P.a . Raju borrowed a sum of ₹4000 .

Reason (R): Simple interest is calculated using the formula $SI = (P * R * T) / 100$. (Ao2)

12 . Assertion (A): A discount of 10% on an item priced at ₹500 will result in a saving of ₹50.

Reason (R): Discount is calculated as $(Discount\% / 100) * Marked Price$. (Ao2)

2 MARKS QUESTIONS

13. The population of town is 40000 . In which 40% are females. The number of males are?.

(AO2)

14. Rs. 120 are to be divided between Siri and Veena Siri gets 60% .what does Veena get ?

(AO2)

15.. The number students in a school in 2008 was 1000. It became 1100 in 2009. what is the percentage of increase

(AO1)

16. What is 25% of 200? What is 6% of 50 litres. (AO1)

17. Anitha wants to buy a scooty worth RS. 140000. For which she saves Rs,7000 every month from her salary . If this is 5% of her salary , How much is her salary ? (Ao2)

3 MARKS QUESTIONS

18. Gayatri's income is Rs 160000 per year. She pays 15% of this as house rent and 10% of the remainder on her child's education. The money left with her is ? (Ao2)

19. The cost of the article was Rs. 15500 and Rs. 500 was spent on its repairing. If it is sold for a profit of 15%. The selling price of the article is ? (Ao2)

20. A car is purchased for ₹150000 and after a year its value depreciates by 10%. What is its value after one year? (Ao1)

21. If a person deposits ₹5000 in a bank for 2 years at an annual interest rate of 6%, what will be the amount received at the end of 2 years including simple interest?(Ao2)

22. Convert each part of ratio into percent 3: 4: 5 . (Ao1)

5 MARKS QUESTIONS

23. For preparing cake the ratio of ingredients flour, butter and sugar is 12: 10: 8 .

i) find the percent of butter in the batter . (A01)

ii) if the sugar present is 400g , find the weight of cake in kg . (Ao2)

24 . In an orchard, $16\frac{2}{3}\%$ of the trees are apple trees. If the number of trees in the orchard is 240, find the number of other type of trees in the orchard. (A01)

25. Ram scored 553 marks out of 700 and Gita scored 486 marks out of 600 in science. Whose performance is better? (Ao1)

26. Harish purchased 50 dozen bananas for Rs 135. Five dozen bananas could not be sold because they were rotten. At what price per dozen should Harish sell the remaining bananas so that he makes a profit of 20%? (Ao2)

CASE BASED QUESTIONS (4 MARKS EACH)

27. One day I went to my colony park I saw there are many people all are busy in their routine, I found there are 150 people I saw 18 people were doing jog, 24 people were doing yoga 36 people were doing laughing therapy and rest of people were preferred to walk (Ao2)

1. What percent of people were doing Jog? (Ao1)1m

2. How many people preferred walk? (Ao2) 2m

3 What percent of people doing laughing therapy? (Ao1) 1m

28 . Anita went to the market to buy fruits. She observed the following prices: (Ao1)

1 kg of apples costs ₹100

1 kg of bananas costs ₹40

1 kg of oranges costs ₹60

1 kg of grapes costs ₹80

Questions:

- 1 Calculate the ratio of the price of apples to bananas. 1m
- 2 What is the percentage increase in the price of oranges compared to bananas? 2m
- 3 If Anita buys 2 kg of grapes and apples each, how much total amount will she spend? 1m
29. It is given that the Population of Rajasthan = is 570 lakhs, and the population of UP = is 1660 lakhs. The area of Rajasthan is = 3 lakh km sq, and area of UP = 2 lakh km sq.
- (1) How many people are present per km sq in both these States? (AO1) 2m
- (2) Which of the above State do you think has more population density and why? (Ao2) 1m
- (3) Which state has more area? (Ao1) 1m
30. Romesh borrowed Rs 2000 at 2% per annum and Rs 1000 at 5% per annum. He cleared his debt after 2 years by giving Rs 2800 and a watch. What is the cost of the watch? (Ao2)
- (1) What amount he has pay for Rs. 2000 after two years? (Ao1) 1m
- (2) what amount he has to pay for Rs, 1000 after two years? (Ao1) 1m
- (3) what is the cost of watch? (ao2) 2m
31. A school has 400 students and the ratio of boys to girls is 3:5. The school decides to increase the number of students by admitting 20 more boys and 30 more girls.
- (1) What is the initial number of boys and girls? (Ao1) 2m
- (2) What is the new number of boys and girls? (Ao2) 1m
- (3) What is the new total number of students? (Ao1) 1m

SOLUTIONS OF CHAPTER – 7: COMPARING QUANTITIES

MULTIPLE CHOICE QUESTIONS

1. (b) $12\frac{1}{2}\%$
2. (d) 4 %
3. (c) 20 %
4. (a) 90°
5. (d) Rs. 400
6. (b) 15 : 1

7. (b) 30

8. (d) 25 %

ASSERTION AND RESON QUESTIONS

9. a) both assertion and reason are correct and reason is the correct explanation for assertion

10. (c) A is true, but R is false.

11. (a) Both A and R are true, and R is the correct explanation of A.

12. (a) Both A and R are true, and R is the correct explanation of A.

2 MARKS QUESTIONS

13. Total population = 40000

Percent of women = 40%

No. of women = $40/100 \times 40000 = 16000$

No. of men = $40000 - 16000 = 24000$.

14. Money siri gets = $60/100 \times 120 = \text{Rs. } 72$

Money Veena gets = $120 - 72 = \text{Rs. } 48$

15. No. of students in 2008 = 1000

No. of students in 2009 = 1100

No. of students increased = $1100 - 1000 = 100$

% of increase = $100/1000 \times 100 = 10\%$.

16. 25% of 200

$25/100 \times 200 = 50$.

6% of 50 litres

$6/100 \times 50 = 3$ litres

17. Let Anitha's salary be x

Given 5% of x = 7000

$5/100 \times x = 7000$

$x = 7000 \times 20 = 140000$.

3 MARKS QUESTIONS

18. Money paid towards house rent = $160000 \times 15/100 = 24000$

$$\text{Remaining money} = 160000 - 24000 = 136000$$

$$\text{money paid to child's education} = 136000 \times 10/100 = 13600$$

$$\text{total spent} = 24000 + 13600 = 37600$$

$$\text{Money left with Gayatri} = 160000 - 37600 = 122400$$

19. Cost price of an article = Rs. 15500 , money spent for repairs = Rs. 500

$$\text{Total cost price} = 15500 + 500 = 16000$$

$$\text{Profit \%} = 15\% \quad , \quad \text{profit} = \frac{15}{100} \times 16000 = 2400$$

$$\text{Selling price} = 16000 + 2400 = \text{Rs. } 18400$$

20 . Initial price of the car = Rs. 150000

$$\text{Percent of depreciation after a year} = 10\%$$

$$\text{Price depreciated} = 10/100 \times 150000 = 15000$$

$$\text{Price of car after one year} = 150000 - 15000 = \text{Rs. } 135000$$

21. Given in the question: –

Principal (P) = ₹ 5000, Rate (R) = 6% p.a. and Time (T) = 2years.

If the interest is calculated uniformly on an original principal throughout the loan period, then it is called Simple interest (SI).

$$\text{SI} = (P \times R \times T)/100$$

$$= (5000 \times 6 \times 2) / 100$$

$$= (50 \times 6 \times 2) / 1 = ₹ 600$$

$$\text{Amount} = (\text{principal} + \text{SI})$$

$$= (5000 + 600) = ₹ 5600$$

22. We have to find the total parts by adding the given ratio as = 3 + 4 + 5 = 12

$$\text{1st part} = 3/12 = (3/12) \times 100 \% = 25\%$$

$$\text{2nd part} = 4/12 = (4/12) \times 100\%$$

$$= 100/3 \% = 33 \frac{1}{3} \%$$

$$\text{3rd part} = 5/12 = (5/12) \times 100\%$$

$$= (500/12) = 41 \frac{2}{3} \%$$

5 MARKS QUESTIONS

23. (i) Ratio of flour : butter: sugar = 12: 10:8

$$\text{Total parts} = 30$$

$$\text{Fraction of butter} = 10/30$$

$$\text{Percent of butter} = 10/30 \times 100 = 100/3 \% \quad 33 \frac{1}{3} \%$$

(ii) fraction of sugar = 8/ 30

let the weight of cake be y

$$8/30 \times y = 400$$

$$y = 400 \times 30/8 = 1500 \text{ g} = 1.5 \text{ kg}$$

24. Let the number of apple trees be x

$$\text{Number of trees in the orchard} = 240$$

$$\text{Percent of apple trees} = 16 \frac{2}{3} \%$$

According to the given condition, $16 \frac{2}{3} \%$ of 240 = x

$$= 16.66 \% \text{ of } 240 = x$$

$$x = (16.66/100) \times 240$$

$$x = 40 \text{ trees}$$

Number of other types of trees = Total number of trees – number of apple trees

$$= 240 - 40 = 200 \text{ trees}$$

25. Given marks scored by Ram = 553/700

$$\text{Percentage of marks scored by Ram} = (553/700) \times 100$$

$$= 0.79 \times 100 = 79\%$$

Also given that marks scored by Gita = (486/600)

Percentage of marks scored by Gita = $(486/600) \times 100$

$$= 0.81 \times 100 = 81$$

Gita's performance (81%) is better than Ram's (79%).

26. Given cost price of 50 dozens bananas that Harish purchased, CP = Rs. 135

Bananas left after removing 5 dozen rotten bananas = 45 dozens

Effective CP of one dozen bananas = $\text{Rs. } 135/45 = \text{Rs. } 3$

Calculating the price at which Harish should sell each dozen bananas to make a profit of 20% (or $1/5$), we get

$$\text{Profit \%} = (\text{Gain}/\text{CP}) \times 100$$

To get a gain of 20% we give profit % = 20

And substitute 20 = $(\text{gain}/135) \times 100$

$$\text{Gain} = 270/10 = 27$$

We know; $\text{SP} = \text{CP} + \text{Gain}$

$$\text{SP} = 27 + 135 \quad \text{SP} = 162$$

Now that SP is for 45 Dozens of bananas

Calculating for one dozen

$$= 162/4 \quad = \text{Rs. } 3.6$$

Harish should sell the bananas at Rs. 3.60 a dozen in order to make a profit of 20%.

CASE BASED QUESTIONS (4 MARKS EACH)

27. 1.A. $(18/150) * 100 = 12\%$

2.A. $150 - (18 + 24 + 36) = 72$ people

3. A. $(36/150) * 100 = 24\%$

28. 1. A. $100/40 = 5/2$ or 5:2

2.A. $((60 - 40) / 40) * 100 = 50\%$

3. A $(2 * 80) + (2 * 100) = 160 + 200 = ₹360$

29. 1.A. Rajasthan: $570/3 = 190$ lakhs/km², UP: $1660/2 = 830$ lakhs/km²
lakhs/km².

3. A. Rajasthan has more area (3 lakh km²) compared to UP (2 lakh km²).

30. 1.A $SI = (2000 \times 2 \times 2)/100 = Rs 80$ $A = P + I = 2000 + 80 = Rs. 2080$

2. A. $SI = (1000 \times 2 \times 5)/100 = Rs 100$ $A = P + I = 1000 + 100 = Rs. 1 100 .$

3. A Total amount that he will have to return = Rs. $2000 + 1000 + 80 + 100 = Rs. 3180$

Amount repaid = Rs. 2800

Value of the watch = Rs. $3180 - 2800 = Rs. 380$

31. 1. A. Boys = $(3/8) * 400 = 150$, Girls = $(5/8) * 400 = 250$

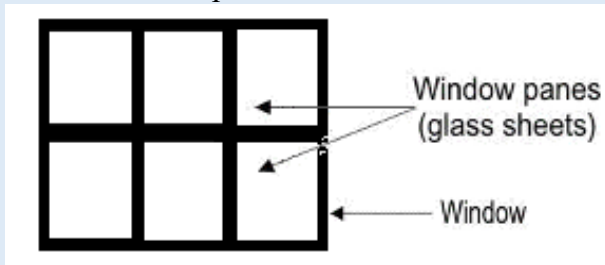
2.A. : Boys = $150 + 20 = 170$, Girls = $250 + 30 = 280$

3. A $170 + 280 = 450$

CHAPTER – 8: RATIONAL NUMBERS

MULTIPLE CHOICE QUESTIONS

- Q1.** A number when divided by 42 leaves 0 as remainder. What remainder will it leave when divided by 6? (AO2)
(a) 0 (b) 1 (c) 2 (d) 3
- Q2.** Which of the following will be equal to $\frac{2}{4}$? (AO2)
(a) one hundredth of 250 (b) 50% of 5 (c) 100% of 0.50 (d) 40% of 1
- Q3.** 140 for every 200 is the same as _____ for every 100. (AO1)
(a) 210 (b) 90 (c) 70 (d) 140
- Q4.** 5 children need to share three fourth of a chocolate equally. What part of the whole chocolate would each child get? (AO1)
(a) $\frac{3}{4} \div 5$ (b) $5 \div \frac{3}{4}$ (c) $\frac{3}{4} \times 4$ (d) $5 \div \frac{3}{4}$
- Q5.** Chirag's house has five windows like the one shown here. Chirag and his sister had to clean all the windows by themselves. Chirag 's sister cleans 2 windows fully and 3 panes of the third one. What part of the whole work did Chirag do? (AO2)



- (a) $\frac{3}{5}$ (b) $\frac{2}{3}$ (c) $\frac{6}{8}$ (d) $\frac{1}{2}$
- Q6.** In Kritvi's home there are 6 almira's. Out of 6 almira's, 2 contains Kritvi's clothes and 2 are filled with her brother Tanveer's clothes. The remaining almira's are equally used for organising the clothes of her mother and father. What fraction of total almira's are occupied by the clothes of her mother? (AO1)
(a) $\frac{3}{8}$ (b) $\frac{3}{16}$ (c) $\frac{3}{18}$ (d) $\frac{3}{32}$
- Q7.** Additive inverse of $-9\frac{1}{3}$ is _____. (AO1)
(a) $\frac{-3}{28}$ (b) $-\frac{28}{3}$ (c) $\frac{-1}{3}$ (d) $\frac{-9}{3}$
- Q8.** Which of these two $\frac{7}{-8}$, $\frac{-5}{8}$, is greater (AO1)
(a) $\frac{7}{-8}$ (b) $\frac{-5}{8}$ (c) Both are equal (d) Can't Say

ASSERTION & REASON QUESTIONS

Directions: Each of the following questions contain an Assertion (A) followed by a Reason (R). Read them carefully and answer the questions on the basis of the following options.

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

Q9. Assertion (A): $\frac{-10}{3} = -3.333\dots$ or $-3.\bar{3}$ (AO1)

Reason (R): $\frac{-10}{3}$ is a terminating decimal as division terminates i.e., comes to an end with zero as remainder.

Q10. Assertion (A): Reciprocal of $\frac{-5}{7}$ is $\frac{7}{-5}$ (AO1)

Reason (R): The non-Zero numbers whose product is 1 are reciprocals.

Q11. Assertion (A): -5, -3, 0, 2, 9, 11, $\frac{13}{12}$ all are examples of rational numbers. (AO1)

Reason (R): All integers and fractions are rational numbers.

Q12. Assertion (A): $-\frac{1}{3} \times \frac{1}{0}$ is a rational number. (AO1)

Reason (R): A number that can be expressed in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$, is called a rational number.

2 MARKS QUESTIONS

Q13. What should be added to $\frac{2}{-5}$ to get $\frac{3}{7}$? (AO2)

Q14. Write $-\frac{49}{63}$ in its standard form. (AO1)

Q15. How many rational numbers lie between two consecutive whole numbers, a and b? (AO1)

Q16. Insert 5 rational numbers between $\frac{3}{5}$ and $\frac{4}{6}$? (AO2)

Q17. Represent $\frac{6}{8}$ on number line? (AO2)

3 MARKS QUESTIONS

- Q18.** In a pipe factory, from a pipe of 100 m length, two pieces of length $\frac{21}{5}$ m and $\frac{63}{10}$ m are cut off. Find the length of the remaining pipe. (AO1)



- Q19.** In a swimming pool, Seema swims $12\frac{5}{10}$ m and reached a point in the pool. If her sister Riya starts from that point and swims another $37\frac{1}{2}$ m to complete the length of swimming pool. what is the length of swimming pool? (AO1)

- Q20.** Sarala purchases sweets from a sweet shop, he purchases $2\frac{1}{2}$ kg of Burfi, $\frac{5}{6}$ kg of Gulab Jamun and $\frac{3}{4}$ kg Rasmalai. What is the total quantity of sweets purchased by him? (AO1)

- Q21.** Zoya is an adventure traveler, one day she decided to travel on foot from her village to another town. The distance between her village & town is $55\frac{3}{4}$ km. She stops to rest after covering a distance of $43\frac{2}{3}$ km. How much distance does she further need to cover to reach the other town? (AO1)

- Q22.** Arrange the rational numbers $\frac{2}{3}$, $\frac{1}{2}$, $\frac{3}{5}$, $\frac{3}{4}$ in ascending order. (AO2)

5 MARKS QUESTIONS

- Q23.** The area of a badminton court is $\frac{3473}{50}$ m². If its Length is $\frac{1341}{100}$ meters, what is its Breadth (in decimals)? (AO2)

- Q24.** The sum of three rational numbers is $\frac{39}{6}$. If 2nd rational number is $\frac{2}{3}$ of 1st rational number and 3rd rational number is $\frac{2}{7}$ of 2nd rational number. find all the three rational numbers. (AO2)

- Q25.** Simplify: $(\frac{-4}{8} \times \frac{64}{-120}) - (\frac{10}{16} \times \frac{80}{50}) + (\frac{28}{15} \times \frac{-56}{24})$ (AO2)

CASE STUDY BASED QUESTIONS(4 MARKS EACH)

Q26. Ritam de needs a new Sofa-set for his home. So he went to nearby furniture market for purchasing it. In furniture market different shops offer the same brand sofa-set at different prices. A ₹25000 MRP sofa set was available at $\frac{4}{5}$ of its original price on Shop 1. Shop 1 was giving an additional discount equivalent to $\frac{1}{10}$ of the Sofa Set's Price, at the time of billing. Shop 2 was offering the same set at $\frac{2}{5}$ of its price with no further discount.



Based on above statement answer the following questions: -

(a) At what price was the sofa set offered by Shop 1? (AO2)

(b) At what fraction of the original price was the Sofa Set offered by Shop 1? (AO1)

OR

At what price was the Sofa Set offered by Shop 2? (AO1)

(c) Which Shop offered the Sofa Set at more economical price? (AO1)

Q27. Aaliya had ₹6000, collected as her pocket money from her parents for over a period of time. She decided to do something for poor children, for their education, as she knows that education is the only way by which they can come out of poverty. So, she decided to gift some study material to them. She spent $\frac{1}{5}$ of her money on Text books, $\frac{1}{4}$ on notebooks and $\frac{2}{3}$ of the remaining on stationery items like pens, pencils etc.



Based on above statement answer the following questions: -

(a) How much amount she spent on Text books? (AO1)

OR

How much amount she spent on notebooks? (AO1)

(b) How much amount she spent on Stationery items? (AO2)

(c) What is the final amount remaining with her after all the expenses mentioned above? (AO1)

Q28. Tanveer earns ₹86000 per month. He spends $\frac{2}{10}$ of his income on food; $\frac{1}{8}$ on house rent, $\frac{6}{20}$ on the education of children and also spends $\frac{1}{10}$ of remaining for environmental cause, every month for planting trees in nearby areas with the help of his family and neighbours.



Based on above statement answer the following questions: -

(a) What amount Tanveer spent on food expenses? (AO1)

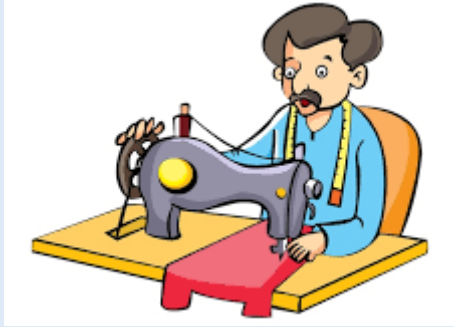
(b) How much he spent on house rent? (AO1)

(c) What portion of his salary is remaining with him after food and house rent expense? (AO2)

OR

What was his saving per month? (AO2)

Q29. Rihan, a very hardworking tailor, wants to take his family business of tailoring to a new height. So, he decided to sell stitched clothes and start his own showroom of readymade garments. He wants to start with shirts and trousers. So, he purchased Cloth of length $\frac{492}{6}$ meters for stitching shirts. He stitched total 41 shirts using equal length of cloth.



Based on above statement answer the following questions: -

(a) What length of cloth he used, to stitch each shirt? (AO1)

(b) If to stitch a trouser $\frac{5}{2}$ m cloth is required, then find the total length of cloth required to stitch 41 trousers? (AO1)

(c) If to stitch a Shirt he needs $\frac{100}{4}$ minutes and to stitch a trouser he needs $\frac{280}{8}$ minutes, then in how many hours he can stitch total 41 shirts and 41 trousers? (AO2)

Q30. Nishtha a class VII student asked her father that she wants to celebrate her upcoming birthday with children living in nearby slum area, so that they also feel happy and not feel separated from the society. Her father was very happy with this type of thinking of her daughter. So, on her birthday they (She, her father, mother, a younger brother and some family friends) went there with a 4.5 kg cake, 50 chocolates, 150 toffees, some other snacks & with gift items like water bottles, Geometry boxes etc. and celebrated her birthday.



Based on above paragraph, answer the following questions: -

(a) How much cake everyone got (in grams), if they have equally distributed the cake among all the children, including themselves, and everyone got $\frac{1}{30}$ part of cake? (AO1)

(b) If each chocolate has 9 pieces, then how many pieces of chocolate everyone got if equally distributed? (AO2)

(c) If gifts were only for slum children, and they distributed Water bottles, Geometry box etc. only to $\frac{7}{10}$ of total persons available, then how many family members and friends were available there other than slum children? (AO1)

SOLUTIONS OF CHAPTER – 8 : RATIONAL NUMBERS

MULTIPLE CHOICE QUESTIONS

- Q1. Ans. (a)
Q2. Ans. (c)
Q3. Ans. (c)
Q4. Ans. (a)
Q5. Ans. (d)
Q6. Ans. (c)
Q7. Ans. (b) - $\frac{28}{3}$
Q8. Ans. (b) $\frac{-5}{8}$

ASSERTION & REASON QUESTIONS

- Q9. Ans. (c) Assertion (A) is true, but Reason (R) is false.
Q10. Ans.: -(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
Q11. Ans.: - (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
Q12. Ans.: -(d) Assertion (A) is false, but Reason (R) is true.

2 MARKS QUESTIONS

Q13. Ans. $\frac{29}{35}$
Sol. $\frac{2}{-5} + x = \frac{3}{7}$
 $x = \frac{3}{7} - \frac{2}{-5}$
 $x = \frac{3}{7} + \frac{2}{5}$ (LCM of 5,7 is 35)
 $= \frac{3 \times 5}{7 \times 5} + \frac{2 \times 7}{5 \times 7} = \frac{15}{35} + \frac{14}{35} = \frac{15+14}{35} = \frac{29}{35}$

Q14. Ans. $-\frac{7}{9}$
Sol. Dividing numerator and denominator by 7 (common factor of 49 and 63)
 $= -\frac{49 \div 7}{63 \div 7} = -\frac{7}{9}$

Q15. Ans. Countless because there exist countless fractions between a and b and all fractions are classified as rational number.

Q16. Ans. To find the rational numbers between $\frac{3}{5}$ and $\frac{4}{6}$, we need to make denominator same.
Divide numerator & denominator of $\frac{3}{5}$ by 6 and $\frac{4}{6}$ by 5

(LCM of 5 and 6 (Denominators) 30)

$$\frac{3 \div 6}{5 \div 6} \text{ and } \frac{4 \div 5}{6 \div 5}$$
$$= \frac{18}{30} \text{ and } \frac{20}{30}$$

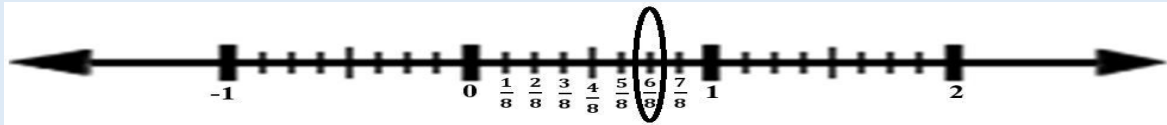
Now multiply numerator and denominator of both by 6 i.e. $5 + 1$ (Number of rational numbers required + 1)

$$= \frac{18 \times 6}{30 \times 6} \text{ and } \frac{20 \times 6}{30 \times 6}$$
$$= \frac{108}{180} \text{ and } \frac{120}{180}$$

Now we can have more than 5 rational numbers between $\frac{3}{5}$ and $\frac{4}{6}$

These are $\frac{109}{180}, \frac{110}{180}, \frac{111}{180}, \frac{112}{180}, \frac{113}{180}, \frac{114}{180}, \frac{115}{180}, \frac{116}{180}, \frac{117}{180}, \frac{118}{180}, \frac{119}{180}$ (Choose any 5)

Q17. Sol. $\frac{6}{8}$ is improper fraction, so it will lie between 0 and 1 on number line.
Divide 0 to 1 in eight equal parts.



3 MARKS QUESTIONS

Q18. Sol. Total length of pipe = 100 m

$$\text{Length of two pieces} = \frac{21}{5} + \frac{63}{10}$$
$$= \frac{42}{10} + \frac{63}{10} = \frac{105}{10} \text{ m}$$

$$\text{Length of remaining pipe} = 100 - \frac{105}{10}$$
$$= \frac{895}{10} \text{ m}$$

Q19. Sol. 50 M

$$\text{Distance covered by seema} = 12\frac{5}{10} \text{ m}$$

$$\text{Distance covered by Riya} = 37\frac{1}{2} \text{ m}$$

Length of swimming pool = distance covered by Seema + distance covered by riya

$$= 12\frac{5}{10} \text{ m} + 37\frac{1}{2} \text{ m}$$
$$= 12\frac{1}{2} + 37\frac{1}{2}$$
$$= \frac{25}{2} + \frac{75}{2}$$
$$= \frac{25+75}{2} = \frac{100}{2} = 50 \text{ m}$$

Q20. Sol. The quantity of Burfi purchased by Sarala = $2\frac{1}{2}$ kg

Quantity of Gulab Jamun purchased = $\frac{5}{6}$ kg

Quantity of Rasmalai purchased = $\frac{3}{4}$ kg

Total quantity of sweets purchased by him = $2\frac{1}{2}$ kg + $\frac{5}{6}$ kg + $\frac{3}{4}$ kg

$$= 2\frac{1}{2} + \frac{5}{6} + \frac{3}{4} \text{ kg}$$

$$= \frac{5}{2} + \frac{5}{6} + \frac{3}{4} \text{ kg}$$

$$= \frac{30+10+9}{12} \text{ kg} \quad (\text{LCM of 2,6,4 is 12})$$

$$= \frac{49}{12} \text{ kg}$$

$$= 4\frac{1}{12} \text{ kg}$$

Q21. Sol. The distance between Zoya's village and town = $55\frac{3}{4}$ km

Distance she has already covered = $43\frac{2}{3}$ km

The distance she further needs to cover to reach town = $55\frac{3}{4}$ km - $43\frac{2}{3}$ km

$$= 55\frac{3}{4} \text{ km} - 43\frac{2}{3} \text{ km}$$

$$= \frac{223}{4} - \frac{131}{3}$$

$$= \frac{669-524}{12} \quad (\text{LCM of 3 \& 3 is 12})$$

$$= \frac{145}{12} \text{ km}$$

$$= 12\frac{1}{12} \text{ km}$$

Q22. Sol. $\frac{2}{3}, \frac{3}{4}, \frac{3}{5}, \frac{1}{2}$

LCM of denominators is 60

$$\text{So, } \frac{2}{3} = \frac{2 \times 20}{3 \times 20} = \frac{40}{60} \quad \frac{1}{2} = \frac{1 \times 30}{2 \times 30} = \frac{30}{60} \quad \frac{3}{5} = \frac{3 \times 12}{5 \times 12} = \frac{36}{60} \quad \frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}$$

$$\text{So, } \frac{30}{60} < \frac{36}{60} < \frac{40}{60} < \frac{45}{60} \quad \text{or} \quad \frac{1}{2} < \frac{3}{5} < \frac{2}{3} < \frac{3}{4}$$

5 MARKS QUESTIONS

Q23. Sol. Area of badminton court = $\frac{3473}{50} \text{ m}^2$

Its length = $\frac{1341}{100}$ meters

We, know that area of rectangular field = Length x Breadth

$$\text{So, } \frac{3473}{50} = \frac{1341}{100} \times \text{Breadth}$$

$$\text{or } \frac{1341}{100} \times \text{Breadth} = \frac{3473}{50}$$

$$\begin{aligned} \text{Breadth} &= \frac{3473}{50} \div \frac{1341}{100} \\ &= \frac{3473}{50} \times \frac{100}{1341} \end{aligned}$$

$$\begin{aligned}
&= \frac{3473}{1} \times \frac{2}{1341} \\
&= \frac{3473 \times 2}{1341} \\
&= \frac{6946}{1341} \\
&= 5.1797 \\
&= 5.18 \text{ m}
\end{aligned}$$

Q24. Sol. Let the 1st rational number = y

$$\text{So, 2nd rational number} = \frac{2}{3} \text{ of } 1^{\text{st}} = \frac{2}{3} \times y = \frac{2y}{3}$$

$$\text{3rd rational number} = \frac{2}{7} \text{ of } 2^{\text{nd}} \text{ rational number} = \frac{2}{7} \text{ of } \frac{2y}{3} = \frac{2}{7} \times \frac{2y}{3} = \frac{4y}{21}$$

$$\text{Sum of all these three rational numbers} = \frac{39}{6}$$

$$y + \frac{2y}{3} + \frac{4y}{21} = \frac{39}{6}$$

$$\frac{21y + 14y + 4y}{21} = \frac{39}{6}$$

$$\frac{39y}{21} = \frac{39}{6}$$

$$y = \frac{39}{6} \times \frac{21}{39}$$

$$y = \frac{21}{6} = \frac{7}{2}$$

Q25. Sol. $\left(\frac{-4}{8} \times \frac{64}{-120}\right) - \left(\frac{10}{16} \times \frac{80}{50}\right) + \left(\frac{28}{-15} \times \frac{-56}{24}\right)$

$$= \left(\frac{4 \times 64}{8 \times 120}\right) - \left(\frac{10 \times 80}{16 \times 50}\right) + \left(\frac{28 \times 56}{14 \times 24}\right)$$

$$= \left(\frac{1 \times 8}{1 \times 30}\right) - \left(\frac{1 \times 1}{1 \times 1}\right) + \left(\frac{14 \times 1}{1 \times 3}\right)$$

$$= \frac{8}{30} - \left(\frac{1}{1}\right) + \left(\frac{14}{3}\right)$$

$$= \frac{8 - 30 + 140}{30}$$

$$= \frac{148 - 30}{30}$$

$$= \frac{118}{30}$$

$$= \frac{59}{15}$$

CASE STUDY BASED QUESTIONS(4 MARKS EACH)

Q26. (a) Sol. ₹17500

$$\text{Price of Sofa-Set offered by Shop 1} = \frac{4}{5} \text{ of } ₹25000 - \frac{1}{10} \text{ of } ₹25000$$

$$= \frac{4}{5} \times 25000 - \frac{1}{10} \times 25000$$

$$= 4 \times 5000 - 2500$$

$$= ₹20000 - 2500$$

$$= ₹17500$$

(b) Sol. $\frac{7}{10}$

$$\text{Fraction of original price} = \frac{17500}{25000} = \frac{7}{10}$$

OR

Sol. ₹10,000

Price of Sofa Set offered by Shop 2 = $\frac{2}{5}$ of ₹25000

$$= \frac{2}{5} \times 25000$$

$$= ₹10,000$$

(c) Ans. Shop 2 was selling the Sofa-Set at more economical price because Shop 2 offered more discount than Shop 1.

Q27. (a) Sol. Total amount Aaliya had = ₹6000

$$\text{Amount spent on Text books} = \frac{1}{5} \text{ of } 6000 = \frac{1}{5} \times 6000 = 1200$$

OR

$$\text{Sol. Amount spent on Notebooks} = \frac{1}{4} \text{ of } 6000 = \frac{1}{4} \times 6000 = 1500$$

$$(b) \text{ Sol. Remaining amount} = 6000 - 1200 - 1500 = 6000 - 2700 = 3300$$

$$\begin{aligned} \text{Amount spent on stationary items} &= \frac{2}{3} \text{ of remaining} = \frac{2}{3} \text{ of } 3300 = \frac{2}{3} \times 3300 \\ &= 2 \times 1100 = 2200 \end{aligned}$$

$$(c) \text{ Sol. Amount left with her} = 6000 - 1200 - 1500 - 2200 = ₹1100$$

Q28. (a) Sol. Tanveer's per month earning = ₹86000

$$\text{Amount he spent on food} = \frac{2}{10} \text{ of } ₹86000 = \frac{2}{10} \times 86000 = ₹17200$$

$$(b) \text{ Sol. Amount spent on rent} = \frac{1}{8} \text{ of } ₹86000 = \frac{1}{8} \times 86000 = ₹10750$$

$$(c) \text{ Sol. Amount spent on children education} = \frac{6}{20} \text{ of } ₹86000 = \frac{6}{20} \times 86000 = ₹25800$$

$$\text{Remaining amount} = 86000 - 17200 (\text{Food}) - 10750 (\text{House Rent}) - 25800 (\text{Children Education}) = 86000 - 53750 = ₹32250$$

OR

$$\text{Sol. Amount spent on environmental cause} = \frac{1}{10} \text{ of } ₹32250 = \frac{1}{10} \times 32250 = 3225$$

$$\text{His saving} = 86000 - 17200 (\text{Food}) - 10750 (\text{House Rent}) - 25800 (\text{Children Education}) - 3225 (\text{Environmental cause}) = ₹29025$$

Q29. (a) Sol. Total length of cloth Rihaan had = $\frac{492}{6}$ m

Total number of shirts he stitched = 41

$$\text{So the cloth required to stitch each shirt} = \frac{492}{6} \div 41$$

$$= \frac{492}{6} \times \frac{1}{41} = \frac{12}{6} = 2 \text{ m}$$

(b) Sol. Length of cloth required to stitch a trouser = $\frac{5}{2}$ m

So, total length of cloth required to stitch 41 trousers = $\frac{5}{2} \times 41 = \frac{205}{2} = 102.5$ m

(c) Sol. Time required to stitch 1 shirt = $\frac{100}{4}$ minutes

Time required to stitch 41 shirts = $\frac{100}{4} \times 41 = 25 \times 41$ minutes

Time required to stitch 1 trouser = $\frac{280}{8}$ minutes

Time required to stitch 41 trousers = $\frac{280}{8} \times 41 = 35 \times 41$ minutes

Total time required to stitch 41 shirts and 41 trousers =
= 25×41 minutes + 35×41 minutes
= $25 \times 41 + 35 \times 41$
= $41 \times (25 + 35)$ (Taking 41 common)
= 41×60 minutes

Time required in hours = $\frac{41 \times 60}{60} = 41$ hours

Q30. (a) Sol. Weight of cake is 4.5 kg or 4.5×1000 grams = 4500 grams

So, everyone got $\frac{1}{30}$ of 4500 = $\frac{1}{30} \times 4500 = 150$ grams

(b) Sol. A chocolate has 9 pieces, so total no of pieces of chocolates = $9 \times 50 = 450$ pieces

Also, cake was distributed in $\frac{1}{30}$ ratio, so total number of persons present there = 30 or $4500 \div 150 = 30$

So, the number of pieces everyone got = $450 \div 30 = 15$

(c) Sol. Total number of persons present there = 30

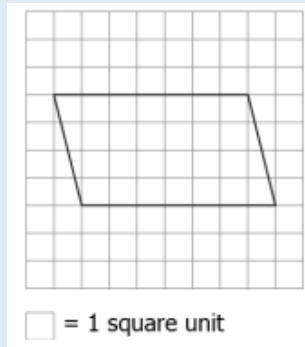
Number of Slum Children present there = $\frac{7}{10} \times 30 = 21$

So, number of family members and friends = $30 - 21 = 9$

CHAPTER - 9: PERIMETER AND AREA

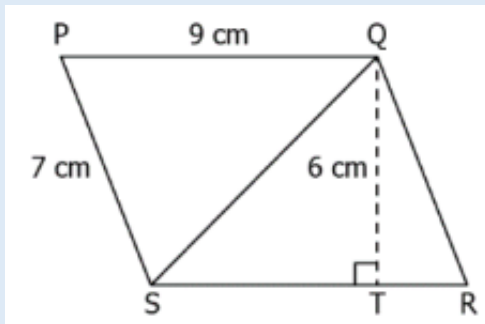
MULTIPLE CHOICE QUESTIONS

1. Consider a parallelogram shown.
(AO1)



What is the area of the parallelogram?

- a): 11 sq units b) 14 sq units c): 22 sq units d): 28 sq units
2. The height of a parallelogram is 5 cm more than its base. If the length of the base is 6 cm, what is the area of the parallelogram?
(AO1)
- a) 30 cm² b) 33 cm² c) 34 cm² d) 66 cm²
3. Consider a parallelogram shown
(AO1)

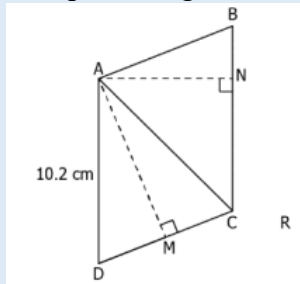


Which of these shows the area of the triangle PQS?

- a) $\frac{1}{2} (9 \times 7) \text{ cm}^2$ b) $\frac{1}{2} (9 \times 6) \text{ cm}^2$ c) $\frac{1}{2} (6 \times 7) \text{ cm}^2$ d) $(9 \times 6) \text{ cm}^2$

4. Consider a parallelogram shown

(AO2)

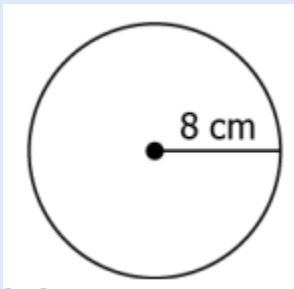


If $AM = 9$ cm and $AN = 7.5$ cm, which of these shows the area of the triangle ACD?

A: $\frac{1}{2} (8.5 \times 9)$ cm² B: $\frac{1}{2} (10.2 \times 9)$ cm² C: (10.2×9) cm D: (9×8.5) cm²

5. Consider a circle shown.

(AO1)



Which of these shows the diameter of the circle?

a) 2×8 b) $\frac{1}{2} \times 8$ c) $8 + 2$ d) $8 - 2$

6. The radius of a circle is r cm. If the radius becomes thrice, how will the circumference of the circle change? (AO2)

a) The circumference will become thrice. b) The circumference will become six times.
c) The circumference will become one-third. d) The circumference will become one-sixth.

7. The radius of a circle is 5.25 cm and its circumference are 33 cm. Which of these relations is true? (AO2)

a) $\frac{33}{10.5} = 3.14$

b) $\frac{33}{5.25} = 3.14$

c) $\frac{33}{7.255} = 3.14$

d) $\frac{33}{2.625} = 3.14$

8. Which of these statements is correct? (AO2)

- a) The circumference of a circle is always twice its diameter.
- b) The circumference of a circle is always three times its diameter.
- c) The circumference of a circle is always more than twice its diameter.
- d) The circumference of a circle is always more than three times its diameter.

ASSERTION REASON QUESTIONS

Directions: Each of the following questions contain an Assertion (A) followed by a Reason (R). Read them carefully and answer the questions on the basis of the following options.

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

9. The area of a parallelogram is 64 m^2 . If its base is 16m , then the length of the corresponding altitude is 2m . (AO1)

Reason (R): The area of a parallelogram is a product of the base and their corresponding altitude.

10. Assertion: 1760 is the circumference of circle whose radius is 2.8 m
Reason: Circumference of a circle of radius r is $2\pi r$. (AO2)

11. Assertion: 20 cm^2 is the area of the triangle if the height and breadth is 8cm and 5cm . (AO1)

Reason: Area of the triangle = $\frac{1}{2} \times b \times h$

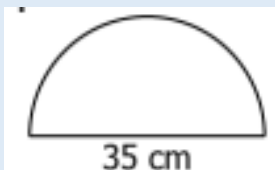
12 Assertion: 62.8cm is the circumference of a circle of diameter 20cm
Reason: circumference of the circle = πd (AO1)

2 MARKS QUESTIONS

13. Devika wants to decorate 2 semi-circular cardboards, each of radius 28 cm, by putting colored ribbon along its boundary. How much ribbon is required to decorate the cardboards? (AO2)

14. For an arts project, Aditi wants to paint a semi-circular disc as shown below. If the diameter of the disc is 35 cm, how much area does she need to paint?

(AO2)



15. Find the area of a circular mirror whose diameter is 8.4 cm (AO1)

16. The circumference of a circular plate is 3.14 m, find its area (AO1)

17. Sudhanshu divides a circular disc of radius 7 cm in two equal parts. What is the perimeter of each Semi-circular shape disc? (AO2)

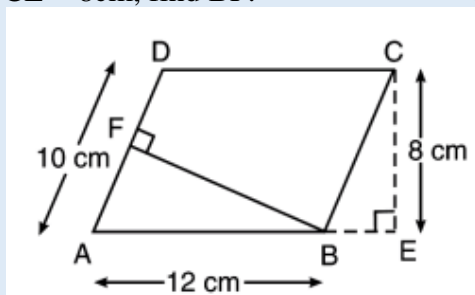
3 MARKS QUESTIONS

18. Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one meter of the lace costs Rs.15. (Take $\pi = 3.14$) (AO2)

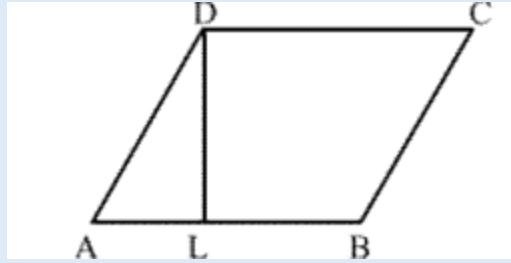
19. Two sides of a parallelogram are 20 cm and 25 cm. If the altitude corresponding to the sides of length 25 cm is 10 cm, find the altitude corresponding to the other pair of sides. (AO1)

20). A circular tyre of radius 10.5 inches takes 350 revolution to cover a certain distance. How many revolutions will a tyre of radius 7 inches take to cover the same distance? (AO2)

21. In the given figure, ABCD is a parallelogram, $CE \perp AB$ and $BF \perp AD$. If $AB = 12\text{cm}$, $AD = 10\text{cm}$ and $CE = 8\text{cm}$, find BF . (AO1)



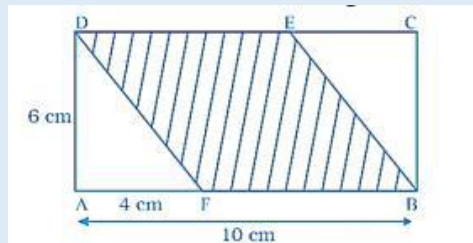
22. In the below figure, ABCD is a parallelogram, $DL \perp AB$. If $AB = 20\text{ cm}$, $AD = 13\text{ cm}$ and area of the parallelogram is 100 cm^2 , find AL (AO2)



5 MARKS QUESTIONS

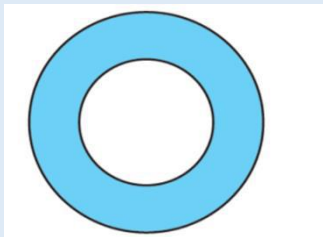
23. Find the area of a parallelogram-shaped shaded region of the figure. Also, find the area of each triangle. What is the ratio of the area of shaded portion to the remaining area of the rectangle?

(AO2)



24) A circular flower garden has an area of 314 m². A sprinkler at the center of the garden can over an area that has a radius of 12 m. Will the sprinkler water the entire garden?

(Take $\pi = 3.14$) (AO2)



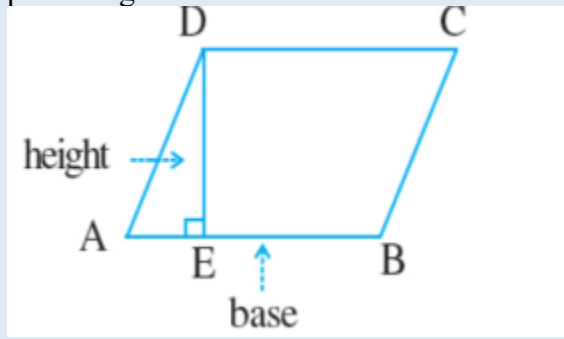
25) A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66m. What is the area of this path? ($\pi = 3.14$)

(AO1)

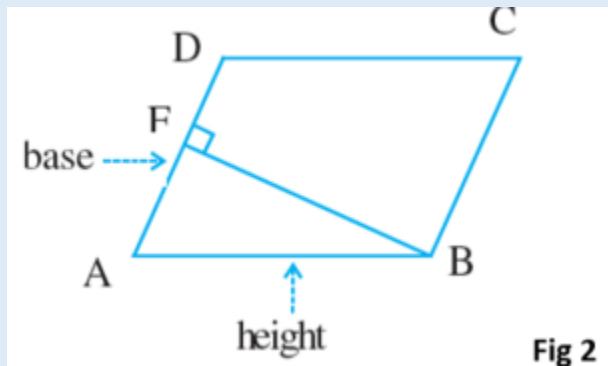
CASE BASED QUESTIONS (4 MARKS QUESTIONS)

26. The area of a parallelogram is given by = base x height = $b \times h$. Any side of a parallelogram can be chosen as base of the parallelogram. The perpendicular dropped on that side from the opposite vertex is known as height (altitude). In the parallelogram ABCD, DE is perpendicular to AB. Here AB is the base and DE is the height of the

parallelogram



In Fig 2 parallelogram ABCD, BF is the perpendicular to opposite side AD. Here AD is the base and BF is the height.



i. In fig 1 if $AB = 5$ cm and $DE = 4$ cm then what is the area of parallelogram ABCD? (AO1)

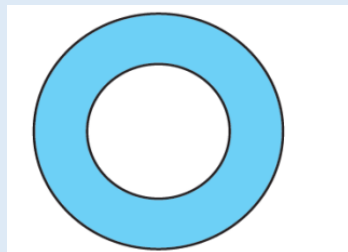
ii In fig. 2 if $AB = 6$ cm and $AD = 4$ cm then what is the perimeter of parallelogram ABCD? (AO1)

iii. In fig. 2 if the area of parallelogram ABCD is 30 cm^2 and $AD = 6$ cm, what is height BF? (AO2)

(OR)

iv. If in any parallelogram the base = 10 cm and height = 5 cm then find its area. (AO2)

27. A circular footpath of width 2m is constructed at the rate of Rs 20 per square m around a circular garden of of diameter 21m. A gardener wants to fence a circular garden of diameter 21m.

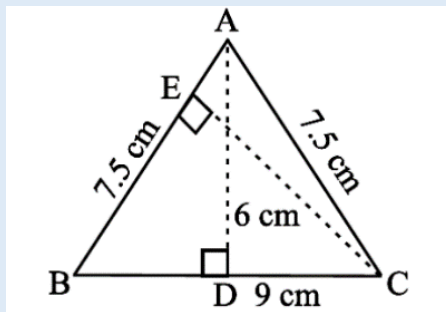


- 1) Find the length of the rope he needs to purchase, if he makes 2 rounds of the fence (AO2)
- 2) Also, find the cost of the rope, if it costs ₹4 per meter. (Take $\pi = 22/7$) (AO1)
- 3) Find the area of foot path and find the cost of construction of footpath if it costs Rs 20 per m^2 (AO2)

28. Bimal has a flexible string which is 132 cm long. He bent it into different shapes one by one

- i) Bimal bent the string to form an equilateral triangle. What will be the length of each side of the triangle formed? (AO2)
- ii) Bimal bent the string to form a square. Find the area of the square. (AO1)
- iii) He bent it into a circle. Find the radius of the circle formed. [Use $\pi = 22/7$]
The area of the circle formed by bending the string will be [Use $\pi = 22/7$]. (AO2)

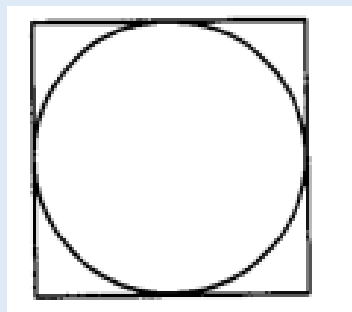
29. ΔABC is isosceles with $AB = AC = 7.5$ cm and $BC = 9$ cm (Fig 11.26). The height AD from A to BC is 6 cm.



- i) Find the area of ΔABC (AO1)
- ii) What will be the height from C to AB , i.e., CE ? (AO2)
- iii) What will be the height from B to AC ? (AO2)

30. The side of a square field is given to be 10m. A circular garden is located exactly inside the field as shown in the figure. The diameter of the garden is same as the side of the field. (Take $\pi = 22/7$)

(AO2)



- i) Find the radius of the circular garden. (AO2)
- ii) Find the circumference of the garden. (AO1)
- iii) Find the ratio of area of the square field to the area of the circular garden. (AO2)

SOLUTIONS OF CHAPTER - 9: PERIMETER AND AREA

MULTIPLE CHOICE QUESTIONS

1. 28 cm^2
2. 66 cm^2
3. $\frac{1}{2} (9 \times 6) \text{ cm}^2$
4. $\frac{1}{2} (8.5 \times 9) \text{ cm}^2$
5. 2×8
6. The circumference will become thrice
7. $\frac{33}{10.5} = 3.14$
8. The circumference of a circle is always more than three times its diameter.

ASSERTION REASON QUESTIONS

9. A is false but R is true
10. a) both assertion and reason are correct and reason is correct explanation for assertion
11. a) both assertion and reason are correct and reason is correct explanation for assertion.
12. a) both assertion and reason are correct and reason is correct explanation for assertion.

2 MARKS QUESTIONS

13. Ans. Ribbon required around its boundary = $2\pi r + 4r = (2 \times \frac{22}{7} \times 28) + 112 = 288\text{cm}$
14. 525Cm

15. Ans: Let r be the radius of the circle. Then, $r = 8.4 \div 2 = 4.2 \text{ cm}$. \therefore Area of the circle = πr^2

$$\Rightarrow A = \frac{22}{7} \times (4.2)^2 \text{ cm}^2$$

$$\Rightarrow A = \frac{22}{7} \times 4.2 \times 4.2 \text{ cm}^2 = (22 \times 0.6 \times 4.2) \text{ cm}^2 = 55.44 \text{ cm}^2$$

16. Ans: We have Circumference of the circle = $3.14 = 2\pi r$

$$\Rightarrow 3.14\text{m} = \left(2 \times \frac{22}{7} \times r\right)\text{m} \Rightarrow r = \frac{3.14 \times 7}{2 \times 22}\text{m} = \frac{1}{2}\text{m}$$

\therefore Area of the circle = πr^2

$$\Rightarrow A = \frac{22}{7} \times \left(\frac{1}{2}\right)^2 \text{m}^2$$

$$\Rightarrow A = \left(\frac{22}{7} \times \frac{1}{2} \times \frac{1}{2}\right)\text{m}^2 = \frac{22}{28}\text{m}^2 = 0.785\text{m}^2$$

17.

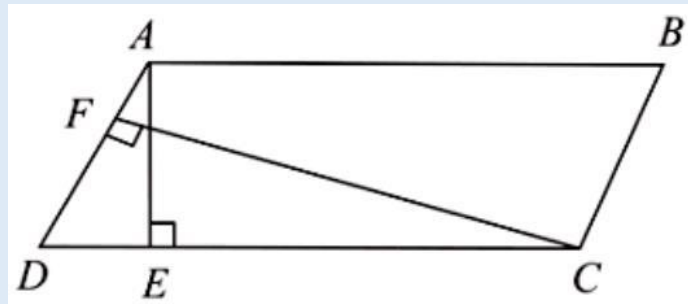
Ans: Perimeter of semicircular shaped disc = $\pi r + 2r$

$$= \left(\frac{22}{7} \times 7\right) + (2 \times 7) = \left(\frac{22}{7} \times 7\right) + (14) = 22 + 14 = 36 \text{ cm}$$

3 MARKS QUESTIONS

18. Ans: Diameter of the circular table = 1.5 m we know that radius (r) = $d/2 = 1.5/2 = 0.75$ m
Then, Circumference of the circle = $2\pi r = 2 \times 3.14 \times 0.75 = 4.71$ m so, the length of the lace = 4.71 m
Cost of 1 m lace = ₹ 15 [given] Cost of 4.71 m lace = ₹ $15 \times 4.71 = ₹ 70.65$

19.



Area of a parallelogram = Base \times Height

We have two altitudes and two corresponding bases.

$$\Rightarrow AD \times CF = CD \times AE$$

$$\Rightarrow 20 \times CF = 25 \times 10$$

$$\therefore CF = 12.5 \text{ cm}$$

Hence, the altitude corresponding to the other pair of the side AD is 12.5 cm.

20. 1 revolution (r= 10.5 inches) = circumference of tyre = $2\pi r = 2 \times 22/7 \times 10.5 = 66$ inches

$$350 \text{ revolutions} = 350 \times 66 = 23100 \text{ inches}$$

$$\text{Distance covered} = 23100 \text{ inches}$$

$$1 \text{ revolution (r=7 inches)} = 2 \times 22/7 \times 7 = 44 \text{ inches}$$

$$\text{Number of revolutions with tyre radius 7 inches covering 23100 inches}$$

$$= 23100/44 = 525 \text{ revolutions}$$

21.

Area of $\parallel\text{gm } ABCD$

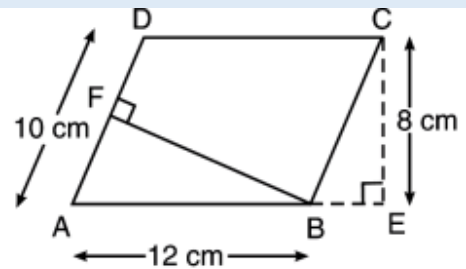
$$= \text{Base} \times \text{Altitude} = AB \times CE \quad \dots(i)$$

$$= 12 \text{ cm} \times 8 \text{ cm} = 96 \text{ cm}^2$$

Also, area of $\parallel\text{gm } ABCD = AD \times BF = 10 \times BF \quad \dots(ii)$

From (i) and (ii) $10 \times BF = 96$

$$\therefore BF = \frac{96}{10} \text{ cm} = 9.6 \text{ cm.}$$



22.

Ans: We have, $ABCD$ is a parallelogram with base $AB = 20 \text{ cm}$ and corresponding altitude DL . It is given that the area of the parallelogram $ABCD = 100 \text{ cm}^2$

Now,

Area of a parallelogram = Base x Height

$$100 \text{ cm}^2 = AB \times DL$$

$$100 \text{ cm}^2 = 20 \text{ cm} \times DL$$

$$\therefore DL = \frac{100 \text{ cm}^2}{20 \text{ cm}} = 5 \text{ cm}$$

Again by Pythagoras theorem, we have,

$$(AD)^2 = (AL)^2 + (DL)^2$$

$$\Rightarrow (13)^2 = (AL)^2 + (5)^2$$

$$\Rightarrow (AL)^2 = (13)^2 - (5)^2 = 169 - 25 = 144$$

$$\Rightarrow (AL)^2 = (12)^2 \Rightarrow AL = 12 \text{ cm}$$

Hence, length of AL is 12 cm .

5 MARKS QUESTIONS

23. $ABCD$ is a rectangle and $DEBF$ is a parallelogram,

Since $\triangle DAF \cong \triangle BCE$, therefore their areas will be equal. Area of $\triangle DAF = \triangle BCE = 24/2 \text{ cm}^2 = 12 \text{ cm}^2$

Area of rectangle = $l \times b = 10 \text{ cm} \times 6 \text{ cm} = 60 \text{ cm}^2$

Area of shaded region = Area of rectangle - Area of $\triangle DAF$ - Area of $\triangle BCE = (60 - 12 - 12) \text{ cm}^2 = (60 - 24) \text{ cm}^2 = 36 \text{ cm}^2$

Area of remaining part = Area of Rectangle - Area of shaded portion = $(60 - 36) \text{ cm}^2 = 24 \text{ cm}^2$

Ratio = Area of shaded portion: Area of remaining rectangle = $36:24 = 3:2$

24. From the question, it is given that Area of the circular flower garden = 314 m^2

The sprinkler at the centre of the garden can cover an area that has a radius = 12 m

Area of the circular flower garden = πr^2

$$\Rightarrow 314 = 3.14 \times r^2 \Rightarrow 314/3.14 = r^2 \Rightarrow r^2 = 100 \Rightarrow r = \sqrt{100} \Rightarrow r = 10 \text{ m}$$

\therefore Radius of the circular flower garden is 10 m .

The sprinkler can cover an area of a radius of 12 m.
Hence, the sprinkler will water the whole garden.

25. From the question, it is given that Diameter of the flower bed = 66 m
Then, Radius of the flower bed = $d/2 = 66/2 = 33$ m
Area of flower bed = $\pi r^2 = 3.14 \times 33^2 = 3.14 \times 1089 = 3419.46$ m now, we have to find the area of the flower bed and path together.
So, the radius of the flower bed and path together = $33 + 4 = 37$ m
Area of the flower bed and path together = $\pi r^2 = 3.14 \times 37^2 = 3.14 \times 1369 = 4298.66$ m
Finally, Area of the path = Area of the flower bed and path together – Area of the flower bed
= $4298.66 - 3419.46 = 879.20$ m²

CASE BASED QUESTIONS (4 MARKS QUESTIONS)

26) Fig 2

1. Ans. AREA = $b \times h = 20$ cm²
- ii. Ans. Perimeter = $12+8=20$ cm
- iii. Ans. BF = $30/6=5$ CM
AREA OF PARALLELOGRAM = $b \times h = 10 \times 5 = 50$ cm²

27) Rope = $2 \times 22/7 \times 21 = 132$ m
Cost = $132 \times 4 =$ Rs 528
Diameter including garden and foot path = $21 + 4 = 25$ m
Area of big circle = $22/7 \times 25/2 \times 25/2 = 484.4$ m²
Area of garden = $22/7 \times 21/2 \times 21/2 = 346.185$ m²
Area of the foot path = 138.215m
Cost = $138.18 \times 20 =$ Rs 2764.45

28.) Length of each side = $132/3 = 44$ cm
Area of square = $132/4 \times 132/4 = 1089$ cm²
Radius of circle = $(132 \times 7) / (2 \times 22) = 21$ cm
Area of circle = $22/7 \times 21 \times 21 = 1386$ cm²

29) Ans: From the question, it is given that AB = AC = 7.5 cm, BC = 9 cm, AD = 6cm
Then, Area of $\Delta ABC = \frac{1}{2} \times \text{Base} \times \text{Height}$
= $\frac{1}{2} \times BC \times AD = \frac{1}{2} \times 9 \times 6 = 1 \times 9 \times 3 = 27$ cm²
Now, Area of $\Delta ABC = \frac{1}{2} \times \text{Base} \times \text{Height}$
 $\Rightarrow 27 = \frac{1}{2} \times AB \times CE$
 $\Rightarrow 27 = \frac{1}{2} \times 7.5 \times CE$
 $\Rightarrow (27 \times 2)/7.5 = CE$
 $\Rightarrow CE = 54/7.5 \Rightarrow CE = 7.2$ cm

30). Radius = side /2 = $10/2 = 5$ m
Circumference = 31.4m
Ratio = $(100 \times 7) / (22 \times 25) = 700 / 550 = 70/55 = 14/11$

CHAPTER – 10 : ALGEBRAIC EXPRESSIONS

MULTIPLE CHOICE QUESTIONS

- Q1.** Which of the following is equal to $5c$? (AO1)
(a) $5 + c$ (b) $c + c + c + c + c$ (c) $c \times c \times c \times c \times c$ (d) $3c + 2c$
- Q2.** If $x = 5$, $y = 2$, what is the value of $13 - 2(8y - 6x)$? (AO1)
(a) 13 (b) -23 (c) 41 (d) -51
- Q3.** Expression for “5 less than 5 times an unknown number ‘z’” is _____. (AO1)
(a) $z - 5$ (b) $5z - 5$ (c) $5(z - 5)$ (d) $5 - 5z$
- Q4.** If Aashrit covers $20A$ cm in one step, then how many steps are required to cover $15AB$ meters. (AO2)
(a) $75A$ (b) $7.5A$ (c) $7.5B$ (d) $75B$
- Q5.** Lakshika has a long Ice Cream brick, If she cuts it into ‘a’ equal pieces, the length of each piece would have been ‘x’ cm. If she wants ‘b’ pieces, the length (in cm) of each piece would be (AO2)
(a) $\frac{xb}{a}$ (b) $\frac{ab}{x}$ (c) $\frac{a}{xb}$ (d) $\frac{ax}{b}$
- Q6.** What should be subtracted from $-5xy$ to get $5xy$? (AO2)
(a) $-10xy$ (b) $5xy$ (c) $10xy$ (d) $5xy$
- Q7.** Which of the following options is equal to $13x - 4 + 9y + 11$? (AO1)
(a) $22 + xy + 7$ (b) $22xy + 7$ (c) $9x + 20y$ (d) $13x + 9y + 7$
- Q8.** $6y^2$ can also be written as _____. (AO1)
(a) $6y + 6y$ (b) $y^2 + y^2 + y^2 + y^2 + y^2 + y^2$ (c) $6 \times (y + y)$ (d) $6 + y^2$

ASSERTION AND REASON QUESTIONS

Directions: Each of the following questions contain an Assertion (A) followed by a Reason (R). Read them carefully and answer the questions on the basis of the following options.

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

- Q9. Assertion (A):** The expression $5ab + 6$ is in two variables. (AO1)

Reason (B): In $5ab + 6$ are the two variables x and y .

Q10. Assertion (A): The product of $10y$ and 0 is 0 . (AO1)

Reason (B): Any value multiplied by zero is zero.

Q11. Assertion (A): The area of a rectangle whose length and breadth are $5x$ and $3x^2$ respectively is $15x^3$. (AO1)

Reason (B): Area of rectangle = length \times breadth.

Q12. Assertion (A): $23ab$ and $12bc$ are like terms. (AO1)

Reason(R): Terms which have the same algebraic factors are like terms.

2 MARKS QUESTIONS

Q13. Solve the following:
 $13xy + \underline{\hspace{2cm}} = 5xy$ (AO1)

Q14. Write an expression for “12 is subtracted from sum of y and -4 .” (AO1)

Q15. What is the value of expression $2x^2 + 5y^2 - 10xy - 17$, if $x = -1$, and $y = 1$? (AO1)

Q16. What is the value of $x^2 - y^2$, if $x = -4$ and $y = 6$? (AO1)

Q17. Identify whether the following expressions are monomial or binomial and also write the coefficient of x in the following: - (AO1)

(a) $3x^2 - 24x$

(b) $13x$

3 MARKS QUESTIONS

Q18. Kritvi and Tanveer have written two algebraic expressions i.e. $(14xy - 12y - 8x)$ and $(25xy + 14y - 4x)$. They have decided to subtract Kritvi’s expression from Tanveer’s expression. What will be the result if they do so? (AO1)

Q19. What should be the value of ‘ k ’, if $6x^2 + 2x + k = 12$, and $x = -1$ (AO1)

Q20. Mahesh had ₹ $(7x + 30)$ in his bank savings account. He again deposited ₹ $(17x + 25)$ in his account. One day his best friend Rohan requested him for ₹ $(3x + 20)$ for some urgent work, so he withdrew ₹ $(3x + 20)$ from his account to help his friend. How much money he is still having in his account? (AO2)

Q21. Rahul is working in an MNC, his monthly income is ₹ $(30x + 500)$. He spends ₹ $(15x + 1000)$ and saves the rest amount. What amount he saves every month?(AO1)

Q22. By how much $(5x - 8y)$ is greater than $(2x + 4y)$? (AO1)

5 MARKS QUESTIONS

- Q23.** What will be the result if we subtract – the difference of $(2x - 5b + 7)$ and $(x + 4b + 5)$ from the sum of $(10x - 9b + 3)$ and $(8x + 5b + 5)$? (AO2)
- Q24.** Vishal is working with an ice cream factory and selling ice creams at different places in his town. His company pays him a fixed salary of ₹ X every month and also a commission of ₹ Y for every ice cream sold by him.
In August 2024, Vishal sold 100 ice creams. How much his total earnings for August would be? (AO2)
- Q25.** Aarushi's mother orders N boxes of Chocolates for Diwali to be distributed among her friends. Each box contain 15 Chocolates. In one of the boxes, the Chocolates are found to be spoiled. Also, M Chocolates are found crushed and cannot be offered to friends. How many Chocolates can Aarushi's mother give to her for her friends? (AO2)

CASE BASED QUESTIONS (4 MARKS EACH)

- Q26.** Vikrant is an innovative farmer. He always tries to do new innovations in farming and grow healthy organic crops and fruits. He believes pesticides and fertilizers cause harm to environment and cause different types of diseases, so he follows organic farming. He has 10 acres of land and each acre of land is in rectangular shape. The length and breadth of each acre is represented by $(200x + 60)$ and $(20x + 6)$.



Based on the above case answer the following questions: -

- (a) What is the area of one acre of land? (AO1)
- (b) What is the perimeter of 1 acre of land (AO1)
- (c) What is total area of agricultural land Vikrant is having, if $x = 3$? (AO2)
- Q27.** To access the learning outcomes of students, mathematics teacher conducted a Maths test in class VII. Teacher made some statements and asked the students to express the statement algebraically.



Express the following as algebraic expressions: -

- (a) One fifth of the product of thrice of x and twice of y . (AO1)
- (b) A number multiplied by twice of itself. (AO1)
- (c) Sum of two numbers $2a$ and b subtracted from their product. (AO1)

Q28. On Monday Tanveer's school planned a trip to nearby orphanage. The students met the children living there. The manager of orphanage made the visiting students and teachers familiar with different type of problems those children were facing and what were their requirements and shortages. So he asked all the visitors to show soft corner for these needy children and donate something for the betterment of these children, for their studies etc. and smooth working of orphanage. So Tanveer and his 10 friends decided to donate ₹ $(7x + y)$ each from their pocket money. Also, they decided to persuade their parents for donation. Tanveer's parents also got convinced by his idea of donation and decided to donate ₹ $(100x + 50y)$ for orphan students.



Now based on above case/paragraph answer the following questions: -

- (a) What was the total amount donated by Tanveer and his family? (AO1)
- (b) What total amount was donated by Tanveer and his friends? (AO1)
- (c) How much money was donated by Tanveer and his family, if $x = 10$ and $y = 100$? (AO1)

Q29. Rishit, Abhigyan and Zara are best friends and are intelligent also. They study in Class VII. They always try to learn mathematical concepts in a fun way, like by playing

mathematical games and practice together and they score high marks in class. One day they decided to play games on algebraic expressions. They decided that each one of them should first write an algebraic expression and then solve the below mentioned questions. Rishit wrote $(3xy + 7)$, Abhigyan wrote $(5xy + 10y + 3)$ and Zara wrote $(20y + 30)$: -



- (a) What is the sum of all the expressions they wrote? (AO1)
- (b) What is the difference of sum of Rishit & Abhigyan’s expressions from Zara’s expression? (AO2)
- (c) What is the product of Rishit’s and Zara’s Expressions? (AO1)

Q30. On the occasion of world Environment Day (5th June), Harshit’s school is planning to plant saplings in an unused land around the school’s stadium. School’s management has decided to plant Neem and Peepal trees as these are best trees for environment and emits maximum oxygen and acts as filter for pollution. NCC and Bharat Scouts & Guides students were assigned duties to mark spots in rows and columns at equal distances. There were total $(5x + 7)$ rows and $(10x + 9)$ saplings to be planted in each row.



Now based on above case answer the following: -

- (a) What are the total number of saplings planned to be planted? (AO2)
- (b) If 39 saplings are planned per row, then find the value of variable used? (AO1)

(c) How many students are there in school, if total number of saplings were planted by all the students, 70 teachers and other staff members? (AO2)

SOLUTIONS CHAPTER – 10: ALGEBRAIC EXPRESSIONS
MULTIPLE CHOICE QUESTIONS

- Q1.** Ans. (b) $c + c + c + c + c$
Q2. Ans. (c)
Q3. Ans.(b) $5z - 5$
Q4. Ans. (d) 75B
Q5. Ans. (d) $\frac{ax}{b}$
Q6. Ans. (a) $-10xy$
Q7. Ans. (d)
Q8. Ans. (b) $y^2 + y^2 + y^2 + y^2 + y^2 + y^2$

ASSERTION AND REASON QUESTIONS

- Q9.** Ans: a) both assertion and reason are correct and reason is correct explanation for assertion.
Q10. Ans: a) both assertion and reason are correct and reason is correct explanation for assertion.
Q11. Ans: a) both assertion and reason are correct and reason is correct explanation for assertion.
Q12. Ans. (d) Assertion (A) is false, but Reason (R) is true.

2 MARKS QUESTIONS

- Q13.** Sol. $-8xy$
 $13xy + a = 5xy$
 $a = 5xy - 13xy = -8xy$
Q14. Sol. $[y + (-4)] - 12$
 $= y - 4 - 12$
 $= y - 16$
Q15. Sol. $2x^2 + 5y^2 - 10xy - 17$
 $= 2(-1)^2 + 5(1)^2 - 10(-1)(1) - 17$
 $= 2 \times 1 + 5 \times 1 + 10 \times 1 \times 1 - 17$
 $= 2 + 5 + 10 - 17$
 $= 17 - 17 = 0$
Q16. Sol. $x^2 - y^2$
 $= (-4)^2 - (6)^2$
 $= 16 - 36$
 $= -20$
Q17. Sol. (a) $3x^2 - 24x$
It is binomial and coefficient of x is -24
(b) $13x$

It is monomial and coefficient of x is 13

3 MARKS QUESTIONS

Q18. Sol. $25xy + 14y - 4x - (14xy - 12y - 8x)$
 $= 25xy + 14y - 4x - 14xy + 12y + 8x$
 $= 25xy - 14xy + 14y + 12y + 8x - 4x$
 $= 11xy + 26y + 4x$

Q19. Sol. $6x^2 + 2x + k = 12$
 $6(-1)^2 + 2(-1) + k = 12$
 $6 - 2 + k = 12$
 $4 + k = 12$
 $k = 12 - 4$
 $k = 8$

Q20. Sol. Total amount in Mahesh's account = $\text{₹}(7x + 30) + \text{₹}(17x + 25)$
 $= \text{₹}(7x + 30 + 17x + 25)$
 $= \text{₹}(24x + 55)$

Amount he withdrew for his friend = $\text{₹}(3x + 20)$

So, amount still available in his account = $\text{₹}(24x + 55) - \text{₹}(3x + 20)$
 $= \text{₹}(24x + 55 - 3x - 20)$

$= \text{₹}(21x + 35)$

Q21. Sol. Rahul's monthly income = $\text{₹}(30x + 500)$
Rahul's monthly expenditure = $\text{₹}(15x + 1000)$
So, his monthly saving = $\text{₹}(30x + 500) - \text{₹}(15x + 1000)$
 $= \text{₹}(30x + 500 - 15x - 1000)$
 $= \text{₹}(15x - 500)$

Q22. Sol. To find how much $(5x - 8y)$ is greater than $(2x + 4y)$, we need to subtract $(2x + 4y)$ from $(5x - 8y)$
 $= (5x - 8y) - (2x + 4y)$
 $= 5x - 8y - 2x - 4y$
 $= 5x - 2x - 8y - 4y$
 $= 3x - 12y$

5 MARKS QUESTIONS

Q23. Sol. Difference of $2x - 5b + 7$ and $x + 4b + 5$
 $= 2x - 5b + 7 - (x + 4b + 5)$
 $= 2x - 5b + 7 - x - 4b - 5$
 $= 2x - x - 5b - 4b + 7 - 5$
 $= x - 9b + 2$ ----- (1)

Sum of $10x - 9b + 3$ and $8x + 5b + 5$
 $= 10x - 9b + 3 + (8x + 5b + 5)$

$$\begin{aligned}
&= 10x - 9b + 3 + 8x + 5b + 5 \\
&= 10x + 8x - 9b + 5b + 3 + 5 \\
&= 18x - 4b + 8 \quad \text{-----(2)}
\end{aligned}$$

Subtracting Eq. (1) from Eq. (2)

$$\begin{aligned}
&= 18x - 4b + 8 - (x - 9b + 2) \\
&= 18x - 4b + 8 - x + 9b - 2 \\
&= 18x - x - 4b + 9b + 8 - 2 \\
&= 17x + 5b + 6
\end{aligned}$$

Q24. Sol. Vishal's per month salary = ₹ X

Commission he receives on selling an ice cream = ₹ Y

Number of ice creams he sold in the month of August = 100

So, his total earning for the month of August 2024 = Monthly salary + Bonus x 100

$$\begin{aligned}
&= ₹ X + ₹ Y \times 100 \\
&= ₹ (X + Y.100)
\end{aligned}$$

Q25. Sol. $15(N - 1) - M$

Number of chocolate boxes purchased by Aarushi's mother = N

Number of chocolates each box contains = 15 chocolates

Total number of chocolates in N boxes = $15 \times N = 15N$

Number of chocolates found spoiled = 1 box = 15 chocolate

Number of chocolates found crushed = M chocolates

So, the number of Chocolates her mother found good for distribution = Total number of chocolates – Number of chocolates found spoiled - Number of chocolates found crushed
 $= 15N - 15 - M = 15(N-1) - M$

CASE BASED QUESTIONS (4 MARKS EACH)

Q26. (a) Sol. Area of rectangular field = Length x Breadth

$$\begin{aligned}
&= (200x + 60) \cdot (20x + 6) \text{ ft}^2 \\
&= (200x)(20x) + (200x)(6) + (60)(20x) + (60)(6) \\
&= 4000x^2 + 1200x + 1200x + 360 \\
&= (4000x^2 + 2400x + 360) \text{ ft}^2
\end{aligned}$$

(b) Sol. Perimeter of rectangular field = $2(\text{Length} + \text{Breadth})$

$$= 2(200x + 60 + 20x + 6)$$

$$= 2(220x + 66)$$

$$= (440x + 132) \text{ ft}$$

(c) Sol. Area of 1 acre land = $(4000x^2 + 2400x + 360) \text{ ft}^2$

Area when $x = 3$,

$$= (4000(3)^2 + 2400(3) + 360) \text{ ft}^2$$

$$= (4000 \cdot 9 + 2400 \cdot 3 + 360) \text{ ft}^2$$

$$= (36000 + 7200 + 360) \text{ ft}^2$$

$$= 43560 \text{ ft}^2$$

Area of 10 acre land = $10 \cdot 43560$

$$= 435600 \text{ ft}^2$$

Q27. (a) Sol. $\frac{1}{5}(3x \cdot 2y)$

$$= \frac{1}{5}(6xy)$$

$$= \frac{6xy}{5}$$

(b) Sol. let the number be x

$$\text{So } x \cdot 2x = 2x^2$$

(c) Sol. Sum = $2a + b$

$$\text{Product} = 2ab$$

$$\text{Product} - \text{Sum} = 2ab - (2a + b)$$

$$= 2ab - 2a - b$$

Q28. (a) Sol. Total amount = ₹ $(7x + y) + ₹(100x + 50y)$

$$= 7x + y + 100x + 50y$$

$$= ₹ (107x + 51y)$$

(b) Sol. Amount donated by Tanveer and his friend = $11 \times ₹ (7x + y)$

$$= ₹ (77x + 11y)$$

(c) Sol. Amount donated by Tanveer and his family = ₹ $(107x + 51y)$

$$= ₹ (107(10) + 51(100)) \quad (x=10 \text{ and } y=100)$$

$$= ₹ (1070 + 5100)$$

$$= ₹ 6170$$

Q29. (a) Sol. Sum of Expressions = $(3xy + 7) + (5xy + 10y + 3) + (20y + 30)$
 $= 3xy + 7 + 5xy + 10y + 3 + 10y + 30$
 $= 3xy + 5xy + 10y + 20y + 30 + 7 + 3$
 $= 8xy + 30y + 40$

(b) Sol. Sum of Rishit's and Abhigyan's Expression = $3xy + 7 + 5xy + 10y + 3$
 $= 8xy + 10y + 10$

Difference of sum of Rishit & Abhigyan's expressions from Zara's expression

$$= (20y + 30) - (8xy + 10y + 10)$$

$$= 20y + 30 - 8xy - 10y - 10$$

$$= -8xy + 20y - 10y + 30 - 10$$

$$= -8xy + 10y + 20$$

(c) Sol. Product = $(3xy + 7) \cdot (20y + 30)$
 $= 60xy^2 + 90xy + 140y + 210$

Q30. (a) Sol. Total number saplings = Number of rows x number of trees planted in a row.

$$= (5x + 7) \cdot (10x + 9)$$

$$= 50x^2 + 45x + 70x + 63$$

$$= 50x^2 + 115x + 63$$

(b) Sol. Number of sapling each row: $- 10x + 9 = 39$

$$10x = 39 - 9$$

$$10x = 30$$

$$x = 3$$

(c) Sol. Total number of students in school

$$= \text{total number of saplings} - \text{number of teachers and staff}$$

$$= 50x^2 + 115x + 63 - 70$$

$$= 50(3)^2 + 115(3) + 63 - 70$$

$$= 50 \times 9 + 115 \times 3 + 63 - 70$$

$$= 450 + 345 + 63 - 70$$

$$= 858 - 70$$

$$= 788 \text{ students}$$

CHAPTER-11: EXPONENTS AND POWERS

MULTIPLE CHOICE QUESTIONS

1. $(4^2)^3$ is equal to: (A01)
a. 2^{12} c. 2^8
b. 4^7 d. 2^9
2. 729^0 is equal to: (A01)
a. 9^3 c. 1
b. 3^9 d. 0
3. The exponential form of 3125 is: (A01)
a. 5^2
b. 5^3
c. 5^4
d. 5^5
4. The value of -2^4 is : (A02)
a. -16
b. 16
c. 8
d. -8
5. Multiplicative inverse of $1/7$ is _____ (A01)
a. 49
b. 5
c. 7
d. -14
6. Any number raised to zero is? (A01)
a. 0
b. 1
c. $\frac{1}{2}$
d. None of these
7. Find the value of 11 raised to 2. (A02)
a. 22
b. 9
c. 121
d. 13

8. The value of (-1) raised to an even number is? (AO2)

- a. 1
- b. 0
- c. -1
- d. 2

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following:

- (a) Both assertion (A) and reason(R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason(R) are true but reason (R) is not the correct explanation of assertion(A)
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

9. Assertion: The exponential form of 10000 is 10^4

Reason: $10000 = 10 \times 10 \times 10 \times 10 = 10^4$ (AO2)

10. Assertion: The exponential form of 125 is 5^3 .

Reason: $125 = 5 \times 5 \times 5 = 5^3$ (AO2)

11. Assertion: $(-1)^3 = (-1)$

Reason: (-1) raised to any odd power is (-1) (AO2)

12. Assertion: $(-1)^4 = (-1)$

Reason: (-1) raised to any even power is $(+1)$. (AO2)

2 MARKS QUESTIONS

1. Write the reciprocal of $\left(\frac{-25}{4}\right)^2 \div 5^0$. (AO2)

2. Express 343 as a power of 7. (AO1)

3. Which is greater 3^2 or 2^3 ? (AO2)

4. Express the following number as a power of prime factors: (AO2)

- a. 144
- b. 225

5. Find the value of: (AO2)

- a. -1^{1000}
- b. 1^{250}

3 MARKS QUESTIONS

1. If $a \times 70^{40} = 7^{43} + 7^{42} - 7^{41} + 7^{40}$. Find a . (AO2)

2. Simplify the following and write in exponential form: (AO1)

(i) $(5^2)^3$

(ii) $(2^3)^3$

(iii) $(a^b)^c$

3. Simplify: $(3^2 \times 3^3) \div 3^4$ (AO1)
4. A class of students is arranging chairs in rows. Each row contains 6 chairs. If there are 7 rows of chairs, how many chairs are there in total? (AO2)
5. If a box contains 9 layers of books, and each layer has 8 books, how many books are in the box in total? (AO2)

5 MARKS QUESTIONS

1. The statements given below have numbers. Express them in the standard form. (AO1)
- a. The distance between the earth and the moon is 384,000,000 m
 - b. In a vacuum, the speed of light is 300, 000, 000 m/s
 - c. The earth has a diameter of 1,27,56,000 m
 - d. The sun has a diameter of 1,400,000,000 m
 - e. The average number of stars present in the galaxy is 100,000,000,000.
2. Write the following numbers given below in the expanded form: (AO1)
- a. 279404
 - b. 3006194
 - c. 2806196
 - d. 120719
 - e. 20068
3. If $x=5^2$ and $y=2^3$, find the value of $\frac{x^2 \times y}{x \times y^2}$ (AO2)

CASE BASED QUESTIONS

1. Scalpel is an instrument used by surgeons in surgery. During an experiment it was found that the size of the tip of the scalpel can affect the recovery rates of patients. Two scalpels of tip sizes 0.8 micrometer and 12.5 micrometer were tested.

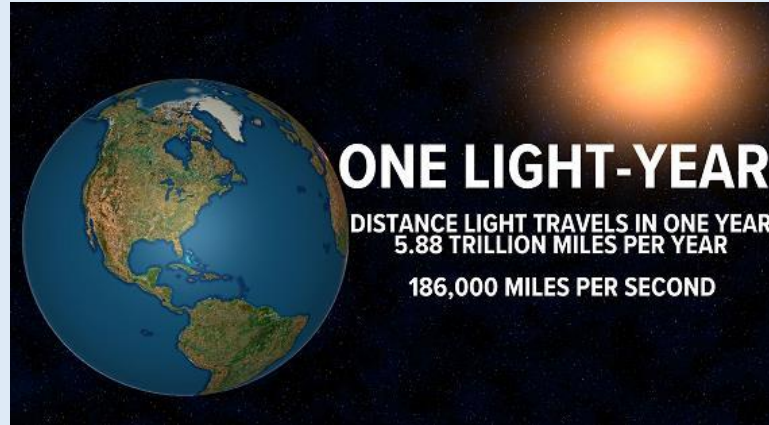


- a. What is the difference between the radii of the two tips in millimeters? (AO1)
- b. Express 9800000 nanometers in standard form. (AO1)

c. What is the ratio of 1m and 1 micro meter. (AO2)

2. A light-year is the distance light travels in one Earth year. For objects in space, we use light-years to describe the distance between two heavenly bodies.

One light-year is approximately 9,500,000,000,000 km (AO2)



a. Express one light year in meters

b. If a star is 5 light years away then the distance in standard form in km is?

c. Simplify $95^7 / (19 \times 5)^6$

3. Mohan divided a sum of rupees into two parts 5 raised to x and 4 raised to x and distributed it between his two sons, Parth and Ankur respectively. The product of 5 raised to x and 4 raised to x is 8000.

a. The amount of money received by Parth? (AO2)

b. The amount of money received by Ankur? (AO2)

c. What is the ratio of amount received by both of them? (AO1)

4. The mass of the earth is 5,976,000,000,000,000,000,000 Kg and the radius of the earth is 6.37×10^6 m.

Moon is the natural satellite of earth which revolves around the sun due to strong gravitational force of the earth. The mass of the moon is 7.36×10^{22} Kg. The radius of the moon is 1.74×10^6 m. The distance between the earth and moon is 3.84×10^5 km. (AO2)

a. Write the mass of earth in standard form?

b. Express the distance between earth and moon in m and find its square. Write your answer in standard form?

c. Express the double of difference of radius of earth and moon in standard form.

5. Once a crook came to a rich trader to trick him. He said, "I will give you one lakh rupees daily for one month (30 Days) if you will give me just one rupee for first day

and from next day you will give me double of what you give me on previous day.”

The greedy trader, without showing far-sightedness accepted the offer and signed
a contract (AO2)

- How much amount did the crook give to the trader in 30 days?
- How much is to be paid to the crook by the trader on the 10th day?
- Amount paid by the trader to the crook on 20th day is?

SOLUTIONS: CHAPTER-11: EXPONENTS AND POWERS

MULTIPLE CHOICE QUESTIONS

- A
- C
- D
- B
- 7
- B
- C
- A

ASSERTION AND REASON QUESTIONS

- 9.A 10.C 11.A 12.D

2 MARKS QUESTIONS

- 16/625
- $343=7 \times (7 \times 7)=7^3$
- 3^2
- a. $2^4 \times 3^2$ b. $3^2 \times 5^2$
- a. +1 b. 1

3 MARKS QUESTIONS

- a. $7^{40}=7^{43}+7^{42}-7^{41}+7^{40}$
a. $7^{40}=7^{40}(7^3+7^2-7^1+7^0)=7^{40}(386)$
Hence a=386
- i. 5^{15} ii. 2^9 iii. a^{bc}
- $(3^2 \times 3^3) \div 3^4 = 3^5 \div 3^4 = 3$
- Total number of chairs= number of rows x number of chairs in 1 row
 $=6 \times 7=42$ chairs
- Total number of books= number of books in 1 row x number of rows= $9 \times 8=72$ books

5 MARKS QUESTIONS

- a. 3.84×10^8 b. 3×10^8 c. 1.2756×10^7 d. 1.4×10^9 e. 1.0×10^{11}
- a. $2 \times 10^5 + 7 \times 10^4 + 9 \times 10^3 + 4 \times 10^2 + 4 \times 10^0$

- b. $3 \times 10^6 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 4$
 - c. $2 \times 10^6 + 8 \times 10^5 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 6$
 - d. $1 \times 10^5 + 2 \times 10^4 + 7 \times 10^2 + 1 \times 10^1 + 9$
 - e. $2 \times 10^4 + 6 \times 10^2 + 8$
3. $\frac{x^2 \times y - 5^4 \times 2^3}{x \times y^2} = \frac{5^2 \times 2^3}{5^2 \times 2^6} = 25/8$

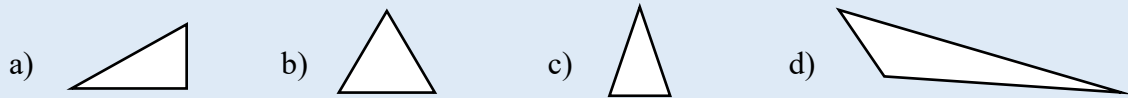
CASE BASED QUESTIONS

- 1.
- a. 4.5 micro meter or 0.045 mm
 - b. 9.8×10 raised to 6
 - c. 1/1000000
- 2.
- a. 9.5×10 raised to 15 m
 - b. 4.75×10 raised to 13
 - c. 95
- 3.
- a. 125
 - b. 64
 - c. 64/125
- 4.
- a. 5.976×10 raised to 24 kg
 - b. 1.47×10 raised to 16 sq. m
 - c. 9.26×10 raised to 6
- 5.
- a. 30 lakh
 - b. 512
 - c. 524288 or 2 raised to 19

CHAPTER 12: SYMMETRY

MULTIPLE CHOICE QUESTIONS

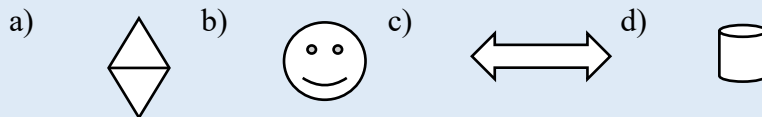
1. Identify the triangle which has only one line of symmetry and has no rotational symmetry of order of more than 1. (AO1)



2. If p = number of lines of symmetry of a square and q = number of lines of symmetry of a rectangle, then (AO1)

a) $p < q$ b) $q > p$ c) $p > q$ d) $p = q$

3. Identify the shape which does not have rotational symmetry. (AO1)



4. Which of these alphabets have rotational symmetry of order more than 1? (AO1)

a) A b) S c) M d) C

5. Which among the following is matched correctly? (AO1)

Shape	No. of lines of	Order of rotational
a)	4	2
b)	2	2
c)	2	0
d) Square	4	2

6. A regular pentagon has rotational symmetry of order 5. What is its angle of rotation? (AO1)

a) 60° b) 45° c) 72° d) 90°

7. A circle haslines of symmetry

(AO1)

a) 0 b) 4 c) many d) 2

8. After rotating about an angle of 72° , a figure looks exactly the same as its original position.

At which other angle is this possible?

(AO1)

a) 60° b) 145° c) 216° d) 210°

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following .

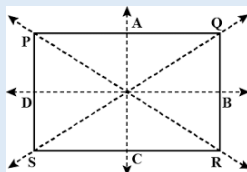
- (a) Both assertion (A) and reason(R) are true and R is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason(R) are true but R is not the correct explanation of A
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

9. Assertion : A pentagon has 5 lines of symmetry (AO1)
Reason : A pentagon is a polygon having 5 sides.
10. Assertion : A rhombus has rotational symmetry of order 2 (AO1)
Reason : A rhombus fits into its original position 2 times during a complete rotation.
11. Assertion : Square has both line symmetry and rotational symmetry. (AO1)
Reason : A shape having line symmetry also has rotational symmetry
12. Assertion : A rectangle has 2 lines of symmetry . (AO2)
Reason : Since every rectangle is also a parallelogram , no. of lines of symmetry of parallelogram is also 2.

2 MARKS QUESTIONS

13. Observe the biscuit shaped figure and name the lines which are not the lines of symmetry.

(AO1)

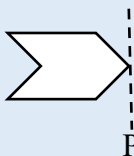


14. During a complete rotation, at what angles does a square look the same as its original position? (AO1)
15. Rini needs to know the number of lines of symmetry of the following figures . Rahul helps her in determining the same. What are their findings ?

(AO1)

Square , Rhombus , Circle , Parallelogram

16. Given the line of symmetry as p , complete the figure by drawing its mirror image. (AO1)

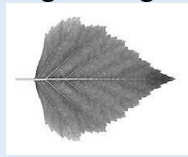


17. Illustrate a shape exhibiting rotational symmetry of order 3 along with the 3 different positions for the same. (AO2)

3 MARKS QUESTIONS

18. Raj claims that rotational symmetry of order 1 implies that there is no rotational symmetry. Do you agree with his claim ? Justify. Name any one shape exhibiting this property. (AO2)

19. Draw the line of symmetry in the given figures. (AO1)



20. Name any 3 shapes which do not have line symmetry .

(AO1)

21. What is the order and angle of rotational symmetry in the following shapes?

(AO1)



A



B



C

22. Sketch the following .

(AO2)

- A triangle with 3 lines of symmetry
- A quadrilateral with line symmetry but no rotational symmetry
- A quadrilateral with no line symmetry but having rotational symmetry

5 MARKS QUESTIONS

23. Anuj prepares a cube in which the letters F, V, I, J, C, U appear on the faces of the cube.

He puts forth few questions to himself and tries to answer them, thus reinforcing his learning. Here are his questions. Help him in providing the answers. (AO1)

- Only the letter C among the above has horizontal line of symmetry – True or false ?
- What fraction of these letters exhibit line symmetry ?
- Which letter has both line and rotational symmetry ? What is its order of symmetry ?
- Name any 2 English alphabets having rotational symmetry . Also write their angles of rotation .

24. Regular polygons have equal sides and equal angles.

- Do all regular polygons have line symmetry ? If yes, name any 1 such polygon with its number of lines of symmetry. (AO2)
- Explain the validity of the statement: “All regular polygons possess rotational symmetry” taking examples of any three regular polygons. (AO2)

25. Anju was revising her chapter on symmetry . She solved the following questions for practice . What will be her answers ?

- Sketch the lines of a symmetry of a regular pentagon . (AO1)

- ii) What is the minimum number of lines of symmetry necessary for a shape to also possess rotational symmetry? (AO1)
- iii) Name 2 quadrilaterals which exhibit both reflectional and rotational symmetry. (AO1)

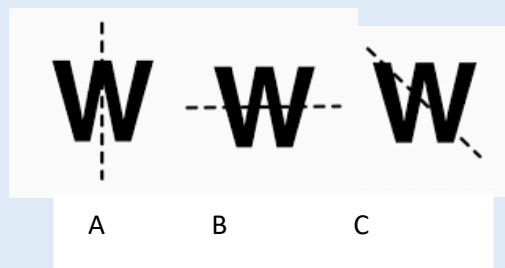
CASE BASED QUESTIONS(4 MARKS EACH)

26. The Universal Recycling symbol is internationally recognized for recycling activity. Both filled and outline versions are in use. To raise awareness of environmental issues, contests on designing the Universal designing symbol are held. The logo is usually displayed with the arrows circulating clockwise. The triangle in the figure is made up of three arrows drawn as a continuous loop.



- a) How many times does this logo coincides with the original position in one full rotation ? (AO1)
- b) What is the direction of rotation of logo - clockwise or anticlockwise ? (AO1)
- c) Does the logo show rotational symmetry ? Two students discuss the order of rotational symmetry of recycling logo. Rini says it is 2, while Rana says it is 3. Who is correct? Justify the correct answer. (AO2)

27. Mohan writes 'W' on a tracing paper 3 times and draws lines vertically, horizontally and diagonally as shown in the following figures. He then folds the paper along the lines and gets two parts of alphabet W.



- a) Do the two parts coincide with each other in the first figure ? (AO1)
- b) Rohan concludes that the letter W has only vertical line of symmetry, but no horizontal or diagonal lines of symmetry. Explain how Rohan arrived at this conclusion. (AO1)
- c) Rohan makes one full rotation of the letter W and says that W does not have rotational symmetry. Is Rohan correct ? Justify. (AO2)

28. The left side of an object appears to be the right side in the mirror. When the driver of the front vehicle sees the word "AMBULANCE" in the rear view mirror, he can see the inverted image of the word and read it correctly giving way to the Ambulance.

- a) The vertical mirror images of the letters B and E change, but their horizontal mirror images remain same. Why? (AO1)
- b) Which are the alphabets in the word ‘AMBULANCE’ that have no line of symmetry. (AO1)
- c) Name the only four English alphabets which remain unchanged when we take their horizontal as well as vertical mirror images. (AO1)



29. A snowflake is a single ice crystal that has a sufficient size and falls through the Earth’s atmosphere as snow. Snow appears white in colour, despite being made of clear ice. Snowflakes are formed in varied varieties of intricate shapes, and no two shapes are alike.

Observe the snowflakes given in the above picture and then answer the following questions.

- a) Do snowflakes possess symmetry? If yes, what type of symmetry? (AO1)
- b) How many lines of symmetry are there for the snowflakes shown above? (AO1)
- c) What is the order and angle of rotational symmetry for each of these snowflakes? (AO1)



30. Sumit visited Taj Mahal in Agra and was elated to visualise its natural beauty and symmetry. He thinks of the types of symmetry possible in this beautiful monument.

- a) What type of line of symmetry does Taj Mahal possess? (AO1)
- b) Does it have rotational symmetry? (AO1)
- c) Name any 2 other Historical monuments possessing line symmetry. (AO 2)



SOLUTIONS OF CHAPTER – 12: SYMMETRY

MULTIPLE CHOICE QUESTIONS

- | | | | |
|------------------|-------------------|-------------|--------------------|
| 1. (c) | 2. (c) $p > q$ | 3. (b) | 4. (b) S |
| 5. (b) rectangle | 6. (c) 72° | 7. (c) many | 8. (c) 216° |

ASSERTION AND REASON QUESTIONS

9. (d) 10. (a) 11. (c) 12. (c)

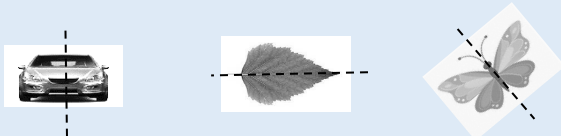
2 MARKS QUESTIONS

13. PR and QS
14. 90^0 , 180^0 , 270^0 , 360^0
15. Square- 4, Rhombus-2, Circle - many, Parallelogram- 0
16. completing the figure
17. equilateral triangle or any suitable eg. with 3 positions of the figure

3 MARKS QUESTIONS

18. Yes, I agree. Reason – Every shape /object attains its original position after 1 complete rotation
Eg : stone, scalene triangle, almond, key .. etc

19.



20. scalene triangle, parallelogram, trapezium, hexagon, pentagon (any3)
21. A) order = 2, angle = 180^0 B) order = 4, angle = 90^0 C) order = 6, angle = 60^0
22. correct figures

5 MARKS QUESTIONS

23. a) false b) $4/6$ or $2/3$ c) I, order = 2 d) H, X, angle = 180^0
24. a) yes, square – 4 or equilateral triangle – 3
b) equilateral triangle (order = 3), square (order = 4), regular pentagon (order = 3) etc have rotational symmetry
25. i) correct figure ii) minimum 2 lines iii) square, rectangle

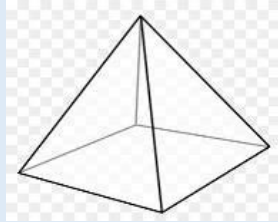
CASE BASED QUESTIONS (4 MARKS EACH)

26. a) 3 times b) clockwise
c) yes. Rana is correct because the figure comes to its original position 3 times in one rotation.
27. a) Figure A
b) When folded along the dotted lines, only the parts of figure A coincide with each other. Hence letter W has only vertical line of symmetry
c) Yes, Rohan is correct. Letter W comes into its original position only after one complete rotation and hence W does not have rotational symmetry
28. a) B and E b) L and N c) H, I, O, X
29. a) yes, both line and rotational symmetry b) 6 lines c) order = 6, angle = 60^0 .
30. a) vertical line of symmetry b) no c) Any 2 examples

CHAPTER - 13: VISUALISING SOLID SHAPES

MULTIPLE CHOICE QUESTIONS

Q1. How many edges does the following figure have? (AO1)

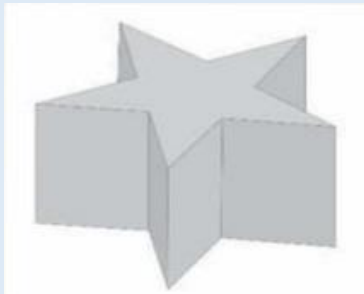


- a) 12 b) 8 c) 6 d) 4

Q2. Seema has two cubes of dimensions $3\text{ cm} \times 3\text{ cm} \times 3\text{ cm}$, she placed these cubes side by side, what would be the dimensions of resulting cuboid? (AO2)

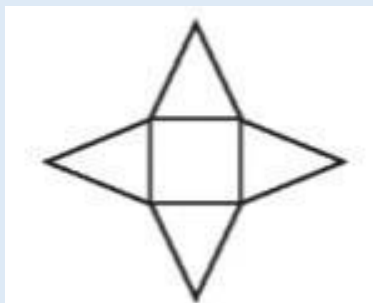
- a) $6\text{ cm} \times 6\text{ cm} \times 6\text{ cm}$
b) $12\text{ cm} \times 12\text{ cm} \times 12\text{ cm}$
c) $9\text{ cm} \times 6\text{ cm} \times 3\text{ cm}$
d) $6\text{ cm} \times 3\text{ cm} \times 3\text{ cm}$

Q3. Ravina gives toy erasers as return gifts for her birthday. One of the erasers is shown below. How many edges are there? (AO1)



- a) 17 b) 20 c) 25 d) 30

Q4. Name the solid whose net diagram is given below(AO2)



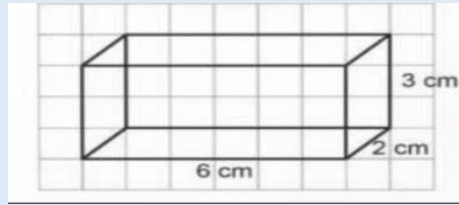
- a) Pyramid b) cone c) cube d) cuboid

Q5. Rakesh has 10 one rupee coins of similar kind. He put them exactly One on the other. What shape will he get finally?(AO2)

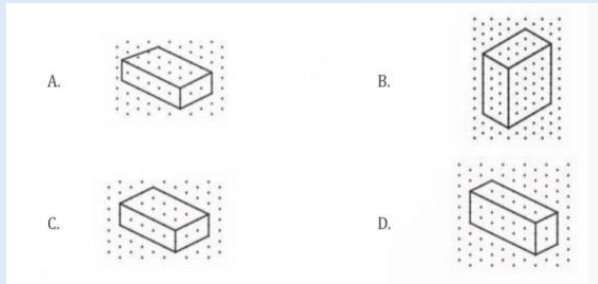
- a) Circle b) cylinder c) cube d) cone

Q6. A cuboid with given sides is shown below.

(AO1)



Which of the following can be another way of representing the cuboid?



Q7. The number of vertices of a cone is

(AO1)

- (a) 1 b) 6 c) 2 d) 3

Q8. Which of the following is a 3D shape

(AO1)

- a) Square b) Rectangle c) Cylinder d) Circle

ASSERTION AND REASON QUESTIONS

Choose the correct option from the following .

- (c) Both assertion (A) and reason(R) are true and R is the correct explanation of assertion (A).
(d) Both assertion (A) and reason(R) are true but R is not the correct explanation of A
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Q9. Assertion: A cone is a solid figure.

Reason: A cone is generated when rectangular sheet is rotated about its axis.

(AO2)

Q10. Assertion: 7edges does a pyramid with square base have

(AO2)

Reason: A square pyramid is a two -dimensional geometric shape that has a square base and four triangular faces that are joined at a vertex

Q11. Assertion: A cube has 4 faces

(AO1)

Reason: A cube is a three-dimensional solid object bounded by six square faces, facets or sides, with three meeting at each vertex.

Q12. Assertion: In a polyhedron if $F = 6$, $V = 8$ then $E = 12$

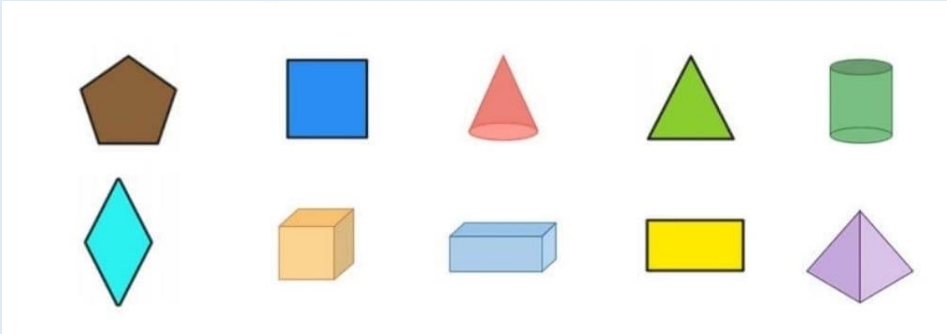
(AO2)

Reason: For any polyhedron, $F + V - E = 2$ where 'F' stands for number of faces, V stands for number of vertices and E stands for number of edges

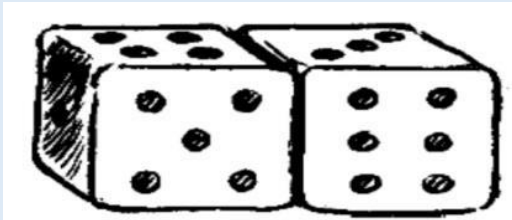
2 MARKS QUESTIONS

Q13. Shyam has a basketball & a chalk, what cross-sections will he get if he gives Horizontal cut to these objects? (AO2)

Q14. Circle the 3-D shapes below (AO1)



Q15. Two dice are placed side by side as shown in below figure. What the total would be on the face opposite to (a) 5 + 6 (b) 4 + 3



(AO2)

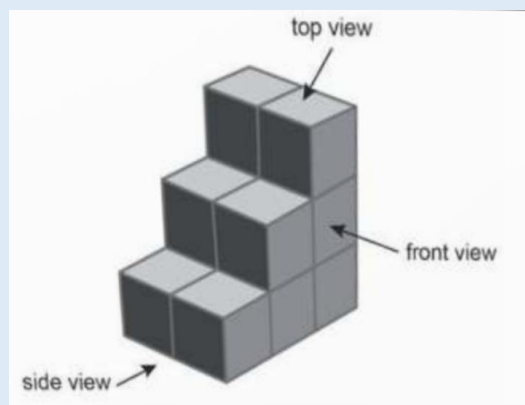
Q16. Name the different plane shapes needed to draw the net of (AO2)

- a) a cube b) a triangular prism

Q17. Write any four name of the objects which we use in our daily life and those are in cube shape. (AO1)

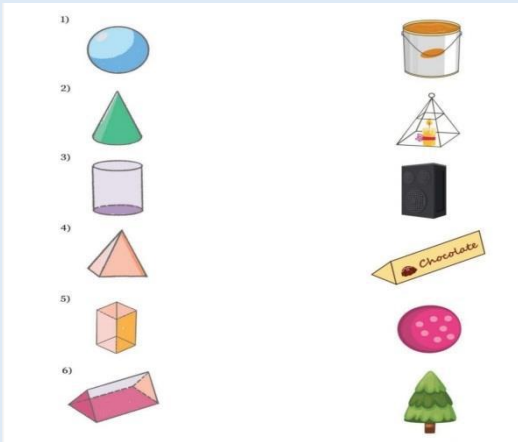
3 MARKS QUESTIONS

Q18. For given solid, draw the top view, front view and side view. (AO1)



Q19. Match the 3D shapes with real life examples



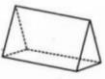
(AO1)



Q20. How many vertices, edges and faces will a cuboid have? What is the shape of its faces? (AO2)

Q21. Draw the top view, front view and side view of a square pyramid. (AO2)











Q22. Complete the following table (AO1)

Figure	No. of Faces	No. of Edges	No. of Vertices
(i) 	10
(ii) 	5
(iii) 	9

5 MARKS QUESTIONS

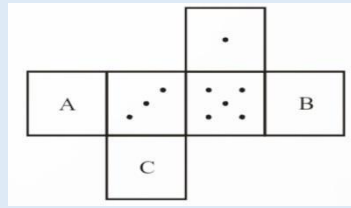
Q23. Match the nets with appropriate solids (AO2)

(AO2)

Column I	Column II
(i) 	(a) 
(ii) 	(b) 
(iii) 	(c) 
(iv) 	(d) 
(v) 	(e) 

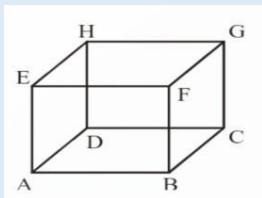
Q24. Net of dice is given below, answer the following questions:

(AO2)



- i) Find the number of dots on the face C of the dice?
- ii) Find the number of dots on the face B of the dice?
- iii) Find the sum of dots on the faces A and B of the dice?
- iv) What is the sum of dots on opposite faces of a die?
- v) What is the ratio of the number of dots on the face A to face C?

Q25. From the given figure answer the following questions:(AO2)



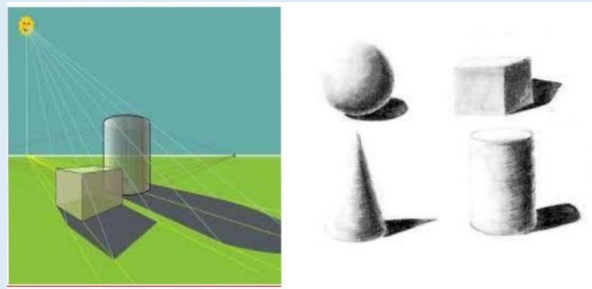
- i) Which edge is the intersection of faces EFGH and EFBA?
- ii) Which faces intersect at edge FB?
- iii) Give all the edges that are perpendicular to edge AB.
- iv) Give four vertices that do not all lie in one plane.
- v) Find the ratio of the number of edges to the number of vertices in this figure.

CASE BASED QUESTIONS (4 MARKS EACH)

Q26. Rhea witnessed a shadow dance in Zedlands got talent. As she was learning about 3D shapes in school she decided to find out the shadows the shape would cast on a wall. Before trying them out herself she decided to deduce the 2D shapes she could make with the 3D shapes she had.

i) What shadows will be cast by a ball (Sphere)?(AO1)

ii) What shadows will be cast by a cylindrical container? (AO1)



iii) Cone cast two type of shadow one is triangle .Other will be (AO2)

iv) Can a Rubik’s Cube cast three different type of Shadow? [AO2]

Yes / No

Q27. Shikamaru and his friends were playing Ludo when one of them lost the dice. Too lazy to go out and get it, Shikamaru decided to make a new dice at home with cardboard and glue. He gave a part of cardboard to each of his 5 friends who were playing and told them to make a net of a dice. He also informed them that Dice are special number cubes for which the following rule applies: The total number of dots on two opposite faces is always seven. When his friends returned the cut out cardboards Shikamaru found that not all of the nets could be made into dice. Help Shikamaru identify which of the following nets can be made into a die by folding

Que No	Net made by his friends	Is a net of cube?	Is a net of Dice?
1.		YES /NO	YES /NO
2.		YES /NO	YES /NO
3.		YES /NO	YES /NO
4.		YES /NO	YES /NO

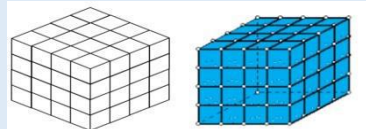
Q28. In a cube of dimension “n”

(AO1)

- Number of cubes having no surface painted = $(n - 2)^3$
- Number of cubes having one surface painted = $(n - 2) \times 6$
- Number of cubes having two surfaces painted = $(n - 2) \times 12$
- Number of cubes having three surface painted = number of vertex of the cube.
- There cannot be a cube which has more than three surface painted

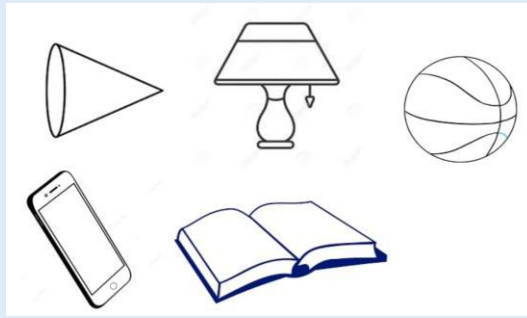
A cube of 4 x 4 in single colour is made up of 64 small cubes. After the arrangement it is painted with blue colour

i) How many cubes have no coloured face at all?



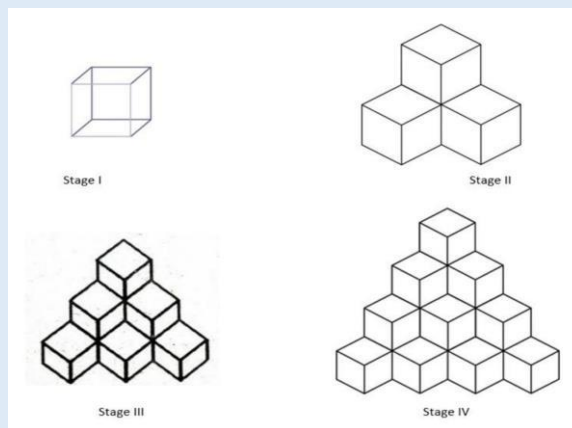
- How many cubes have one blue coloured face?
- How many cubes have two blue coloured face?
- How many cubes have three blue coloured face?

Q29. A hanging focus light is suspended from the ceiling. Its light beam falls on these objects. (AO1)



- i) What is the shape of the shadow formed by an open book?
- ii) What is the shape of the shadow formed by a table lamp?
- iii) Which of the given objects casts a triangular shaped shadow?
- iv) What is the shape of the shadow formed by a basketball?

Q30. Arman likes to build step pattern using from small identical cubes like the one shown in the following diagram: Arman has lots of small cubes. He uses glue to join cubes together to make other blocks pattern as shown below.



He uses one cube for stage I, four cubes for stage II.

- i) How many cubes will he use for stage III? (AO2)
- ii) How many cubes will he use for stage IV? (AO2)
- iii) How many number of squares will be there in top view of this stage II arrangement? (AO1)
- iv) Are the numbers of squares in the top view, side view and front view the same? Yes / No (AO1)

SOLUTIONS OF CHAPTER - 13: VISUALISING SOLID SHAPES

MULTIPLE CHOICE QUESTIONS

- Q1. b
Q2. d
Q3. d
Q4. a
Q5. b
Q6. d
Q7. a
Q8. C

ASSERTION AND REASON QUESTIONS

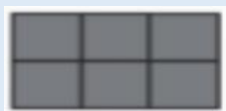
- Q9. c
Q10. d
Q11. d
Q12. A

2 MARKS QUESTIONS

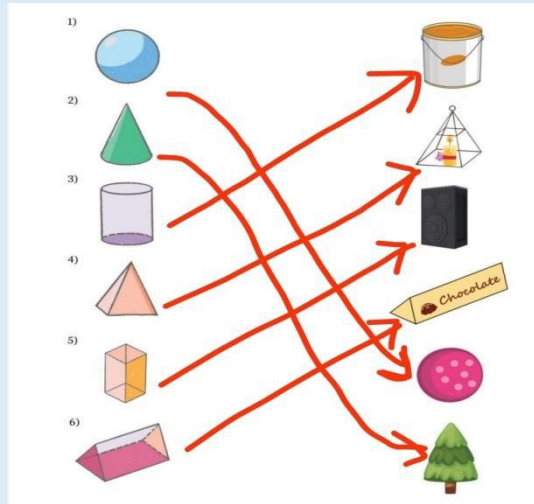
- Q13. i) Basketball - Circle ii) Chalk - Rectangle
Q14. Identify and circle
Q15. We know that sum of the numbers or dots on the opposite faces of a dice is 7
Therefore, i) sum of opposite to 5 + 6 will be = $2 + 1 = 3$
Similarly ii) sum of opposite to 4 + 3 will be = $3 + 4 = 7$
Q16. a) Squares b) Triangles & rectangles
Q17. Write any four

3 MARKS QUESTIONS

- Q18. Top view Front view side view



Q19.



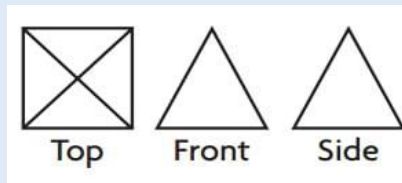
Q20. No. of vertices = 8

No. of edges = 12

No. of faces = 6

The shapes of its faces are rectangles.

Q21. Top view, front view and side view of a square pyramid are:



Q22. i) no. of faces = 7, no. of edges = 15

ii) no. of edges = 8, no. of vertices = 5

iii) no. of faces = 5, no. of vertices = 6

5 MARKS QUESTIONS

Q23. i) – (e)

ii) – (a)

iii) – (b)

iv) – (c)

v) – (d)

Q24. i) 6 , ii) 4 , iii) 6 , iv) 7 , v) Ratio is $12: 8 = 3:2$

Q25. i) EF ii) ABEF & BFGC

iii) AE , BF , AD , BC iv) A , E , C , B (Group of pairs may differ)

CASE BASED QUESTIONS (4 MARKS EACH)

Q26. i) Circle ii) Rectangle iii) Circle iv) Yes

Q27. 1) Net of a dice 2) Net of a cube 3) Net of a cube 4) Net of a cube

Q28. i) No. of cubes no coloured faces = $(4 - 2) \times 3 = 6$

ii) No. of cubes have one blue coloured face = $(4 - 2) \times 6 = 24$

iii) No. of cubes have two blue coloured face = $(4 - 2) \times 12 = 24$

iv) No. of cubes have three blue coloured face = no. of vertices = 6

Q29. i) Rectangle ii) Circle iii) Cone iv) Circle

Q30. i) 10 ii) 20 iii) 1 iv) Yes
