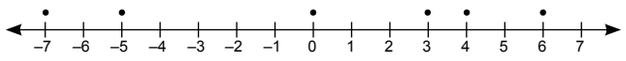
Class: 7 KEY ANSWERS Term: 1

Chapter - 1 Integers

Exercise: 1.1

1.

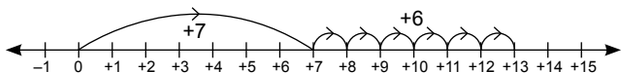


2. a) +2 > 0 b) +5 > –5 c) –2 > –3
d) +2 < +3 e) 0 > –1 f) –1 < 0
g) –7 < +7 h) –6 > –9

Exercise: 1.2

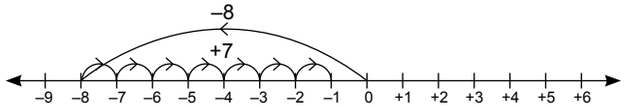
1.

a)



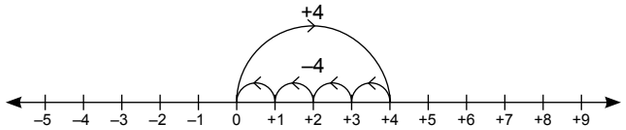
(+7) + (+6) = 13

b)



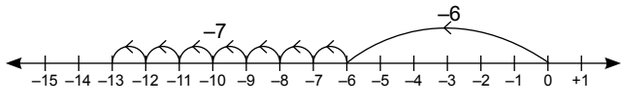
(–8) + (+7) = –1

c)



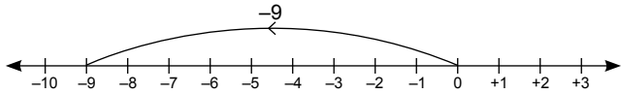
(+4) + (–4) = 0

d)



(–6) + (–7) = –13

e)



(–9) + 0 = –9

2. a) 11 b) –13 c) –16 d) –9 e) –123

3. a) –8 < –5 < –3 < 0 < +6
b) –11 < –9 < –1 < +7 < +8
c) –8 < –6 < 0 < +6 < +8
d) –87 < –26 < –3 < +5 < +79
e) –13 < –2 < 0 < +1 < +21

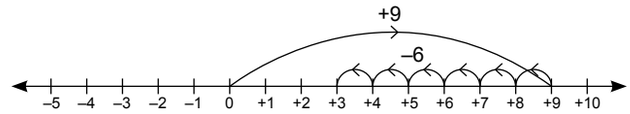
4. a) (–5) + (+15) = 10°c
b) (+8) + (+7) = 15°c
c) (+8) + (–10) = –2°c

5. (–2) + (+22) = 20th floor

Exercise: 1.3

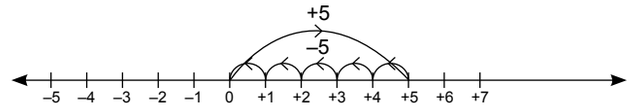
1.

a)



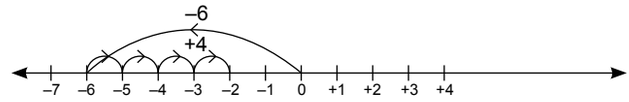
(+9) + (–6) = 3

b)



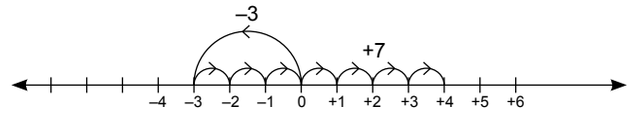
+5 + (–5) = 0

c)



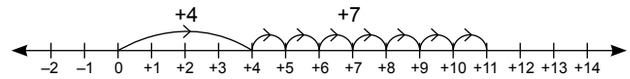
(–6) + (+4) = –2

d)



(–3) + (+7) = +4

e)



(+4) + (+7) = +11

2. 306 + 550 – 408 = 448

$$\begin{array}{rr} 306 & 856 \\ +\ 550 & -\ 408 \\ \hline 856 & 448 \end{array}$$

3. 9 – 3 = 6 meters (height of ledge from ground)

4. 7200 – 8540 = –1340 meters (minus sign indicates depth since '0' in the ground level)

Exercise: 1.4

1. a) –224 b) +133 c) +700
d) –270 e) +120

2. a) +157520 b) –132500 c) –218800
d) –64464 e) +25530

3. a) $321 \times (1000 + 3) = 32100 + 963 = 321963$
b) $(1000 - 3) \times 83 = 83000 - 249 = 82751$
c) $(100 - 1) \times 63 = 6300 - 63 = 6237$
d) $(1000 - 2) \times (100 + 2) = 100000 + 2000 - 200 - 4 = 101796$
e) $81 \times (1000 + 1) = 81000 + 81 = 81081$

Exercise: 1.5

1. Points sania gained in first round = +35
Points sania loses in second round = –44
Points sania gained in third round = +30
Final score = +35 – 44 + 30 = 21 points.

2. a) –8 b) +1 c) –9 d) +5

3. Rate at which submarine desconds = 60 feet/minute. Tiem taken to sescend 660 feet = $\frac{660}{60}$ = 11 minutes.

4. Rent of room per month = ₹500. Share that each person should pay = $\frac{500}{4}$ = ₹125.

5. Negative marks for wrong answers = 2 marks.
Positive marks for correct answers = 4 marks.
Total marks neerav gets for 15 correct and 4 wrong.
Answers = $(15 \times 4) - (5 \times 2)$
$= 60 - 10 = 50$ marks
Total mark Rajan gets for 14 correct answers.
$= 14 \times 4 = 56$ marks
Rajan got more marks in (56 – 50) = 6 marks more than Neerav.

6. Cost of each torch = ₹55.50 paise.
Cost of 48 torches = 48×55.50
$= (50 - 2) \times (55 + 0.50)$
$= 2750 + 25 - 110 - 1$
= ₹2664.

7. $(-8) \times (+9) + (-11) \times (-6)$
$= (-72) + (66)$
$= -6$

8.

+	0	+1	+2	+3	+4
–5	–5	–4	–3	–2	–1
–4	–4	–3	–2	–1	0
–3	–3	–2	–1	0	+1
–2	–2	–1	0	+1	+2

Chapter - 2 MEASUREMENTS

Exercise: 2.1

1. $2(l + b)$

2. 4 times (3×6)
in perimeter = $4 \times 3 \times 6 = 72$ cm

3. $4 \times 3 \times 3 = 36$ cm

4. a) $6 + 3 + (6 - 1) + (7 - 3) = 18$ cm
b) $6 + 1 + (10 - 1) + (6 - 1) = 21$ cm
c) $8 + 3 + 3 + 3 + 2 + 3 + 1 + 3 + 2 + 12 = 40$ cm

5. Perimeter of equalateral triangle = $3 \times 6 = 18$ cm
Perimeter of regular hexagon with side 'x' = $6x$ = 18 cm
$\therefore$ length of side of regular hexagon, $x = \frac{18}{6} = 3$cm

6. Perimeter of Rectangle = $2(l + w)$
$= 2(8 + 2) = 20$ cm
Perimeter of square with side 'a' = $4a$ = 20 cm
Side, $a = \frac{20}{4} = 5$ cm

Exercise: 2.2

1. area = $35 \times 35 = 1225$ cm^2

2. length, l = 6.32 cm,
breadth, b = 3.65 cm
area = $l \times b = 6.32 \times 3.65 = 23.068$ m^2

3. Perimeter = 16 cm

L	W	A	Figure
7	1	7	R
6	2	12	R
5	3	15	R
4	4	16	S

Perimeter = 20 cm

L	W	A	Figure
9	1	9	R
8	2	16	R
7	3	21	R
6	4	24	R
5	5	25	S

Perimeter = 24 cm

L	W	A	Figure
11	1	11	R
10	2	20	R
9	3	27	R
8	4	32	R
7	5	35	R
6	6	36	S

R - Rectangle S - Square

Questions:

a) We get more area when sides are comparable length and have more area when it is equal square.

b) Yes square with side = 4 cm
Perimeter = $4 \times 4 = 16$ cm
Area = 42 = 16 cm

c) Yes

L	W	A	P
4	4	16	16
6	2	16	20

d) Yes

4. a) $A = \frac{1}{2} \times 6 \times 5 = 15$

b) $A = \frac{1}{2} \times (3 + 1) \times 4 = 8$

c) $A = \frac{1}{2} \times 12 \times 5 = 30$

d) $A = \frac{1}{2} \times 24 \times 24 = 288$

5. $A = \frac{1}{2} \times 4 \times 10 = 20$ cm^2

6. $A = \frac{1}{2} \times 12 \times 4 = 24$ sq.ft.

7. $A = \frac{1}{2} \times 18 \times 9 = 81$ cm^2

8. $A = \frac{1}{2} \times b \times 6 = 30 \Rightarrow b = 10$ cm

9. $A = \frac{1}{2} \times 2 \times h = 96 \Rightarrow h = 96$ cm

10. Perimeter of square garden = 4×40
= 160 cm
Cost of fencing/meter = ₹85.
$\therefore$ Total cost = 85×160 = ₹13600.

11.

Wall	l	b	A	number	area
1	4	3.5	14	2	28 m^2
2	3.5	3	10.5	2	21m^2

Total area = 49 m^2
Rate = 55 per sq.m
$\therefore$ Cost of painting = 49×55
= $(50 - 1)(50 + 5)$
= $2500 + 250 - 50 - 5$
= ₹2695

12. Area = $\frac{1}{2} \times 1.5 \times 2.3 = 1.725$ m^2

13. Perimeter, 4a = 400 m
Side, a $\frac{400}{4}$ = 100 m
Area, $a^2 = 100^2 = 10000$ m^2

14. Perimeter of square, = $4 \times 20 = 80$ cm
if length of rectangle = 16 cm.
then breadth of rectangle = 24 cm
a) length of wire = perimeter of square = 80 cm.
b) Area of square = $20^2 = 400$ cm^2.

c) Area of rectangle = $16 \times 24 = 384$ cm^2.

Exercise: 2.3

1.

Figure	Dimension	Area	Formula
Square	a = 4 cm	16 cm^2	(a^2)
Rectangle	l = 6 cm b = 4 cm	24 cm^2	($l \times b$)
Triangle (1)	b = 3 h = 4	6 cm	($\frac{1}{2} b \times h$)
Triangle (2)	b = 3, h = 4 b = 4cm, h = 2cm	4 cm^2	($\frac{1}{2} \times b \times h$)

Total area = 50 cm^2

2.

Figure	Dimension	Area	Formula
Triangle	b = 2 cm h = 2 cm	2 cm^2	($\frac{1}{2} \times b \times h$)
Square	a = 2 cm	4 cm^2	(a^2)
Rectangle	l = 4 cm b = 2 cm	8 cm^2	($l \times b$)

Total area = 14 cm^2

3.

Figure	Dimension	Area	Formula
Rectangle	l = 8 cm b = 3 cm	24 cm^2	($l \times b$)
Triangle	b = 8 cm h = 3 cm	12 cm^2	($\frac{1}{2} \times b \times h$)

4. a) A= $\frac{1}{2} \times b \times h = \frac{1}{2} \times 5 \times 12 = 30$ cm^2

b) A= $a^2 = 13^2 = 169$ cm^2

c) A= $a^2 = 5^2 = 25$ cm^2

d) A= $a^2 = 12^2 = 144$ cm^2

5.

Figure	Dimension	Area	Formula
Square	a = 20 cm	400 cm^2	(a^2)
Triangle	b = 20 cm h = 14 cm	140 cm^2	($\frac{1}{2} \times b \times h$)

Total area = 540 cm^2

Exercise: 2.4

1. A = $b \times h = 22 \times 6 = 132$ cm^2.

2. A = $b \times h = 12 \times 5 = 60$ m^2.

3. A = 72 = $b \times b = b \times 9 \Rightarrow b = \frac{72}{9} = 8$ cm.

4. b = 12 cm, A = 108 cm^2 $\Rightarrow$ height, $h = \frac{108}{12} = 9$ cm.

5. d_1 = 16 m, d_2 = 30 m A = $\frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 16 \times 30 = 240$ m^2.

Both Rhombos has same area.

6. Perimeter of rhombus = 60 cm

$$\text{Side, } a = \frac{60}{4} = 15 \text{ cm.}$$

$$d_1 = 15 \text{ cm}, d_2 = 20 \text{ cm}$$

$$\text{Area} = \frac{1}{2} \times 15 \times 20 = 150 \text{ cm}^2$$

Exercise: 2.5

1. A = $\frac{1}{2} \times (6.6 + 12.4) \times 6 = \frac{1}{2} \times 9 \times 6 = 57$ cm^2

2. A = $\frac{1}{2} \times (4.5 + 9) \times 8 = 54$ cm^2

3. A = $\frac{1}{2} \times (a + b)\, h$

a) A = $\frac{1}{2} \times (21 + 24) \times 6 = 135$ cm^2

b) A = $\frac{1}{2} \times (1.8 + 2.4) \times 1.5 = 3.15$ m^2

c) A = $\frac{1}{2} \times (1.8) \times 1.2 = 1.08$ m^2

4. A = 225 cm^2

$(a + b)$ = 27 cm

A = $\frac{1}{2}(a + b)\, h \Rightarrow h = \frac{2A}{a + b} = \frac{2 \times 225}{27} = 16.67$

5. A = 125.5 cm^2

a = 7.7 cm

b = 12.3 cm

$h = \frac{2A}{(a + b)} = \frac{2 \times 125.5}{(7.7 + 12.3)} = \frac{251}{20} = 12.55$ cm

6. Area, A = 65 cm^2,

h = 13 cm

a = 6.3 cm

$A = \frac{1}{2}(a+b)h = \frac{1}{2}(6.3+b)\times 13 = 65$

$b = 3.7$ cm

More Exercise: 2.6

1. length of rectangular ground, $l = 65$ m

breadth of rectangular ground $b = 32$ m

Area $= l \times b = 32 \times 65 = 2080$ m^2

Rate for levelling = ₹3/m^2.

Total cost for levelling $= 3 \times 2080$

= ₹6240

2. Dimensions of room

length = 9 m

breadth = 7 m

Side of square tile = 0.9 m

Area of a square tile = $0.9^2 = 0.81$ m^2.

Number of tiles required = 77.78 tiles.

Rate of tiles = ₹8/tile

Cost of tiling $= \frac{8\times 63}{0.81} = 622.2$

₹622.2

3. Perimeter of the square countryard = 144 m

Side of courtyard $= \frac{144}{4} = 36$ m.

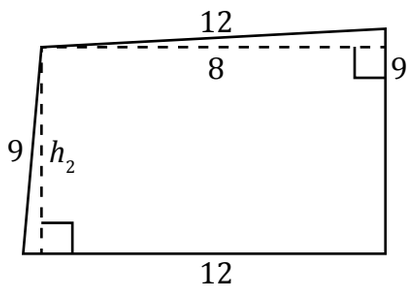
Area of square courtyard $= 36^2 = 1296$ m^2.

Rate of cementing = ₹660/m^2

Cost of cementing $= 6.60 \times 1296$

= ₹8553.6.

4. Distance between shorter sides ie. 9cm sides = 8cm



$\therefore$ Area of parallelogram $= 8 \times 9 = 72$cm^2

Area = distance between longer side $\times$ length longer side

ie. $72\text{cm}^2 = h_2 \times 12$

$h_2 = \frac{72}{12} = 6$cm

5. Diagonals of the rhombus are $d_1 = 40$cm and $d_2 = 25$cm

Area of rhombus $= \frac{1}{2}\times d_1 \times d_2 = \frac{1}{2}\times 40 \times 25$

$= 500\text{cm}^2$

Rate of polishing = ₹5.50/cm^2

Cost of polishing $= 5.50 \times 500 =$ ₹2750

6. Given $a = 20$cm, $b = 26$cm, $h = 18$cm

Area $= \frac{1}{2}(a+b)h = \frac{1}{2}(20+26)\times 18$

$= 414\text{cm}^2$

7. Trapezium ADCE

Parallel sides: AE and DC

Non parallel sides: AD and CE

Area of trapezium $= \frac{1}{2}\times(6+3)\times 6\,(\frac{1}{2}(\overline{AE} + \overline{DC})\times\overline{AD})$

$= 27\text{cm}^2$

Chapter - 3 ALGEBRA

Exercise: 3.1

1.

#	coefficient of x	constant term
(a)	2	–7
(b)	14	–11
(c)	–7	–3
(d)	2	0

2.

#	Type of polynomial	Degree
(a)	M	3
(b)	M	1
(c)	M	3
(d)	M	3
(e)	M	2
(f)	B	2

(g)	B	2
(h)	B	2
(i)	T	3
(j)	B	3

Where

M - Monomial

B - Binomial

T - Trinomial

Exercise: 3.2

I. 1. 27 2. –11784 3. –4092

4. 10 5. 10

II. a. $a = 2, b = 1$

1.	$a^2 + b^2 + 2ab = 4 + 1 + 4 = 9$	$(a + b)^2 = (2 + 1)^2 = 9$
2.	$a^2 - 2ab + b^2 = 4 - 4 + 1 = 1$	$(a - b)^2 = (2 - 1)^2 = 1$
3.	$(a + b)(a - b) = 3 \times 1 = 3$	$a^2 - b^2 = 4 - 1 = 3$
4.	$a^3 - b^3 = 23 - 13 = 7$	$(a - b)(a^2 + ab + b^2) = (1)(4 + 2 + 1) = 7$
5.	A3 + b^3 = 23+13 = 9	$(a + b)\ (a^2 - ab + b^2) = (3)\ (4 - 1 + 1) = 9$

b. $a = 11$ $b = 18$

	LHS	RHS
1.	$a^2 + b^2 + 2ab = 121 + 64 - 176 = 9$	$(a + b)^2 = 32 = 9$
2.	$a^2 - 2ab + b2 = 121 + 176 + 64 = 361$	$(a - b)^2 = 192 = 361$
3.	$(a + b)\ (a - b) = 3 \times 19 = 57$	$a^2 = b^2 = 121 - 64 = 57$
4.	$a^3 - b^3 = 1331 + 512 = 1843$	$(a + b\ )\ (a^2 + ab + b^2) = 19 \times (121 - 88 + 64) = 1843$
5.	$a^3 + b^3 = 1331 - 512 = 819$	$(a + b)\ (a^2 - ab + b^2) = 3 \times (121 + 88 + 64) = 819$

III. 1. area = $l \times b = 4 \times 3 = 12$ cm^2

Perimeter = 2 $(l + b)$ = 2(4 + 3) = 14cm

2. area = $l \times b = 12 \times 7 = 84$cm^2

Perimeter = $2(l + b) = 2(12 + 7) = 38$cm

IV.

#	Dimensions	Volume = $l \times b \times h$	Surface area = $2(lb + bh + hl)$
1.	l = 5cm, b = 4cm, h = 3cm	$5 \times 4 \times 3 = 60$cm^3	$2(5 \times 4 + 4 \times 3 + 3 \times 5) = 2(20 + 12 + 15) = 94$cm^2
2.	l = 15cm, b = 7cm, h = 2cm	$15 \times 7 \times 2 = 210$cm^3	$2(15 \times 7 + 7 \times 2 + 2 \times 15) = 2(105 + 14 + 30) = 298$cm^2

V. 1. 2 cubed = $23 = 2 \times 2 \times 2 = 8$

3 squared = $32 = 3 \times 3 = 9$

2. thrice $7 = 3 \times 7 = 21$

7 cubed = $72 = 7 \times 7 \times 7 = 343$

3. $5x$ = 5 times x

$x^5 = x \times x \times x \times x \times x$

If $x = 2$ then $5x = 10$ $x^5 = 25 = 32$

4. Area = a^2 if $a = 16$ then Area = $16^2 = 256$

VI. 1. a. 2×2 2. b. 5

3. b. 1 4. b. 1

5. c. 25 6. a. 75

7. b. 1 8. b. –6

9. a. 6 10. b. 5

Exercise: 3.3

I. 1.

My age	My son's age
$2x$	x
5 years hence $(2x + 5)$	$(x + 5)$
4 years before $(2x - 4)$	$(x - 4)$

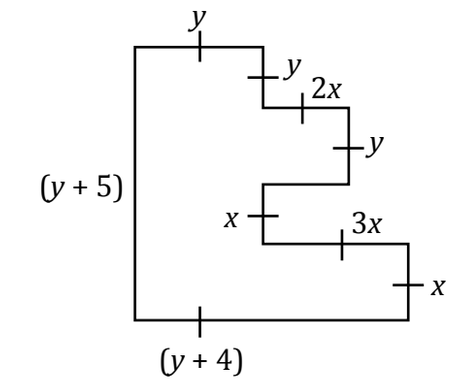
II. 1) $2(x + 3)$

2) $4x + 2y + 14$

3) Data missing $(8x + 4y + 9)$

4) $2x + 4y + 6$

5) $4(x + y)$



$(8x + 4y + 9)$

III.

#	Expression (simplified)	# of terms	Variables	Constants
1.	$4b - a$	2	a, b	-
2.	$-5a + 17c + 3$	3	a, c	3
3.	$a^2 - 14a - 10b + 15c$	4	a, b, c	-
4.	$7a - 5d$	2	a, d	-
5.	$xyz + 15$	2	x, y, z	15

IV. 1. Let pens be 'x' and 'y' be pencil, expression $= 11x + 5y$

2. Perimeter of rectangle $= 2(x + y + z) = 2x + 2y + 4$

3. Let red ball be 'x' and green ball be 'y'

Total number of balls $= 4x + 5y$

Two green balls removed

Total number of balls $= 4x + 3y$

4. a. $6x^2 + 13xy^2$

b. $-3a - 6b + 18$

c. $-8x - 11y + 7$

d. $9a^2b - 3ab^2 - 2ab$

V. 2. $6a + b$

3. $4x + 10y$

4. abc

5. $8x + 27y$

6. $2xyz - 8$

VI. 1. d. 0

2. a. $2a, -3a$

3. a. $-2x, -3y$

4. c. $4a$

Exercise: 3.4

I. 1. $x = 3$ 2. $x = -1$ 3. $x = \frac{7}{2}$

4. $x = 6$ 5. $x = 9$ 6. $z = 8$

7. $x = 3$ 8. $a = -12$ 9. $x = 2$

10. $y = \frac{-48}{5}$

II. 1. $x = -2$ 2. $y = -5$ 3. $x = 30$

4. $x = \frac{-3}{2}$ 5. $x = 7$

III. 1. c. 10 2. a. 8 3. b. $(5x = -10)$

4. d. none 5. b. $-x = 2$

IV.

1. $(9x - 5) - (2x + 2) = 9x - 2x - 5 - 2 = 7x - 7 = 7(x - 1)$

2. Let x be the number

Given $\frac{x - 9}{2} = 4 \Rightarrow x - 9 = 8 \Rightarrow x = 17$

3. Let the largest number be x

$x + (x - 1) + (x - 2) = 72 \Rightarrow 3x - 3 = 72$

$\Rightarrow x - 1 = 24$

$\Rightarrow x = 25$

Largest number is 25

4. Let age of Aaron be x

Then age of Rony is $x + 5$

Four years later $2(x + 4) = x + 9$

$\Rightarrow 2x + 8 = x + 9 \quad \Rightarrow x = 1$

Present age of aaron = 1 year

Present age of Rony = 1 + 5 = 6 years

5. Let the number of boys be 'x', then number of girls is $(x + 8)$

Given condition $\frac{3}{5x} = \frac{1}{5}(x + 8)$

$\therefore 2x = 8 \Rightarrow x = 4$

No. of boys $= x = 4$ boys

No. of girls $= x = 12$ girls

Total students $= (12 + 4) = 16$ students

6. Let breath of rectangle be 'b' then length $l = b + 5$, Perimeter of the rectangle

$p = 2(l + b)$

$= 2(b + 5 + b) = 4b + 10$

Given P = 50cm $\Rightarrow 4b + 10 = 50 \Rightarrow 4b = 40$

$\Rightarrow b = 10$cm

Length of rectangle = $b + 5 = 15$cm

Breath of rectangle = $b = 10$cm

7. Let side of square be 'a'

   Perimeter, $4a = 64$

   $\therefore a = 16$cm

   Side of square, $a = 16$cm

8. Let after 'x' years father's age will be double that of son the

   $(40 + x) = (12 + x) \times 2 \Rightarrow 40 + x = 24 + 2x$

   $\Rightarrow x = 16$

   After 16 years fathers age will be 56 and son age will be 28, (half the age of father)

9. length = 7cm width = $(x - 8)$

   Area = $7 \times (x - 8) = 42\text{cm}^2 \Rightarrow x - 8 = 6 \Rightarrow x = 14$

10. Let the number be 'x'

    Condition: $\frac{3}{5}x = 4 + \frac{1}{2}x \Rightarrow (\frac{3}{5} - \frac{1}{2})x = 4$

    $(\frac{6-5}{10})x = 4 \Rightarrow x = 40$

    The number is 40

H.O.T.S:

1. Let Anand age be 'x', them sister age is $x = 2$, father age is $x + 25$

   Given $x + (x + 2) + x + 25) = 53 \Rightarrow 3x + 27 = 53$

   $3x = 26 \Rightarrow x = \frac{26}{3}$

   Anand age is $\frac{26}{3}$ and Father'sage is $\frac{101}{3}$

2. Let breadth of rectangle be 'b'

   Then length = $b + 3$

   Area of rectangle = $b(b + 3)$

   Length and breadth is increased by 2 cm

   $\therefore$ New length = $b + 5$

   Breadth = b + 2

   New area = $(b + 5)(b + 2)$

   New area = old area + 70

   $\Rightarrow b^2 + 7b + 10 = b^2 + 3b + 70$

   $\Rightarrow 4b = 60$

   $\Rightarrow b = 15$ cm

   $\therefore$ length = $b + 3 = 18$ cm

   breadth = $b = 15$ cm.

Chapter - 4 DIRECT AND INVERSE PROPORTION

Exercise: 4.1

1. a. 4:5 = 8:10 = 40:50 = 12:15

   b. 3:4 = 9:12 = 30:40 = 12:16

2. Teacher student ratio is

   50:800 = 1:16 (in school)

   5:20 = 1:4 (in daycare)

   (kids need more care)

3. a. 25000:300 = 250:3

   b. 4000:250=16:1

   c. 5000:700 = 50:7

4. a. 1000:200 = 5:1

   b. 190:1000 = 19:100

   c. 200:950 = 4:19

5. a. They are not equivalent $\frac{6}{8} \neq \frac{16}{12}$

   6 bags of rice and 8 bags of sugar is equal to 12 bags of rice and 16 bags of sugar

   b. $\frac{1}{5} \neq \frac{2}{20}$ They are not equivalent

   1 train every 5 minutes to 4 trains every 20 minutes are equivalent

6 a. $56 \times \frac{2}{7}$ and $56 \times \frac{5}{7}$ ie. 16 and 40 students.

   b. $3500 \times \frac{3}{5}$ and $3500 \times \frac{2}{5}$ ie. 2100 and 1400

   c. $2 \times \frac{13}{12}$ and $2 \times \frac{9}{12}$ ie $\frac{1}{2}$ hrs and $1\frac{1}{2}$ hrs

7. a. In Proportion

   b. Not in proportion 3:4 and 150:200 are in proportion

c. Not in Proportion 16:256 and 11:176 are in proportion

8. a. $x = 11$ b. $y = 9$ c. $a = 0.2$

9.

Mangoes	Weight	Mangoes	Weight
4	$\frac{2800}{3}$	11	$\frac{7700}{3}$
7	$\frac{4900}{3}$	15	3500
10	$\frac{7000}{3}$	12	2800

10. a. Total eggs = $10 \times 2 = 120$ eggs
Number of cracked eggs = 25
Ratio of good eggs to cracked eggs is 95:25 ie. 19:5

b. 1:21::30: x then $x = 21 \times 30 = 630$ students

c. Copper to tin ratio is 3:1 ratio used for production x : 40

copper used $x = 40 \times 3 = 120$ gms

Exercise: 4.2

1. Time taken = $\frac{620}{10} \times 10 = 310$ minutes

2. Total time taken = 1 hr 45 min = 105 min

Fuel consumed = $105(\text{min}) \times 240(\frac{\text{lt}}{\text{mm}}) =$ 25200lt.

3. Let the number of days in a month be 30 days. Therefore total energy consumption ina month = $30 \times 2 = 60$kwhr

4. Time taken to cover 2km is 2000m = $\frac{2000}{4} \times 5$ = 2500mm

Distance farred in 4 hours = 240 min = $\frac{240}{5} \times 4$ = 192m

5. News paper printed in 1 hr is 2000 news paper.

Therefore in 8 hrs 16000 newspapers will be printed.

Exercise: 4.3

1. a. Inverse variation

b. Direct variation

c. They are not in proportion

2. a.

x	$\frac{85}{8}$	24	$\frac{17}{8}$	16	3.4	$\frac{119}{80}$	0.4
y	25	$\frac{960}{17}$	5	$\frac{640}{17}$	8	3.5	$\frac{16}{17}$

b.

a	3.6	12	8	90	20	6
b	100	30	45	4	18	60

c.

x	7	2.5	5	15	60	21.6
y	8.4	3	6	18	72	25.92

3. 1. d) ₹693

2. (inverse variation) c) 60 days

3. c) ₹10,000

4. c) 200km

5. b) 100kg

6. $\frac{30}{6} \times 25 = 125$ day of work

7. $48 \times 45 = 36 \times x \Rightarrow x = 60$km/hr. (Inverse variation)

8. Inverse variation $35 \times 8 = 20 \times x$

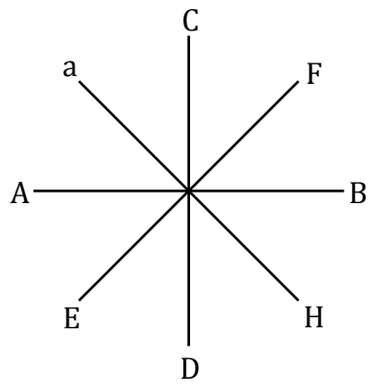
$x = 14$ is it will take 14 days.

Chapter - 5A GEOMETRY

Exercise: 5.1

1. a. $\angle$FOB and $\angle$BOH

b. $\angle$AOD and $\angle$BOD



2. ∠AOE and ∠EOB and adjacent angles
They have common arm OE

3. a. 90 degree b. 180°
c. 90 degree d. 180°

Exercise: 5.2

1. XY ⊥ YZ

∴ ∠XYO + ∠OYZ = 90°

∠XYO + 25° = 90°

∠XYO = 65°

2. ∠POA + ∠*y* + ∠*x* + ∠BOR = 180°

(∠AOB = 180°)

∠*x* + ∠*y* = 180 – 34 – 35 = 111°

∠*x* = 111° – 51° = 60°

3. PQ is straight line

Therefore ∠QOY + ∠x + ∠POS = 180°

∠*x* = 170° – 95° – 60° = 25°

XY is also a straight line

Therefore ∠*y* = 60° [Vertical opposite angles]

OR ⊥ OP ∠*y* + ∠*z* = 90°

∠*z* = 90° – 60° = 30°

4. $\overleftrightarrow{CD}$ is a straight line

ie. ∠*x* + ∠EOB + ∠BOD = 180°

∠*x* = 180° – 69° – 55° = 56°

EF is a straight line

ie. ∠*y* +∠BOD + ∠EPB = 180°

∠*y* = 180 – 69 – 55 = 56

∠*x* = ∠*y*

[vertical opposite angles are equal]

Exercise: 5.3

1. a. ∠*b* = 180 – 105 = 75 [Linear pairs]

∠*a* = 75 = ∠*b* [Corresponding angles]

∠*d* = 105 [corresponding angles]

∠c = 180 – 105 [Linear pair]

b. ∠1 = 180 - 90 = 90 [Linear pair]

∠4 = ∠1 = 90 [corresponding angle]

∠2 and ∠3 cannot be found from the given information.

c. ∠*c* = 120 [corresponding angles]

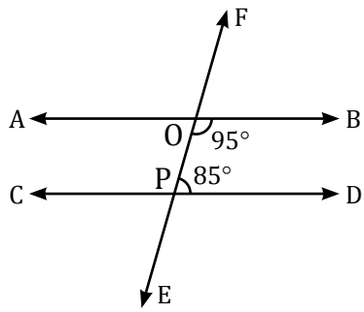
∠*a* = 180 – 120 [Linear pair]

∠*b* = ∠*a* = 120 [vertically opposite angles]

2. a. ∠FOB = 180 – 95 = 85 [Linear pair]

∠FOB = ∠OPD = 85

Therefore $\overleftrightarrow{BA}$ AB is || to $\overleftrightarrow{CD}$

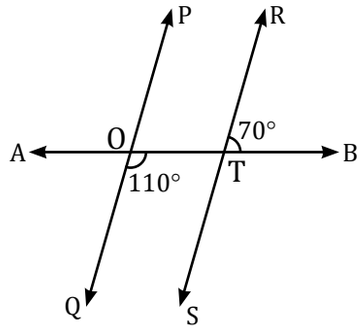


b. ∠BTR = 70

Therefore ∠BTS = 180 –70 = 110 [Linear pair]

∠BTS = ∠TOQ = 110

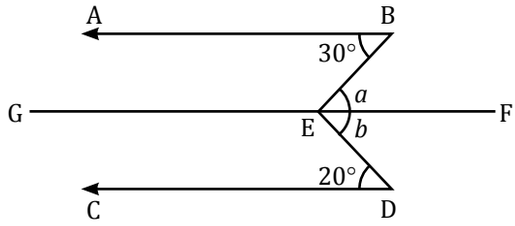
∴ $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ are || because corresponding angles are equal.



3. Draw a line AF || to AB and CD through E

Therefore $\angle a = 30$ $\angle b = 20$ – alternate interior angles are equal.

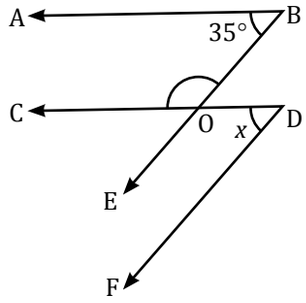
$\angle x = \angle a + \angle b = 30 + 20 = 50$



4. $\angle BOD = 35$ [AB||CD, CBOD and $\angle OBA$ are alternate interior angles]

$\angle y = 180 - 35 = 145$ [Linear pair]

$\angle x = \angle BOD = 35$ [BE || DF, BOD and $\angle x$ are alternate interior angles]



5. $\angle x = 120°$ [BC || EF, BCE and $\angle x$ are corresponding angles]

$\angle y = 120$ [AB || CD?-BCE and $\angle y$ are alternate interior angles]

6. Extend the edges of parallelogram as shown in figure.

$\angle EAB = 180° - 108° = 72°$ [Linear pair]

$\angle x = \angle EAB = 72$ [AD || BC, $\angle EAB$ and $\angle x$ are alternate interior angles]

$\angle CBG = 108$ [AD || BC, $\angle CBG$ and $\angle DAB$ are corresponding angles.]

$\angle y = \angle CBG = 108$ [DC || AB, $\angle$ y and $\angle CBG$ are alternate interior angles.

Opposite angles of a parallelogram are equal.

Chapter - 5B PRACTICAL GEOMETRY

Exercise: 5.4

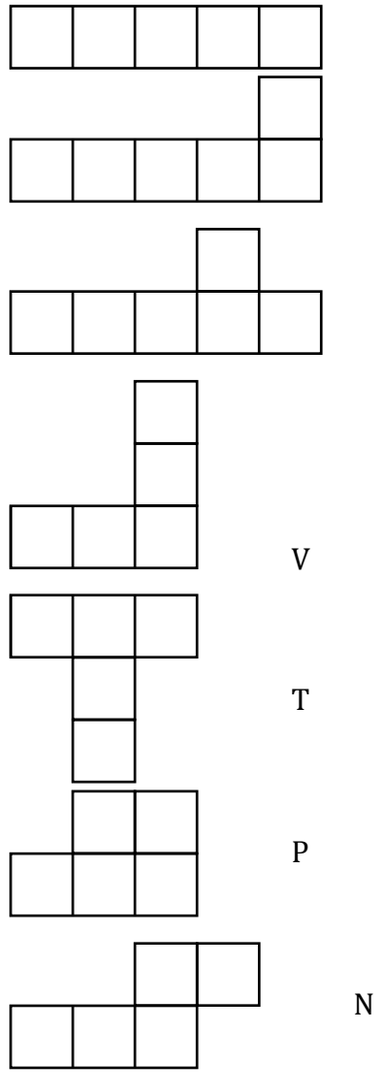
Student's work

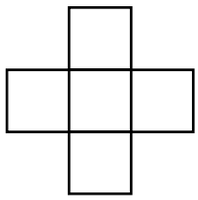
Chapter - 6 INFORMATION PROCESSING

Exercise: 6.1

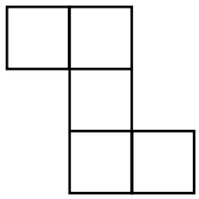
1. **Note:** All Questions below

Draw in a graph paper and colour differently, use squares.

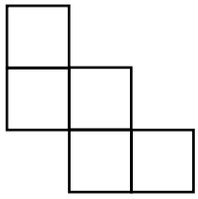




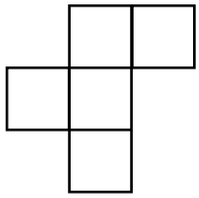
X



Z



W



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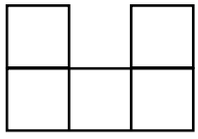
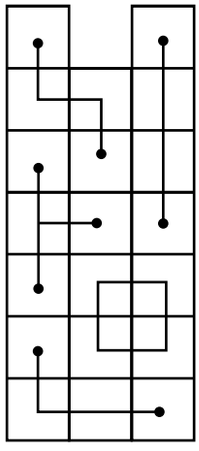
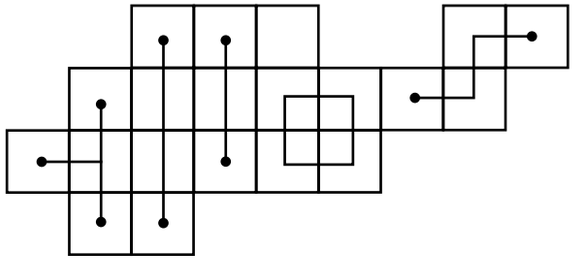


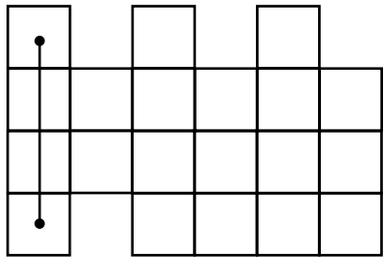
U

2.



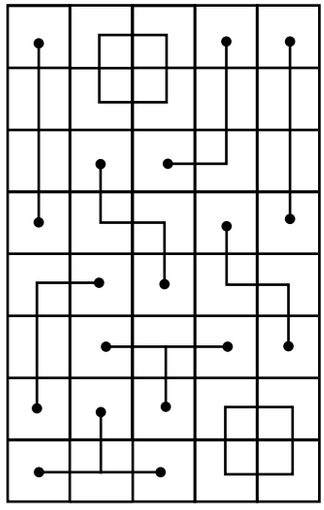


TILON



c. Not possible to cut without repetetion

3.



4. Answer may vary. Left to the students [Hint: It is not possible only using tetrominoes. You may have to use monominoes, dominoes, trominoes]

5. (1) and (2) are of same shape.

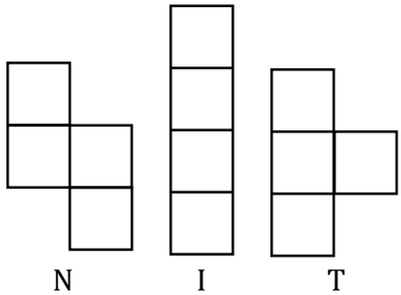
   Move (1) 5 squares to right, we get (2)

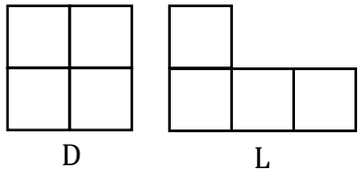
   ⇒ (2) and (3) are of same shape.

   ⇒ Move (2) 5 squares to right and 2 squares upward we get (3).

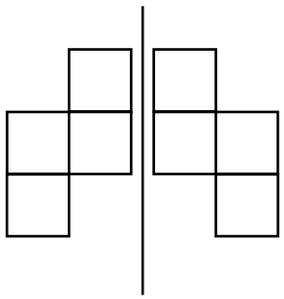
   ∴ (1), (2), (3) are of the same shape.

6.

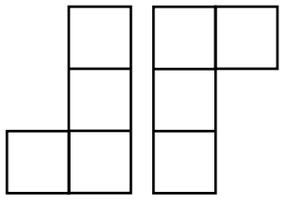




a)

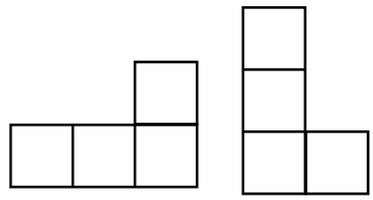


Reflection



Translation → 3 units right

Rotation → 180



Rotation → 90

Translation → 3 units right

Exercise: 6.2

Note: Questions 1,2,3 answers may vary, left to students

4. House → Garden, 15 km is the shortest way.

House → Airport → Playground → Garden
[distance = 25 + 17 + 6 + 5 + 30 = 83 km]

House → supermarket → Airport → Playground → Garden

[distance = 7 + 30 + 17 + 6 + 5 + 30 = 95 km]

Class: 7 KEY ANSWERS TERM : I

Chapter 1 MEASUREMENT

I.
1. Mass
2. Speed
3. kgm^{-3}
4. Sinks in kerosene
5. 1:2

II.
1. Length and time
2. Area
3. 154 mm^2
4. Graphical method
5. 4500 cc
6. 8m
7. 100 cm^3
8. 9.46×10^{15} m
9. An astronomical unit
10. Greater

III.
1. False
2. False
3. False
4. False
5. False

IV.

1.	Lightyear	-	Distance
2.	kg/m^3	-	Density
3.	cm^2	-	Area
4.	g	-	Mass
5.	Litre	-	Volume

V.
1) a
2) b
3) c

VI.
1. Physical quantities that cannot be expressed in terms of any other quantities are called *fundamental quantities*. Eg. Length, time.
2. Physical quantities that can be expressed by multiplication or division of fundamental quantities are called *derived quantities*. Eg. Area, Volume
3. *Area* gives the amount or extent of a surface. The SI unit used to describe area is square meter (m^2).
4. Pluck a leaf with a flat surface from any plant in your school. Spread a graph sheet containing square millimeters and square centimeters on a flat surface of the table. Place the leaf on the sheet without any folds, trace its outline with a pencil and remove the leaf. Count the number of complete centimeter squares within the outline = ___ × 100 mm^2. Count the number of complete millimeter squares within the outline = _____ mm^2. Count the number of millimeter squares that are more than half inside the outline = _____ mm^2 Neglect the millimeter squares that are less than half inside the outline. The Total surface area of the leaf (adding all the above) = _____ mm^2.
5. *Volume* is the actual space occupied by a body. It is the amount of three-dimensional space an object occupies. The SI unit to describe volume is cubic meter (m^3).
6. Fill an overflowing jar with water up to brim; keep an empty measuring jar below the spout. Using a fine silk thread, immerse the stone in the water carefully. The water overflowing is collected in the measuring jar. The volume of water collected in the measuring jar gives the volume of the stone.
7. *Density* is defined as mass of the body contained in its unit volume. The SI unit used for density is kg/m^3.

8. When a body is heated, particles present in the body tend to move apart and it expands. There is no change in its mass, while there is an increase in its volume. Hence the density of the body decreases.

9. A solid body sinks in water (liquid) if the density of the solid is more than that of water. Stone have higher density than water, so they sink. On the other hand wood have lesser density than water, hence they float on the surface of water. We can conclude that a solid body floats in a liquid if its density is less than the density of the liquid, and it does not dissolve in the liquid.

10. An *astronomical* unit is the average distance between the earth and the sun. It is approximately 150 million kilometers. Astronomical unit is used to express distance within the solar system. One *light year* is the distance that light travels in one year. 1 light year = 9.46×10^{15}m.

VII. H.O.T.S

1. a) Density of A and B are same. Equating density we get ratio of mass as 8:1.
   b. Volume ratio is same as mass ratio for A and B. ie 8:1.
   c. Volume of A and C are same. Equating volume we get ratio of mass as 2:1

2. Fill an overflowing jar with kerosene up to brim; keep an empty measuring jar below the spout. Put sugar in kerosene. The kerosene overflowing is collected in the measuring jar. The volume of kerosene collected in the measuring jar gives the volume of the sugar. Using balance measure the mass of sugar. Density can be found from definition, Density = mass/volume.

3. Area of cardboard piece =
   Area of bigger square – area of smaller square
   = $(20 \times 20) - (6 \times 6) = 364$ cm^2.

VIII. Solve the Numerical.

1. 25 cm^2 = 0.0025 m^2 = 2500 mm^2
2. 16 cm^2
3. 750 cm^3
4. Volume of water that can be poured without spilling = volume of the cylindrical vessel = 2310 cm^3
5. Density of lead = 11.6 g/cm^3
6. Mass of water = 50.25 – 20.25 = 30g.

   Density of water = 1g/cc

   Volume of density bottle = mass/density = 30 cm^3

   Mass of liquid = 40.75 – 20.25 = 20.5 g

   Density of liquid = 20.5/30 = 0.683 g/cm^3

Chapter 2 MOTION

I.
1. m/s
2. Decrease
3. Variable speed
4. Zero
5. Graph b
6. Lowering the position of centre of mass
7. 1s to 2s

II.
1. False. Displacement is a vector quantity which has both magnitude and direction, but distance is a scalar quantity which has only magnitude.
2. False. A body with more speed travels more distance in more time.
3. False. All body has mass. It falls because of acceleration due to gravity.
4. True.
5. True.
6. False. Definition of displacement - It is the shortest distance travelled by the body between two points. Displacement can be equal to distance when travelling in same direction. But it can be never more than distance.

III. 1. Displacement
2. Acceleration
3. m/s^2
4. 36 km
5. Velocity
6. Acceleration
7. 9.8 m/s^2
8. Negative
9. Displacement
10. Centre of mass

IV. 1. Unstable
2. Stable
3. Neutral
4. Unstable
5. Unstable
6. Unstable

V. 1. Stable equilibrium
2. Unstable equilibrium
3. Neutral equilibrium
4. Uniform velocity
5. Uniform acceleration

VI. 1. a. Distance is the path travelled by a body between two points. The shortest distance travelled by a body between two points in a fixed direction is called displacement.

b. Speed is the rate of change of distance travelled by the body. Speed is a scalar quantity. Velocity is the rate of change of displacement. Velocity is defined in terms of displacement, it is also a vector quantity.

c. Acceleration is said to be uniform when the change in velocity is equal in equal intervals of time. If the change in velocity of a body is not equal in equal intervals of time, then the body is said to undergo non-uniform acceleration.

d. When the centre of mass of a body lies below the point of suspension or support, the body is said to be in stable equilibrium. When the centre of mass of a body lies above the point of suspension or support, the body is said to be in unstable equilibrium. When the centre of mass of a body lies at the point of suspension or support, the body is said to be in neutral equilibrium.

2. Average velocity is the total displacement by time taken.

$$\text{Average velocity} = \frac{\text{total displacement}}{\text{total time taken}}.$$

SI unit of Average velocity is m/s.

3. Acceleration is the rate of change of velocity. It is given by the formula,

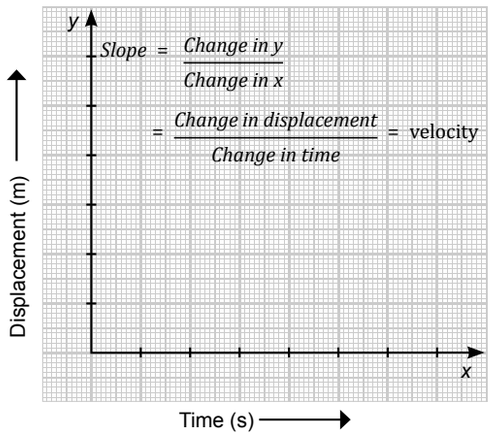
$$\text{Acceleration} = \frac{\text{change in velocity}}{\text{time interval}}$$

$$\text{Unit of acceleration} = \frac{\text{unit of velocity}}{\text{unit of time}}$$
$$= \text{m/s} \times 1/\text{s} = \text{m/s}^2.$$

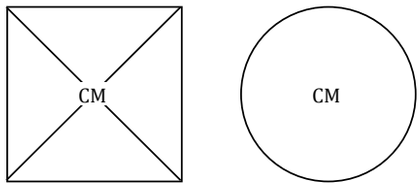
4. If the velocity of the body increases with time, it is said to accelerate (positive acceleration) If the velocity of the body decreases with time, it is said to decelerate or retard. Deceleration is negative acceleration.

5. All bodies on the surface and above the earth are pulled towards the centre of the Earth because of gravitational force of attraction. The acceleration produced due to this attraction is called acceleration due to gravity, denoted by '*g*'. The average value of '*g*' is taken as + 9.8 m/s^2 when a body falls to the ground, while it is taken as –9.8 m/s^2 when a body moves away from the earth. Thus a body is decelerated as it moves away from the earth and accelerated as it approaches the earth.

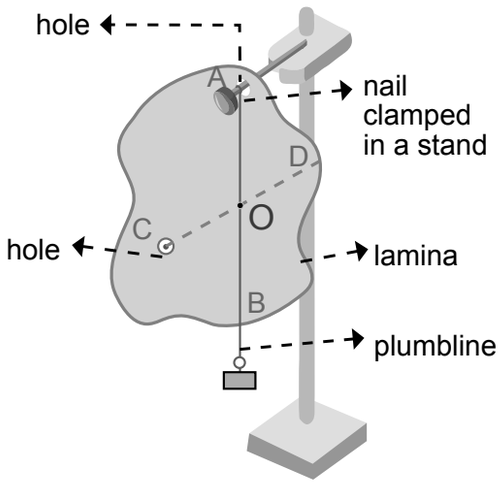
6. In a displacement-time graph, the time is taken on X-axis and the displacement of the body is taken on Y-axis. Velocity of the body can be found from this graph using the slope.



7. The centre of mass of regularly shaped objects lies at the geometric centre of the object.



8. Make holes at random positions on the lamina as shown in the figure. Hang the lamina on a nail fixed on a stand so that the lamina can swing freely. Hang the lamina through hole A. It will come to rest with centre of mass vertically below the point A. To find the vertical line from A, tie a plumb line (a thread and a weight) to the nail. Mark the position of the thread on the lamina (in the figure it is AB). The centre of mass of the lamina lies somewhere on this vertical line. Now hang the lamina by the hole C. Do the same process and the centre of mass lies somewhere on the vertical line CD. The point of intersection of AB and CD, O, is the centre of mass of the lamina.



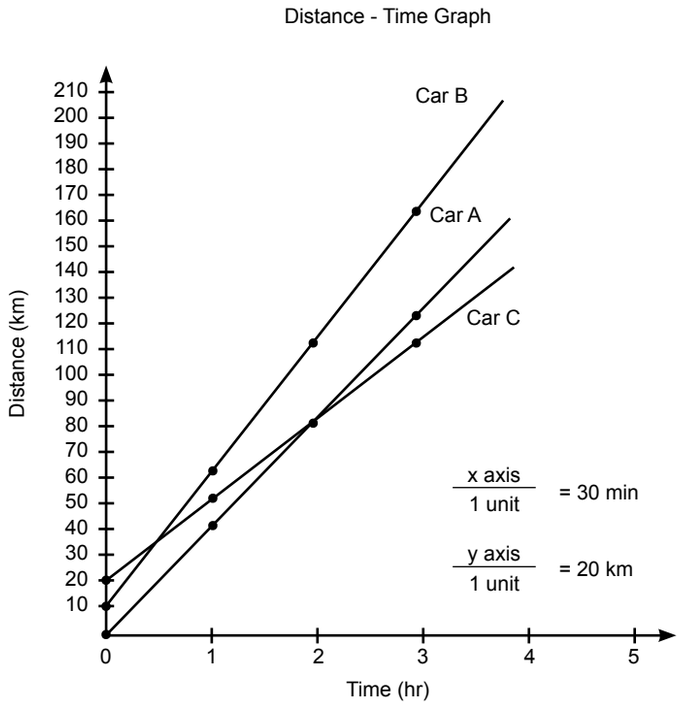
9. The position of the centre of mass of a body tells whether the body will topple over or not. This is important in the design of tall vehicles, racing cars, reading lamps etc.

10. The stability of a body is increased by
    a. lowering the position of its centre of mass
    b. increasing the area of its base

VII. Solve the numerical:

1. Distance (path ABC) = 4 + 3 = 7 km
   Distance (path AC) = Hypotenuse of the triangle = 5 km
   Displacement (path AC)=shortest distance = Hypotenuse of the triangle = 5 km

2. a.



//Use Graph Sheet//

b. All cars have initial velocity.
   Car A = 40 km/hr
   Car B = 50 km/hr
   Car C = 30 km/hr

c. Graph of car B is steepest. Car B has highest velocity is 50km/hr.

d. Car Average Speed

   A $\frac{160 - 0}{4}$ = 40 km/hr

   B $\frac{210 - 20}{4}$ = 50 km/hr

   C $\frac{410 - 20}{4}$ = 30 km/hr

3. Average speed = (4 + 2 + 1)/ (32 + 22 + 16) = 0.1 km/min

4. Acceleration (9.8 m/s^2) = (change in velocity)/(time taken, t) = (49 – 0)/t

   Time taken, t = 49 / 9.8 = 5s.

5. Average Acceleration (3.1 m/s^2) = (change in velocity) / (time taken, t) = (24.6-15.3)/t

   Time taken, t = 9.3 / 3.1= 3s.

6. Acceleration (9.8 m/s^2) = (change in velocity)/ (time taken, t) = (final veocity – 0)/4

   Final velocity = 4 × 9.8 = 39.2 m/s

VIII. H.O.T.S

1. Since direction is not changing and magnitude of speed is constant, acceleration will be zero.

2. Moving in a circular path with constant speed. Acceleration is due to the change in direction of velocity. Acceleration is a vector quantity.

3. Constant speed does not mean constant velocity. Velocity is vector quantity.

   Velocity can change due to change in magnitude or direction or both. Car can move with constant speed in curvy road. Acceleration is created at this situation. A person inside the car experiences this acceleration as force. This we will learn in higher classes as Newton's Law of Motion.

Chapter 3 MATTER AROUND US

I. 1. Elements and compounds

2. Mixtures

3. Metals, nonmetals and metalloids

4. Elements, mass

5. Nitrogen and oxygen

6. Atomicity

II. 1. Nitrogen, Oxygen

2. Sulphur, Carbon

3. Elements and compounds

4. Water, Ammonia

III. 1. The smallest particle of an element is called its atom. Some elements exist in nature as a combination of two or more of its atoms. The general name given to such combined atoms of elements that occur in nature is molecule.

2. An element is the basic and simplest form of matter that cannot be broken down into a simpler chemical substance. A compound is defined as a pure substance containing two or more elements combined with each other in a fixed ratio by mass.

3. Pure substances mean that they contain only one type of particle; all others that have more than one type of particle are impure substances or mixtures.

4. Elements that show most or all of the following properties are called metals.

   - They are shiny (lusture).
   - They can conduct heat and electricity.
   - They can be beaten into sheets (malleable).
   - They can be drawn into thin wires (ductile).
   - They can make a ringing noise when hit (sonorous).

   Elements that show most or all of the following properties are called non-metals.

   - They do not shine.
   - They generally do not conduct heat or electricity.
   - They are not malleable, ductile or sonorous.
   - They are soft.
   - They exist in all three states of matter.

IV. 1. Mercury – Liquid metal (all other are solid metals)

2. Bromine – Liquid (all others are solids)

3. Iron – Element (all others are compounds)

4. Milk – Impure substance (all others are pure sustances)

V. Ans: The assertion is false, but the reason is true.

VI.
1. Gaseous at room temperature
2. Carbon
3. Compounds combined to form molecules of compounds
4. Elements

VII.
1. Elements can be represented by symbols. Originally the symbols were all diagrammatic as proposed by Dalton. He also made it clear that the symbol will represent one particle of the element.
2. The number of atoms present in one molecule of the element is also called its atomicity.
3. Elements that have intermediate properties between that of metals and non-metals are called metalloids. Some common examples of metalloids are boron, silicon, arsenic, germanium and antimony.
4. Glucose – $C_6H_{12}O_6$; Ammonia – NH_3; Carbon monoxide – CO
5. Latin name of sodium is Natrium. We use 'Na' first two letters as symbol for sodium.
6. Molecule of an element contains more atoms of same kind. Molecules of compounds are formed by different atoms.
7. A change of state directly from solid to gas without changing into liquid state is called sublimation. Some solids like camphor and iodine do not become liquids but directly become vapors on heating.

VIII.
1. False
2. True
3. False
4. False
5. True

IX.
1. The particles in a solid are closely packed and cannot move. When we heat a solid in a container, the particles absorb the heat energy and start vibrating in their own positions. When more heat is supplied the particles gain more energy, break away from their positions and start moving; at this stage the solid slowly gets converted into a liquid and this process is called melting. Let us continue heating, the particles gain more and more energy and start moving faster and the liquid changes into a gaseous state. This process is called boiling. When we continue heating the gaseous particles move faster and further away from each other and eventually move out of the container.
2. Refer question III. 4 and let students try themselves.

X. H.O.T.S

1. On heating the particles in all the three physical states (solid, liquid and gas) gain kinetic energy and expand as they move apart and occupy more spaces. This phenomenon is called 'thermal expansion'. Gases show more expansion than liquids and solids.

2. a.  b.  c. 

Chapter 4 ATOMIC STRUCTURE

I.
1. Rutherford 1803 - Planetary model of an atom
2. Thomson 1911 - Water-melon model of atom
3. Dalton 1897 - Atoms cannot be created or destroyed

II.
1. Protons and neutrons
2. Protons, electrons
3. Neutrons
4. Valency
5. 3
6. 0.0000000001 m

III. 1. Both assertion and reason are true. And it is the correct explanation.

2. Both assertion and reason are true. And it is the wrong explanation.

   Correct reason: Mass of the electrons is negligible compared to mass of nucleus

3. Assertion is wrong. Reason statement is correct.

   Assertion: The number of protons is atomic number.

   Reason: The mass number is sum of protons and neutrons.

   This is the way how how atomic number and mass number is defined.

IV. 1. Electrons

2. Number of protons or number of electrons

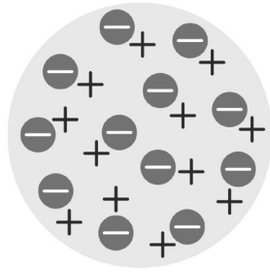
3. Carbon

V. 1. Postulates of Dalton's theory are
   - Matter is made up of tiny indivisible particles called atoms, which can neither be created nor destroyed.
   - Atoms of same elements were similar while those of different elements were different in size and mass.
   - Atoms of different elements combined to form compounds.

2. Nucleus contains protons and neutrons. Their masses are almost same. Their masses are 2000 times greater than mass of electron. So nucleus is heavier than rest of the atom.

3. Thomson's model proposed the following about the atom:
   - Atoms are spherical in shape with positive charge spread throughout them.
   - The electrons carrying negative charges were embedded in the sphere randomly, like seeds in a watermelon.
   - The positive and negative charges cancelled each other, making the atom neutral in nature.

   The model looks similar to a watermelon. So it is also called 'watermelon model'.



4. The total number of electrons in an atom is called its atomic number and is represented by Z.

   Z = atomic number = no: of e in an atom = no: of p in an atom.

   The total number of particles present in the nucleus of the atom is called its mass number and is represented by A. It is also called the atomic mass of the atom.

   A = total number of particles in atom nucleus = No. of *p* + No. of *n*.

5. In SO_2, 1 S combines with 2 O; valency of S will be 2 × 2 = 4.

6. Na has a valency of 1 and O has a valency of 2. 2 Na will combine with 1 O forming Na_2O.

VI. 1. Elements with same atomic number but different mass numbers are called isotopes. Isotopes will have same number of electrons and protons but different number of neutrons.

   Eg: C_6^{12} and C_6^{14} are isotopes.

   Elements with the same mass number but different atomic number are called isobars.

   Eg: Ca_{20}^{40} and Ar_{18}^{40} are isobars.

2. All elements have atoms with neutrons except for one. A normal hydrogen (H) atom does not have any neutrons in its tiny nucleus. That tiny little atom (the tiniest of all) has only one electron and one proton. You can take away the electron and make an ion, but you can't take away any neutrons. But in a natural state, atoms are neutral. So it should have equal number of electrons as much number of protons it has.

3. Protons, neutrons, and electrons are the three main subatomic particles found in an atom.

Protons have positive charge, electrons have negative charge and neutrons do not posses any charge.

Electrons are the least massive of an atom's subatomic particles, with a mass of 9.11×10^{-31} kg. Protons have a mass (1,836 times that of the electron) 1.6726×10^{-27} kg, while neutrons are the most massive of the three, at 1.6929×10^{-27} kg (1,839 times the mass of the electron).

4. a. KCl b. $FeCl_3$ c. Fe_2O_3
   d. Ca_2O_2 e. K_2O

VII. 1 Most of the mass of an atom is possessed by nucleus. So an atom without electrons will have mass (mass cannot be neither created nor destroyed). A normal hydrogen (H) atom has only one electron and one proton. You can take away the electron and make an ion. (ion – unbalanced charged atom).

2. Common salt is sodium chloride, the ionic compound with the formula NaCl, representing equal proportions of elements, sodium (Na) and chlorine (Cl). Ions in common salt are positive sodium ion and negative chlorine ion.

Element	Atomic number	Mass number
Sodium, Na	11	23
Chlorine, Cl	17	37

Chapter 5 THE LIVING WORLD OF PLANTS

I. Choose the correct answer from the following:

1. wind
2. fragmentation
3. mesophyte
4. fresh
5. male

II. Match the following:

Mint	Herb
Xerophytes	Deserts
Seas	Marine habitat
Unisexual flowers	Papaya
Banyan	Taproots
Corolla	Petals

III. State True or False

1. false 2. true 3. false 4. false

IV. Answer the following questions in one or two lines.

1. Depending on their water requirements, plants are classified as hydrophytes, mesophytes and xerophytes.
2. Reproduction is the process by which plants produce new individuals or offspring like themselves. Plants reproduce sexually or asexually.
3. A stamen has two parts – a thin long stalk called the filament and a knob like structure on top called the anther. The anther contains pollen grains, which contain the male gametes.
4. Bees and insects are attracted to both the brightly coloured petals and the sweet fragrance of flowers. While they collect the nectar from flowers, they also help in pollination by transferring pollen grains from the anther to the stigma of flowers.

V. Answer the following questions.

1. New plants are produced from other vegetative parts of the plant like the roots, stem and leaves. A part of the plant body gets detached and develops in to a new independent plant. You may have observed 'eyes' or buds on the skin of the potato. These can form new plants. In plants, like Bryophyllum, small plantlets develop along the leaf margins. These break off and grow into new plants. Plant parts as you will learn later in the lesson are also modified for vegetative propagation.
2. In the taproot system mainly seen in dicots the thick primary root is the dominant root that performs all the important functions. It gives rise to smaller secondary and tertiary roots that spread out in the soil. In the fibrous root system as seen in grasses and other monocots the radicle of the embryo stops growing after a while, and a bunch of roots begin to grow from the base of the

stem. These thread like roots increase the surface area and help in absorption of water and nutrients from the soil.

3. Pollination is the transfer of pollen grains from the anther to the stigma of a flower. Self pollination occurs when the pollen from one flower pollinates the same flower or other flowers on the same plant. Cross pollination takes place when pollen grains from one flower are transferred to a flower from a different plant.
4. Based on their shape there are three main types of roots. In fusiform the modified taproot is thickened in the middle and tapers towards both the ends like a spindle. E.g. Radish. When the modified root is broad at the apex and gradually tapers towards the base like a cone, it is called a conical root or coniform. E.g. Carrot. In Napiform the modified root is swollen at the top and broad at the centre and abruptly tapers into a tail-like portion at the base, giving a top-like appearance E.g. Turnip.

Chapter 6 HEALTH AND HYGIENE

I. Fill in the blanks:

1. balanced diet
2. Flossing
3. Gingivitis
4. obesity

II. State True or False. If false, correct the statement:

1. False
2. False
3. True
4. False

III. Match the following:

Column A	Column B
Vitamin C deficiency	Bleeding gums
Haemoglobin	Red blood cells
Cod liver oil	Anemia
Mycobacterium tuberculosis	Tuberculosis
Communicable disease	Cholera

IV. Answer the following in 1 or 2 sentences:

1. 'Health' is a state of complete physical and mental well being. According to the World Health Organization (WHO), 'Health is a state of complete, physical, mental and social wellbeing and not merely the absence of diseases'.
2. Hygiene is following certain practices that help to ensure cleanliness and good health. Personal hygiene means taking care of our own body, while social hygiene is keeping our surroundings clean.
3. Cataract is a disorder of the eye related to age. The lens in the eye loses its transparency. This condition can be cured by surgery in which the lens of the eye is replaced.
4. A good posture is very important and we must sit up straight, stand straight and walk upright. Good posture gives a graceful appearance to your body and also improves the flexibility of your joints.

V. Answer the following questions.

1. Some ways of protecting our eyes are as follows:
   - Keeping our eyes clean, and washing them two to three times a day with clean, clear water.
   - Eating a balanced diet with plenty of fruits and vegetables
   - Certain diseases like diabetes and high blood pressure affect the eyes. Regular exercise helps control these diseases and lowers the risk of eye problems.
   - Protecting our eyes from direct sunlight by wearing sunglasses.

- Wearing protective eye wear while playing different sports and while working in factories.
- Avoid sharing towels with others, even at home among family members.

2. Hair must be washed frequently, to remove all the excess oil , dead cells and sweat that collects on it making it look greasy and dirty. Washing, shampooing, combing and brushing it regularly, keeps it clean and healthy. It also keeps away parasites like lice that can irritate the scalp and make it itch. Massaging the scalp also helps improve circulation of blood in the scalp and promotes healthy hair growth.

3.

Communicable diseases	Non- communicable diseases
Communicable diseases can be spread from one person to another	Non- communicable diseases do not spread from one person to another
These diseases are spread by germs / microbes	These diseases are not spread by germs / microbes
Antibiotics and other medicines can be used as a cure	Antibiotics cannot be used as a cure

4. Anemia is a condition when the blood does not contain sufficient healthy red blood cells or haemoglobin. Foods rich in iron that are recommended for people suffering from anemia are green leafy vegetables like spinach, Moringa leaves, peas, beans and lentils and sheep or chicken liver. Supplements like Cod liver oil tablet can also be taken.
5. Burns are classified as follows:
   - First degree burns affect only the top layer of the skin and cause reddening.
   - Second-degree burns affect the deeper layers of the skin and can cause blisters.
   - In third-degree burns the tissues of the deepest layer are damaged completely.

Class: 7 KEY ANSWERS TERM : I

HISTORY

Chapter - 1 SOURCES OF MEDIEVAL INDIA

I. Choose the correct answer:

1. i. Firdausi
2. ii. 647 C.E
3. ii. South India
4. i. Al-biruni
5. ii. Thiruvasagam

II. Pick out the odd one and State the reason:

1.	Amirkhusrau	-	poet	
2.	Artifacts	-evidence of archeology		
3.	Ain-i-Akbari	Biography of Babur	- incorrect pair. Ain-i-Akbari	Biography of Akbar.
4.	copper plate inscription	-	Inscription	

III. Answer the following:

1. If I am a historian, then I will use the following sources to gather the information:
   - Literary
   - Numismatics
   - Inscriptions
   - Archeological Evidence
   - Foreigner's Account
2. The following are the religious literature of the Medeival Period:
   - Kamba Ramayanam by the poet Kambar
   - Sekkizhar's Periyapuranam
   - Nalayara Divya Prabandham composed by Twelve Alwars
   - Moovar Thevaram composed by Appar, Sundarar, Gnanasambandhar
   - Manicavasagar's Thiruvasagam
   - 15th century mystic poet Kabir's Dohe
3. Brahadeshwara Temple, Gangai Konda Cholapuram Temple, Khajuraho monuments in Madhya Pradesh by the Rajputs of Rajasthan and The Sun Temple at Konark (Odisha) built by King Narasingha of Ganga Dynasty, Vitala and Virupaksha temples at Hampi by Vijayanagara rulers.
4. Numismatics means study of coins or medals. Coins are important source of historical information. Even the quality and the material with which the coins are made help archaeologists and historians understand how trade and commerce functioned during the time. It also reflects the advancement in metallurgy during those times.
5. Whenever I see a historical monument, I feel like gathering the following information:
   - Period in which it built.
   - Person who built it.
   - Materials used and style of architecture followed.

   I will feel like maintaining and protecting the monument.
6. He could gather the following information about the Medieval Period:
   - Art and architecture
   - Life style of the people
   - Foreigners who visited the country.
7. The Sun Temple at Konark (Odisha), Vitala and Virupaksha temples at Hampi. A few examples of Islamic architecture such as Balban's Red Palace, the Jamait Khan Masjid, the tomb of Tughluq Shah, the city of Tughluqabad and Kuffa Firoz Shah built by the Tughluqs; Qutub-ud-din Aibak constructed the famous Quwat-ul-Islam

mosque at Delhi, the Dhai-Din ka Jhoupra at Ajmer, and the Qutub Minar in Delhi.

8. a. Rock inscription

   b. As a source

   c. Rock edicts of Khalsi, Ashokan Edicts in Delhi

IV. Answer in detail:

Many foreigners who travelled to India during the period have contributed their accounts of their journey through India in their works. Of the many foreigner accounts available, the following are considered the most important:

1. **Al-biruni** - Iranian scholar and polymath who accompanied Mohammad Ghazni to India and authored Tahqiq ma li-l-hind. For his work, Al-biruni is considered the father of Indology (study of the Indian subcontinent).
2. Italian traveler **Nicolo Conti's** accounts provide the details of the life and customs of the people of India.
3. **Ibn-Battuta**, an explorer from Morocco visited India during the rule of Mohammed-bin-Tughluq, who was considered to be the richest man alive during the time
4. **Domingos Paes**, a Portuguese traveler has written a detailed description of life during the Vijayanagara Empire in south India.
5. Italian traveler **Marco Polo's** account of his journey through India is a rich source of information about the Sultanate period.
6. **Abdur Razzaq**, a Persian traveler came to South India. He stayed in Vijayanagar from 1442 to 1443. He wrote about his experience.

Chapter - 2 RISE OF NEW KINGDOMS – NORTH INDIA

I. Fill in the blanks:

1. Son of a king
2. Sun
3. Sisodias
4. Vesara
5. Suryavanshi clan

II. Write a sentence about the following in your own words:

1. **Prithviraj Chauhan:** Prithviraj Chauhan is considered to be the greatest king of the Chauhan dynasty. A historian **Chand Bardai** has written about the wars and deeds of Prithviraj in his famous book **Prithviraj Raso**.
2. **Mihir Bhoja:** The greatest Pratihara ruler was Mihir Bhoja. He took the title of Adivaraha.
3. **Khajuraho monument:** Khajuraho monuments are group of temples built in the Nagara style during the Rajput period.
4. **Kumbalgarh fort:** The Kumbhalgarh fort in Mewar was built by Rana Kumbha and is known to be the highest fort in Rajasthan.

III. Answer in brief:

1. Rajputs are descended from the thirty-six royal Kshatriya clans. Few are Gujara-Prathihara, Chauhan, Sisodias.
2. AS THEY WISH
3. Suryavanshi – Clans belonging to the Sun Dynasty

   Chandravanshi – Clans belonging to the Moon Dynasty

   Agnivanshi – Clans belonging to the Fire Dynasty (Agnikula)
4. The Gurjara-Pratihara also known as Prathihara Empire ruled much of Northern India from mid of 8 to 11th century. Dynasty claims its lineage from the **bloodline of Lakshmana**. **Harichandra (King of Jodhpur)** laid the foundation of the Gujara dynasty. Gujara-Prathihara are known for their sculptures, carved panels and temples. The greatest style of their temple building was at Khajuraho, now a UNESCO World heritage site.

IV. Answer in Detail:

1. The **Chauhans** were powerful kings. The Chauhans ruled between 956 C.E and 1192 C.E.

Prithviraj is considered to be the greatest king of the Chauhans on whom the most records exist from multiple sources, including folk tales and historical records. A historian **Chand Bardai** has written about the wars and deeds of Prithviraj in his famous book **Prithviraj Raso**.

Prithviraj Chauhan also managed to repel the attacks by Mohammed Ghori in the **First Battle of Tarain** (1192 A.D.) He was defeated and killed a year by Mohommed Ghori later in the **Second Battle of Tarain**.

The kingdom broke into the Satyapura and Devda branches after the invasion of Qutubuddin Aibak (first sultan of Delhi Sultanate) in 1197.

Chapter – 3 INVASIONS FROM THE NORTH AND RISE OF ISLAMIC RULE

I. Choose the correct answer:

1. Muhammad Ghori
2. Kayadra
3. Somanath
4. Srihind

II. Answer in brief:

1. He is known as an ambitious ruler because he wanted to have crossed the Indus River and plundered parts of modern-day Afghanistan, Pakistan and India nearly seventeen times.
2.

	First battle of tarain	Second battle of tarain
Year	1191	1192
Who defeated whom?	Prithviraj chauhan defeated muhammad ghori	Muhammad ghori defeated prithviraj chauhan.
Result	Ghori withdrew.	First muslim kingdom was established.

3.

Muhammad Ghazni	Muhammad Ghori
1. He was the first independent ruler of Ghaznavid dynasty.	1. He established Muslim kingdom in India.
2. He came to India through Punjab.	2. He came to India through Gujarat.
3. He lost the battle seventeen times.	3. He made several conquest in India.

4. The Khokhar are people from Rajput community in Punjab. In 1205, Muhammad Ghori undertook many campaigns against the Khokhar in Punjab. Khokhar killed Ghori in 1205, at Lahore.

III. Answer in detail.

Conquests of Gujarat, Bundelkhand, Bengal and Bihar (1195-1202 A.D.) by Qutubuddin Aibak:

Qutubuddin Aibak attacked **Bhimdev**, the king of Gujarat. Though he was defeated, in the next battle he defeated Bhimdev and conquered Gujarat. His next target was Bundelkhand, ruled by the Chandel Rajputs. He defeated them too and conquered **Bundelkhand**. During this time, Muhammad Khilji, a slave of Mohammed Ghori attacked Bihar in 1197 and Bengal in 1202. Both Bengal and Bihar came under the control of Ghori, and **Khilji** became the viceroy of Bengal and Bihar.

Chapter – 4 EMERGENCE OF NEW KINGDOMS – SOUTH INDIA

I. Choose the correct answer

1. Malay Archipelago and China
2. Rajendra Chola and Rajendra Chalukya
3. Nataraja
4. Temples and Mutts
5. Sundara Pandyan
6. Vikrama Pandya

II. Answer in brief:

1. Kallanai dam is the fourth oldest water-divertion/ water-regulator structures in the world and the oldest in India which is still

in use. This dam became a model to later engineers.

2. The primary source of information on the rule of the Pandyas is from accounts by foreign travellers and traders. The land of the Pandyas was described as Pandyas by Megasthenes, as Pandi Mandala in the Periplus of the Erythraean Sea and as Pandyan Mediterranea and Modura Regia Pandionis by Ptolemy. The accounts of Marco Polo also mention later Pandya rulers

3. Tamilakam or Ancient Tamil country refers to the geographical region inhabited by the ancient Tamil people. Tamilakam covered today's Tamil Nadu, Kerala, Puducherry, Lakshadweep and southern parts of Andhra Pradesh and Karnataka.

4.

Current Social life	Pandyas social life
1. The society was divided into caste categories like SC,BC, etc.	1. The society under the Pandyas was based on the traditional fourfold division namely the Brahmins, Kshatryas, Vaisyas and Sudra.
2. The caste system is not rigid.	2. The caste system was not rigid.
3. Women are generally treated on a par with men in possessing property and providing education.	3. Women were generally treated on a par with men.

5. Pearl fishing was flourished during the Sangam age. The Pandyan port city of Korkai was the center of pearl trade. Written records from Greek and Egyptian voyagers give details about the pearl fisheries off the Pandyan coast.

6. During the Second Pandyan empire, internal trade was active. Many trade guilds emerged in the Pandya region.

- The wide use of coins, weights and measurements by the merchants showed flourishing trade.
- To promote trade sometimes the kings were liberal and exempted some traders from paying taxes.
- The Tamilians were great traders. This is because of the increase in the agricultural production and availability of natural resources and minerals in the Pandya region.

III. Answer in detail:

1. Cholas has great patron towards Tamil literature and in building temples. Their rule has resulted in some great works of Tamil literature and architecture.

   The world famous UNESCO Site, Brahadeshwara Temple at Tanjur is a well-known Chola architecture built by Rajaraja Chola I.

   Airavateswara temple: Situated in Darasuram near Thanjavur, the Airavateswara temple was built during the reign of **Rajaraja Chola II**.

   Kampaheswarar temple: Another example of the fine architecture from this period is the **Kampaheswarar temple** at **Tribhuvanam**, near Kumbakonam **Sculptures and Bronzes**.

   The Chola period is also remarkable for its sculptures and bronzes. Most sculptures depict the god Shiva in various forms accompanied by his consort Parvati and the other gods, demigods and goddesses belonging to the Shaivaite belief, and other Shaiva saints.

2. **The Pandyan Dynasty:** extended from parts of modern-day Madurai, Thirunelveli, Trichy, and parts of Travancore. They initially ruled their country Pandya Nadu from Korkai, a seaport on the southernmost tip of the Indian Peninsula, and in later times moved to Madurai.

   The First Pandya Empire: The dynasty revived under Kadungon in the early 6th century. After the defeat of the Kalabhras, the Pandya kingdom grew steadily in power and territory.

   The Second Pandya Empire: From 13th century onwards, the Pandyas wanted to restore their kingdom. So again they fought with the Cholas and Pallavas and established their kingdom in Madurai.

Vikrama Pandya captured Madurai with the support of Kulotthunga III.

He was succeeded by his son **Jatavarman Kulasekara I**.

The Later Pandyas (1216–1345) entered their golden age under **Maravarman Sundara Pandyan and Jatavarman Sundara Pandyan (C.E. 1251)**, who expanded the empire into Telugu country, conquered Kalinga and Sri Lanka.

Decline of the Pandyan Empire: During their history, the Pandyas were repeatedly in conflict with the Pallavas, Cholas, Hoysalas and finally the Muslim invaders from the Delhi Sultanate.

Chapter – 5 DELHI SULTANATE

I. Choose the correct answer:

1. Qutb ud-din Aibak
2. Qutubuddin Aibak
3. Iltumish
4. NAvroz
5. Ibrahim Lodi

II. Prepare a timeline of the Dynasties of Delhi Sultanate:

The Mamluk dynasty/ Slave dynasty (1206–90)

The Khilji dynasty (1290–1320)

The Tughluq dynasty (1320–1414)

The Sayyid dynasty (1414–51)

The Lodi dynasty (1451–1526)

III. Give the relationship of:

1. Father
2. Youngest son
3. Son
4. Father
5. Father

IV. Answer in brief:

1. Mohammed Ghori, after winning the second battle of Tarain against Prithviraj Chauhan, immediately started his plunder in India. Soon after, he returned to his kingdom and left his trusted lieutenant and former slave Qutubuddin Aibak to rule on his behalf. This marked the beginning of centuries of Islamic rule that was to follow in Inida.
2. Few examples of Muhammad bin Tughluq hasty decisions:

   When he ordered minting of coins from base metals with face value of silver coins. This created a lot of confusion and failed miserably because ordinary people minted counterfeit coins from base metal they had in their houses and used them to pay taxes and

Another example was:

Shifting of Capital Tughluqabad to Daulatabad:

Mohammed bin Tughluq ordered the transfer of his capital from Delhi to Devagiri (i.e. Daulatabad) by forcing the mass migration of Delhi's population. Those who refused to do so were brutally killed and few died in the journey. The move to the new failed because Daulatabad did not have enough drinking water. After two years, the Sultan realized his mistake and the capital was shifted back to Delhi.

3. Firoz Shah Tughluq built towns such as Firozpur, Firozabad and Hissar.
4. Balban is referred to as the strongest ruler of the Slave Dynasty after Iltumish until Alauddin Khilji. He consolidated the power of the Slave Dynasty while also repelling constant attack by the Mongols. In spite of having only a few military achievements, Ghiyasuddin made civil and military reforms that earned him the position of being a strong ruler.
5. The greatest setback to the Tughluq dynasty came from the invasion of Timur, a Turkish chieftain from Central Asia, who attacked Northern India in the year 1398 C.E. He plundered the country. There was no opposition to his army when he ransacked the city of Delhi and they returned to Samarkhand with the wealth. The dynasty came to an end with the death of Mohammed Tughluq III in 1413 C.E.

6. Sikandar Lodhi encouraged trade and commerce and suppressed the powerful Afghan nobles. He organized an efficient spy system. He improved agriculture and industry. During his period, several Sanskrit books dealing with mathematics, medicine, astronomy and yoga were translated into Persian.
7. Ghiyasuddin Tughluq Shah, Abu Bakr Shah and Nasiruddin Mohammed Tughluq were the successors of Firoz.

V. Answer in detail:

1. Right after the fall of the Tughluq Dynasty, the Sayyid Dynasty arose. When Timur left India after his plunder, he appointed Khizr Khan as the Governor of Multan in 1413 C.E. Slowly, Khizr Khan used his power and influence to slowly bring other territories under his control. He was succeeded by his son Mubarak Shah (1421-1434 C.E.) Only in his reign, Hindu nobles were appointed in the court of Delhi. He was murdered in 1434 C.E., after which he was succeeded by his nephew Mohammed Shah who entered into a military alliance with Bahlol Lodi, the Governor of Lahore. Bahlol Lodi taken the throne from Mohammad Shah's son Alam Shah by occupying Delhi in 1457 C.E. The Sayyid Dynasty ended with the death of Alam Shah in 1467 C.E.
2. In Mamluk dynasty, the Women ruler Raziya Sultana took the power.
   - Raziya was the first woman ruler of Delhi.
   - She defeated and killed Firoz Shah, who ascended the throne after the death of Iltutmish. She was highly talented and won the praise of her father.
   - Raziya was favoured Jamaluddin Yaqut. The Turkish nobility became jealous because she was favouring Yaqut, who was not a Turk. Soon a rebellion broke out in which Yaqut was killed and Raziya was taken as prisoner.
   - Later, Raziya married Malik Altunia one of her nobles. Razyia's brother, Muzuddin Bahram Shah, killed Raziya and her new husband in 1240 C.E.

GEOGRAPHY

Lesson – 1 INTERIOR OF THE EARTH, VOLCANOES AND EARTHQUAKE

I. Choose the correct answer:

1. a. Lithosphere
2. c. plate boundaries
3. c. Silica and aluminium
4. d. Deccan Plateau
5. d. Ritcher scale
6. d. Pacific

II. Fill in the blanks

1. crater
2. Barren Island in the Nicobar Islands
3. The Mariana's trench
4. Magma
5. Tectonic movements

III. Find the odd one out

1. Vent
2. Magma
3. Lakshadweep Island

IV. Match the following:

1. The Earth	-	Rocky planet
2. Mid Atlantic Range	-	longest range under sea
3. Riff valley	-	Africa
4. The core	-	Barysphere
5. Tectonic movements	-	Convection current

V. Choose the appropriate answer:

1. b. A and R are correct and A explains R.
2. b. A and R are correct and A does not explains R

VI. Give single words for the following:

1. Crust
2. Mt.Popa Africa
3. Tsunami
4. Epicentre
5. Himalayan mountain in India

VII. Answer briefly:

1. An earthquake refers to trembling of the earth's surface due to a sudden release of energy from within the earth's interior. The sudden release of energy creates a vibration on the earth surface. It may last only for a few seconds.
2. A volcano is a vent in the earth's crust through which molten magma erupts suddenly toward the earth's surface. Lava is the name given to the molten rock material magma spewed on the earth's surface.
3. Volcanoes can also be grouped according to their periodicity of eruptions as active, dormant and extinct.
4. The boundary between the mantle and core is called as Weichert-Gutenberg discontinuity.
5. Earthquakes cause buildings collapse, vibrations often set landslides in mountaineous region.

VIII. Give Reason:

1. The outer core of the earth is made up of Nickel (Ni) and Iron (Fe). Hence the core is also called as Nife layer. This layer extends from 2,900 to 5150 km.

2 The heat in the interior of the earth keeps the surface in motion. The movement of the Earth's lithospheric plates is termed as tectonic movements. Tectonic movements are likely caused by convection currents in the molten rock in Earth's mantle below the crust.

IX. Distinguish between:

1.

Sial	SIMA
The continental crust is made up of minerals silica and aluminium. So it is referred as Sial.	The oceanic crust is composed of dense rocks such as basalt mainly of silica and magnesium. It is therefore called Sima.

2.

Active Volcano	Dormant Volcano
Active: volcanoes are volcanoes that erupt frequently, if the eruption occurred currently or have erupted in recent times. These are 600 active volcanoes in the world. Eg. Mt. Stromboli – Mediterrean Sea	Some volcanoes may erupt in the future. At present they are quiet or 'sleeping'. They are called dormant volcanoes. Eg. Mount Fuji in Japan

3.

Exogenic Forces	Endogenic Forces
The forces that work on the surface of the earth are called as exogenic forces.	The forces which act from the interior of the earth is called as endogenic forces.

X. Answer in detail:

1. Classification of Volcanoes:

   Volcanoes can also be grouped according to their periodicity of eruptions as active, dormant and extinct.

   Active volcanoes are volcanoes that erupt frequently, if the eruption occurred currently or have erupted in recent times. These are about 600 active volcanoes in the world.

   Eg. Mount Stromboli - Mediterranean Sea, Mount Etna in Italy are examples of active volcanoes. Hawaiian Islands. India's only active volcano is in Barren Island in the Nicobar Islands. Mauna loa in Hawaii is the world's biggest active volcano.

Dormant Volcanoes:

Some volcanoes may erupt in the future. At present they are quiet or 'sleeping'. They are called dormant volcanoes.

Eg. Mount Fuji in Japan, Mt Vesuvius (Italy), Mt. Krakatoa-Indonesia.

Extinct Volcanoes:

1. Some volcanoes erupted in the past but have not erupted within human history. They are called 'dead' or extinct volcanoes. They no longer have a supply of lava under them.

Eg. Mount Kilimanjaro in Tanzania, Mt. Kenya, Mt.Popa Africa.

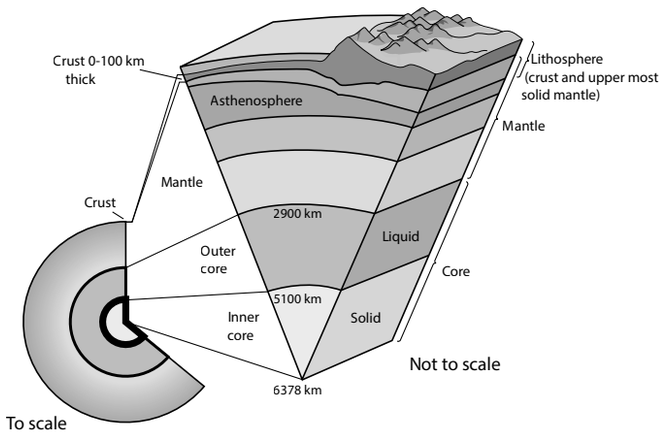
2. Volcanoes and Earthquakes are distributed along the plate boundaries. They are the most active zones of the world. The volcanic belts are also the principal earthquake belts of the world.

   There are three major zones of volcanic activities in the world.

   They are the circum pacific belt, the mid continental belt and the Atlantic belt. The circum pacific belt occurs as a ring around the Pacific Ocean which is itself roughly circular in shape. Therefore, it is called the" Pacific Ring of Fire" or simply "Ring of Fire.

   Volcanoes and earthquakes are ways by which the earth adjusts itself to changes. Volcanoes bring out the magma as lava. In some plate boundaries, the rocks are slipping into the earth where one plate goes under another when they meet. Thus the earth cycle goes on.

3. The earth is divided into different layers. They are the **crust, mantle and core**.



   The Crust is like the skin of the apple or even our own skin. It is very thin and made up of hardened rocks. It is the outermost layer of the earth. The surface is not uniform. The Crust along with the layer just beneath it is called the **lithosphere**.

   Earth's crust is divided into two - continental crust and oceanic crust.

   The continental crust is made up of minerals silica and aluminium. So it is referred as **Sial**. The oceanic crust is composed of dense rocks such as basalt mainly of silica and magnesium. It is therefore called Sima. The Sial and **Sima** together forms the Earth crust.

   The layer beneath the crust is the '**mantle**'. It is so hot in this layer that all minerals exist only in a semi liquid state called **magma**.

   The core is the innermost layer of the earth. It is also known as the **barysphere**.The core is divided into outer core and inner core. The outer core is made up of Nickel (Ni) and Iron (Fe). Hence the core is also called as Nife layer.

Chapter – 2 LANDFORMS - WORK OF RIVER, DESERTS, COASTS AND ICE IN COLD AREAS

I. Choose the correct answer:

1. Plunge pool
2. Inselbergs
3. Lagoon
4. 'U' shaped valley
5. Source

II. Fill in the blanks:

1. Distributaries
2. Barchans
3. Glacier
4. Cirques
5. Moraines

III. Match the following:

1. Water falls – Courtalam
2. Loess – Gobi desert
3. Tributary of River Ganga – Yamuna
4. River kosi – Sorrow of Bihar
5. Lagoon – Pulicat lake

IV. Answer in one word:

1. rapids
2. Mouth

V. Give single words for the following: (this belongs to previous lesson)

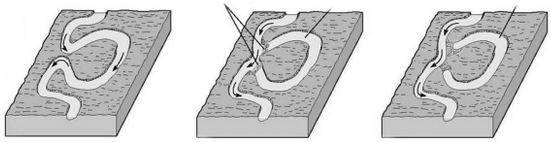
1. Crust
2. Mt.Popa Africa

VI. Choose the appropriate answer:

1. b.A is correct but R is wrong
2. a. Both A and R are correct

VII. Answer briefly:

1. **Weathering**:
   It involves the breakdown of rocks into smaller and smaller particles until they become fine soil.
2. **Ox-bow Lake**:
   Due to continuous erosion and deposition along the sides of the meander, the ends of the meander loop comes closer and closer. In due course of time, the meander loop cuts off from the river and forms a lake called as Ox-bow Lake. The name ox-bow is because the bend of the river resembles the hoof of an Ox.



3. **Meander**:
   It means Zig-zag path. When the alluvial silt blocks the path of the river, the river bends around it and takes curved path known as Meander.
4. Tributaries are found in the journey of the long rivers to the sea. The small rivers joins them in the mid-way known as tributaries. Eg. River Kaveri's tributaries are Bhavani and Hemavathi.
5. Waves, tides and Currents are three movements of Ocean water.
6. Features of
   Waves – Sea cliff, Sea arches
   Wind – Sand dunes, Barchans
   Glacial erosion – ribbon lakes, Moraines

VIII. Distinguish between:

1.

Continental Glacier	Valley Glacier
Glaciers in large plains.	Glaciers in mountains.
Eg. Glaciers in Russia and Cannada	Eg. Himalayas, Alps

2.

Delta	Estuary
The triangular feature of distributaries formed before joining the sea.	A River joining the sea as a single mouth without forming a delta.
It joins the sea as many mouths.	They are usually deep and form good harbours and are important for fishing.
They are very fertile.	
Eg. Ganga-Brahmaputra delta	

3.

V-shaped Valley	U-shaped Valley
The valley formed when a river erodes through the mountains cutting vertically like a knife cuts through a cake.	Glaciated valley which has flat bottom and steep sides.

4.

Weathering	Gradation
Weathering involves the breakdown of rocks into smaller and smaller particles until they become fine soil.	Gradation is the process of wearing of rocks, transporting them and depositing them elsewhere by moving agents.

IX. Give Reasons:

1. The river deposits the load that it carries silt and other materials as sediments, called alluvium. This alluvial soil becomes the plains fertile.
2. Glaciated Valleys have flat bottoms and steep sides when they erode. Thus it has U shape. Whereas River valleys erode through mountains cutting vertically forming V shape.

X. Answer in detail:

1. The rivers in its course do its gradational work under three types of work: erosion, transportation and deposition.

   The landforms formed by the rivers in its course are:

   Waterfall, Valley, Plains course

   Waterfall:
   Falling of river water over a vertical step in the river bed is called Waterfall. Smaller waterfall are called rapids.

   Valley:
   Rivers erode through the mountains cutting vertically like a knife cuts through a cake. The result is a V-Shaped valley and a steep gorge.

   Plains course:
   In the mature stage or in the plains course of a river, the wide plains and the slowing down of the river speed makes the river bend and curve. It lays down some of the load that it carries silt and other material as sediments, called alluvium. The alluvial silt is laid down blocking the path of the river. So the river bends around it and takes a curved path known as a meander.

2. **Landforms formed by wind deposition**:

   Sand dunes, Barchans, Loess

   Sand dune:
   A sand dune is a heap of sand that may be a mound of a metre or so to hills of sand that may be 200 metres high. The sand that gets carried finds the rock as obstruction, falls and then gets deposited in low hill like structures. These are called sand dunes.

   Barchans:
   The crescent shaped sand dunes are called Barchans.

   Loess:
   Very fine particles of sand can get blown long distances from their place of origin. When such sand is deposited in large areas, it is called loess. Large deposits of loess from Gobi deserts are found in China.

3. **Aretes**:
   When a glacier moves down snowy peaks of mountains, it forms sharp edges on mountain tops by plucking and freezing.

   Cirques

   An arm chair - shaped depression with a steep side wall and head wall.

   When many arêtes and cirques form successively around a mountain, they leave behind a sharp-edged peak that looks like a pyramid. Such peaks are called pyramidal peaks.

   Glaciated valleys unlike river valleys are U shaped. They have flat bottoms and steep sides. When the glacier melts, the eroded depressions are left with the melt water and form long lakes that show the path of the glacier. They are called ribbon lakes. The sharp deposits such as rocks, sand, silt that the glacier carries are called moraines. Agents of gradation sculpt and carve out land features and add beauty to them. Each feature has a form and a way of forming.

Chapter-3 POPULATION AND SETTLEMENT

I. Choose the correct answer

1. b. Rural
2. b. Star-like settlement

II. Fill in the blanks

1. Villages
2. Nucleated Settlement
3. Urban

III. Match the following:

1. Caucasoid – European
2. Negroid - African
3. Mongloloid - Asiatic
4. Australoid - Australian
5. Apartheid – South Africa

IV. Answer in one word

1. demography
2. anthropology
3. Migration
4. Scriptures

V. Answer the following:

1. Major Human Races of the world are. Caucasoid, Negroid, Mongloloid, Australoid.
2. Hinduism, Islam, Christianity, Buddhism, Jainism and Sikhism are the major religions of India. Other major religions of the world are Judaism, Shintoism, Confucianism, Taoism.
3. The city is an urban region which is very much advanced interms of infrastructure, real estate, communication and market facility are called Smart city. Eg.
4. Urban Settlements are classified into Large towns, Cities, Metropolises, Megapolises, Smart Cities, Satellite town
5. After Independence the different territories of India are reorganised as States and Union Territories based on languages to highlight the diversity and culture of different regions.

VI. Give reason:

1. In, Urban Settletments agriculture is almost absent. Hence most people are engaged in shops and other business. Services like transport, piped water supply and sewage disposal, schools, medical facilities are readily available.

   Due to all this, In the urban settlement people are mostly engaged in secondary and tertiary activities.

VII. Distinguish between:

1.

Rural Settlement	Urban Settlement
Villages are called Rural settlements.	Towns and cities are called Urban Settlements.
Agriculture is the main occupation.	Agriculture is almost absent.
People involve themselves in primary activities.	People involve themselves in secondary and teritiary activities.
Services and Facilities are poor.	Services and facilities are good.

2.

Negroid	Caucasoid
Negroid have dark eyes, black skin, black wooly hair, wide nose, long head and thick lips.	They are with fair skin, dark brown eyes, wavy hair and narrow nose.
They are living in Africa.	They are in Europe.

3.

Compact Settlement	Dispersed Settlement
Compact settlement is also known as nucleated settlement.	Dispersed settlements are found in areas of extreme climate, hilly areas, forests etc.,
In this type large number of houses are built very close to each other.	The houses here are far apart with space. Eg: In Thar Desert, Rajasthan
Such settlements are found along the river valleys and in plains.	

4.

Metropolis	Megapolis
Towns with over 1 million.	Very large metropolises.
Eg. Chennai, Bangalore	Eg. Boston, Newyork in USA

VIII. Answer in a paragraph:

1. The most widely found human racial types are based on visual traits such as head shape, facial features, nose shape, eye shape, skin colour etc.,

   The major Human Races of the World are:

   1. Causasoid (European)
   2. Negroid (African)
   3. Mongloloid (Asiatic)
   4. Australoid (Australian)

The Caucasoid is known as European race. They are with fair skin, dark brown eyes, wavy hair and narrow nose. They are found in Eurasia.

Negroid have dark eyes, black skin, black wooly hair, wide nose, long head and thick lips. They are living in Africa.

Mongoloids are known as the Asian-American race. They have light yellow to brown skin, straight hair, flat face, broad head and medium nose.

Australoids live in Australia and Asia. They have wide nose, curly hair, short in hair and dark skin.

2. **Urban Settlements**:
   Towns and Cities are Urban Settlements.

   These are the towns with over 10,000 population and cities with over 1,00,000 population. They have houses and buildings close to one another and are connected by a good network of roads.

   Services:
   Services like transport, piped water supply and sewage disposal, schools, medical facilities, recreation and entertainments are readily available. Most people are engaged in shops and other business establishments. Agriculture is almost absent. Hence, In the urban settlement people mostly are engaged in Secondary and Teritiary Activities.

   Types:
   Cities, Large towns, Metropolis, Megapolis, Smart city, Satellite town.

   A Conurbation is a region comprising of that through population growth and physical expansion have merged to form on continuous urban area.

3. The rural settlements are broadly classified into linear settlement, rectangular settlement, circular settlement, star like pattern etc.,

   - Some village may be along a river, road or railway line. They are called as linear settlements.
   - Rectangular settlements are almost straight, meeting each other at right angles. This is found in plains.
   - Houses built around a central area are known as circular pattern of settlements. These are found around lakes and tanks.
   - In the places where several roads converge and houses spread out along the sides of roads in all directions we find star like pattern of settlements.

CIVICS

Chapter-1 EQUALITY

I. Fill in the blanks:

1. Humanity
2. England
3. Discrimination
4. Untouchability
5. 18

II. Match the following:

Civil Equality	Enjoyment of civil rights by all citizens.
Political Equality	Equal chance and opportunity to participate in political life.
Social Equality	Equal status in society.
Gender Equality	Men and women should be treated equally.
Economic Equality	Vast difference between income, wealth and property.

III. Answer the following in one or two lines:

1. Equality means that all human beings are equal. They have equal worth, equal social status and can enjoy the same rights and opportunities, regardless of their caste, religion, gender, race, place of birth etc., to develop their skills and talents and follow their goals and ambitions.
2. Universal Adult Franchise means that all citizens who have attained the age of 18 and above, have the Right to vote without any discrimination based on caste, religion, economic status, gender, etc.

3. The Constitution provides for joint electorates, where all the voters of a particular constituency must vote for the same candidate irrespective of his religion caste ,gender etc.

4. According to Article 21 A of the Indian Constitution, the state should provide free and compulsory education to children between the ages of 6 to 14 in such a way as the state, may by law determine. No person can be denied admission to any educational institution run by the state on the grounds of religion, gender, caste , etc.

IV. Answer the following questions:

1. In India, women are discouraged from taking up certain jobs and activities. The Government of India has stepped in with policies and programmes preventing discrimination and harassment of women in places of employment, and even encouraging them to take up higher education, opening up job opportunities for them in different fields, reserving seats for women and several other measures.

2. In a democracy equality is very important as it protects the dignity of its citizens. Very often the religion practiced, caste, economic status in life etc. are reasons why people are treated unequally. When people are treated with inequality, their dignity is violated. Dignity means self respect. It has often been defined as "the state or quality of being worthy of honour or respect. It also means the respect a citizen has to be given from others, simply because he is an important member of the community, and a fellow human being. Human dignity has prime importance as every other fundamental right is derived from this human right.

3. Articles in the Indian Constitution guaranteeing equality to all citizens are as follows:

Article	Provisions
Article 14	Guarantees equality before law and protection by law
Article15	Prohibits discrimination
Article16	Equal opportunity in matters of employment
Article17	Abolishes untouchability and its practice in any form
Article18	Abolishes titles

4. The Indian Constitution, guarantees equality to every citizen. Every individual is recognised as equal even though they may differ in caste, creed, religion, gender, economic status, educational background etc. This however does not mean that inequality does not exist or is not experienced by certain communities in our country. The daily lives of Indian citizens are far from equal, and inequalities are still visible in different ways, in our society today.

   The fight against equality is a struggle that still continues. Every measure is being taken by the government through laws and policies to ensure that people are not ill-treated or discriminated against, and that every citizen is respected and treated with dignity.

Chapter-2 POLITICAL PARTIES

I. Fill in the blanks:

1. Stasiology
2. Formal membership
3. Party Manifesto
4. articulation, aggregation
5. symbols
6. Bal Thackeray
7. Mahatma Gandhi
8. National Democratic Alliance (NDA), United Progressive Alliance (UPA)
9. Indian National Congress

II. Match the following:

Campaigning	Electoral function
Communist Party of India	Suravaram Sudhakar Reddy
Nationalist Congress Party	Sharad Pawar
Bharatiya Janata Party	Amit Shah
Communist Party of India (Marxist)	Sitaram Yetchury
Bahujan Samaj Party	Mayawati
Shiv Sena	Uddhav Thackeray
Joint candidates	Pre-election agreement

III. Answer the following in one or two lines:

1. A party that is recognized by the Election Commission and secures at least six per cent of the total votes in the Lok Sabha election, in four or more states, is called a National Party. They participate in elections all over India.

   A party that secures at least six per cent of the total votes in an election to the Legislative Assembly of a state and wins at least two seats is called a State or Regional Party. They participate in elections only within their own state. But they are recognized in the neighbouring states as well.

2. The following are the characteristics of political parties:
   - Political parties are organizations that have a formal membership.
   - They vary in size, organisation and policies.
   - The members of a political party share the same political ideologies.
   - They aim to form the government, and to exercise political power through constitutional means.
   - They work towards promoting national interests and national welfare.

3. Symbols are allotted by the Election Commission to recognised political parties and candidates for an election. These electoral symbols are easy to identify and are recognised and remembered by the voters. The Election Commission has some symbols that are reserved, and some that are free.

4. 'Articulation' means political parties educate, instruct and make the citizens aware of the party's motive.

   'Aggregation' means to bring together people from various sections, on a common platform, and make them understand their future policies.

5. If a political party fails to win a majority and acquire power, but gets the majority seats, next to the ruling party, then it is called the 'Recognized Opposition party'. All the other losing parties are collectively called Opposition parties.

IV. Answer the following questions:

1. Political parties that fail to acquire power are described as Opposition parties. They play a key role in a democratic country, like India. They act like a check and balance to the ruling party by pointing out their lapses and errors. They are expected to provide constructive criticism to help the government rule the nation effectively. Question hours and debates are conducted to arrive at alternative solutions and strategies. They keep the public abreast with every step taken by the government. Because of their importance, prominent leaders of the main Opposition parties enjoy the same privileges as that of the ruling party leaders. The leader enjoys the rank of a cabinet minister.

2. India has a Multi-party system, formed by small Regional parties. This pattern is common in France too. Political parties that wish to contest local, state or national elections are required to be registered by the Election Commission of India. If they are registered in two or three states, then they are called Regional parties. If political parties are recognized in four or more states, then they are declared National parties by the Election Commission. State parties are those which are recognized in one state alone.

3. As with any other democracy, political parties represent different sections, regions or tribes, and their core values play a key role in the politics of a country.

In India, both the Executive branch and the Legislative branch of the government are run by representatives of the political parties who have been elected by the voters. Through voting, the people of India decide which representative and which political party should run the government. Through the elections, any party may gain a single majority in the Lower House. Coalitions are formed by political parties in case no single party gains a single majority in the Lower House. Unless a single party or a coalition party has a majority in the Lower House, a government cannot be formed by that party or the coalition.

4. Independent candidates are candidates who participate in elections without the support of any party. Very rarely do the larger parties support independent candidates. In Indian politics, there are also many independent candidates who stand for elections.

   Many of the large National parties have a pre-election agreement with other smaller parties to field joint candidates in some constituencies. This is done to avoid the splitting of votes by many minor parties, thereby causing the big rival party to win.

5. Generally, there are three types of political party systems in the world. They are as follows:

Single-party System	Bi-party System	Multi -party System
In this system, only one party exists. There is no Opposition party. It has complete control over the state	In this system, there are two parties– the ruling and the Opposition.	In this system, there are more than two political parties with different policies and objectives.
Example: China	Example: The USA (The Republican Party and the Democratic Party)	Example: France and India

ECONOMICS

Chapter-1 PRODUCTION

I. Choose the correct option:

1. c. Capital
2. c. Tertiary sector
3. b. Needs
4. b. Richard Branson
5. a. Derived

II. Answer the following:

1. Factors of production describes the inputs used in the production of goods (or) services in order to make a profit. Factors of production can be categorized as:
   - Primary Factors - labour and land
   - Derived Factors - Capital and Organization
2. **Advantages**:
   - Workers are trained in one task and specialise in that area. This increases efficiency and output.
   - Less time is wasted moving from one work bench to another.

   Disadvantages:-
   - Workers can become bored doing just one job – efficiency might reduce.
   - If one person is absent and no one else can do the job, production might be stopped.
3. When the production process is split up into different tasks and each worker performs their assigned tasks. It is known as specialisation.
4. Production can be classified into three:-
   - Primary
   - Secondary
   - Tertiary (or) Service production

   a) Primary Production: - The primary sector of the economy extracts (or) harvests products from the earth. It includes the production of raw materials and basic foods.

   b) Secondary Production: - The secondary sector of the economy manufacturers finished goods.

c) Tertiary (or) Service Production: - The Tertiary sector is that part of the economy where businesses produce services.

5. Things cannot be produced unless someone makes them. Therefore labour is important.

   Labour represents the people that are available to transform resources are available to transform resources into goods (or) services that can be purchased.

6. Act of creating output- goods (or) services that satisfy the consumer's wants and needs is called utility.

Types of Utilities:

- **Form Utility**: - It is the value a consumer sees in a finished product. Eg. Sugarcane is changed to sugar, and then we consume it.
- **Place Utility**: - The process of shifting a product from one place to another, so that its utility increases is known as place utility.
- For example, the apples grown in abundance in the Himalayan valleys are transported to the southern parts of the country where there is a lot of demand for it.
- **Time Utility**: - When a commodity is stored for use in the future, we will call it time utility. Eg. Woollen clothes are stored for Winter.

7. More business would result in jobs, more generation of wealth for the nation. This would also result in the decline of poverty. Hence we need businesses.

IV. Case Study:

1. a) The two factors of production that Geeta has used was labour, land which are essentially required for production.

   b) Yes, it will help Geeta is recruiting two other people in her business.

   Reason: Geeta splits up the production work into physical labour and mental labour. So, she has work specialisation and it leads to efficiency and output.

   c) Yes, because she is a hard worker, creative maker, self-confidence and innovative person.

Brand name	Primary factors	Secondary factors	Tertiary factors
Britannia biscuits "good day"	Physical labour and mental labour are used. **Physical labour**: It includes the manual power. How the man power was used and how it is shifted from one place to another place. **Mental labour:** It includes the organisation or a control over an organisation which is important.	• Machinery • Manufacturing • Any Artificial Ingredients used. • Usage of Ingredients **Machinery:** Machinery like a lif ovens in India offers a variety of Biscuit making machines • Ingredients: Wheat flour, sugar, edible vegetable oil, nuts etc. and artificial flavours and synthetic food colour.	• Transport • Advertising • Warehousing **Warehousing**: • It may be used for storing up of Natural Ingredients • And also the finished products are stored in a place called godown (or) warehouse.

Brand name	Primary factors	Secondary factors	Tertiary factors
Britannia biscuits	**Raw materials used:**		**Transports:**
	• Wheat flour • Sugar, Vegetable oil • Butter and skimmed milk powder cashews etc.		Material Handling is the movement, storage, protection and control of materials through the process.
	“Place or land”		**Advertising:**
	The Brittania biscuits manufacturing company had its heaquartered in ‘Kolkata” (Where the business started)		• Through Televisions, Radios, Facebook and Other Social Medias. • By preparing hoardings on the centre of the areas that are catchy to the public.
	Capital:		
	It was started up with the capital of ₹ 5 Crores.		