

Mathematics (I)
Answers of Question Paper NO 2

Q 1. (A)

4

(1) $A = \{1, 2, 3, 4, 5\}, \quad B = \{5, 6, 7\}$

$\therefore A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$

(2) $\sqrt{50} = \sqrt{25 \times 2}$
 $= 5\sqrt{2}$

(3) Any trinomial of degree 7. For example, $2x^7 + x - 10$

(4) $15 : 20 = \frac{15}{20} = \frac{15 \times 5}{20 \times 5} = \frac{75}{100}$ That is, 75%

(5) $3x + 5y = 9$ (1)

$5x + 3y = 7$ (2)

$\frac{8x + 8y = 16}{\dots\dots\dots}$ Adding (1) and (2)

$x + y = 2$ dividing by 8

(6) The lower and upper class limits of class 35 to 40 are 35 and 40 respectively.

(B)

4

(1) Mean $= \frac{10 + 7 + 5 + 3 + 9 + 6 + 9}{7}$
 $= \frac{49}{7}$

\therefore Mean of yield per acre prouce is 7 quintals.

(2) Suppose, the amount sent to Alka every month is x . She spends 90% of it.

\therefore She saves 10 % of the amount, which is ₹ 120

$\therefore 120 = x \times \frac{10}{100}$

$\therefore 120 \times 10 = x$

$\therefore x = 1200$

\therefore Amount sent to Alka every month is ₹ 1200.

(3) $P(y) = y^2 - 2y + 5$

$\therefore P(2) = 2^2 - 2 \times 2 + 5$

$= 4 - 4 + 5$

$= 5$

Q. 2 (A)

4

(1) C

(2) A

(3) A

(4) C

(B)

(1) Let A be the event that a card selected at random is a spade.

In given example, $n(S) = 52$

$$\therefore n(A) = 13$$

$$\therefore P(A) = \frac{n(A)}{n(S)} = \frac{13}{52} = \frac{1}{4}$$

(2)

Age Group (Yrs.)	No. of persons	Measure of central angle
20-25	80	$\frac{80}{200} \times 360 = 144^\circ$
25-30	60	$\frac{60}{200} \times 360 = 108^\circ$
30-35	35	$\frac{35}{200} \times 360 = 63^\circ$
35-40	25	$\frac{25}{200} \times 360 = 45^\circ$
Total	200	

(3) The MV of a share is Rs. 200

$$\therefore \text{Brokerage} = 200 \times \frac{0.3}{100} = 0.60 \text{ rupees.}$$

$$\therefore \text{Purchase value of a share} = 200 + 0.60 = ₹ 200.60$$

Q. 3 (A)

4

(1) $x - y = 1$

x	0	$\boxed{1}$
y	$\boxed{-1}$	0
(x, y)	$\boxed{(0, -1)}$	$\boxed{(1, 0)}$

(2) In the A.P. 1,3,5,...,149

$$a = 1, d = \boxed{2}, t_n = 149$$

$$t_n = a + (n-1)d$$

$$149 = \boxed{1 + (n-1) \times 2}$$

$$149 = 1 + 2n - 2$$

$$149 = 2n - \boxed{1}$$

$$\therefore 2n = 150$$

$$\therefore n = \boxed{75}$$

(3) $\therefore n(S) = \boxed{42}$

$$\therefore n(A) = \boxed{3}$$

$$\therefore P(A) = \frac{\boxed{n(A)}}{\boxed{n(S)}}$$

$$\therefore P(A) = \frac{\boxed{1}}{\boxed{14}}$$

Q. 3 (B)

4

(1) $5m^2 - 22m - 15 = 0$

$$\therefore 5m^2 - 25m + 3m - 15 = 0$$

$$\therefore 5m(m - 5) + 3(m - 5) = 0$$

$$\therefore (m - 5)(5m + 3) = 0$$

$$\therefore m - 5 = 0 \text{ or } 5m + 3 = 0$$

$$\therefore m = 5 \text{ or } m = \frac{-3}{5}$$

(2) $3x - 4y = 10$

$$4x + 3y = 5$$

$$\therefore Dx = \begin{vmatrix} 10 & -4 \\ 5 & 3 \end{vmatrix} = 10 \times 3 - 5 \times (-4) = 30 + 20 = 50$$

$$\therefore Dy = \begin{vmatrix} 3 & 10 \\ 4 & 5 \end{vmatrix} = 3 \times 5 - 4 \times 10 = 15 - 40 = -25$$

$$(3) \quad a = 10,000, \quad d = 2000, \quad S_{12} = ?$$

$$\begin{aligned} S_n &= \frac{n}{2}[2a + (n-1)d] \\ \therefore S_{12} &= \frac{12}{2}[2 \times 10,000 + (12-1) \times 2000] \\ &= 6(20,000 + 11 \times 2000) \\ &= 6(20,000 + 22,000) \\ &= 6 \times 42,000 \\ &= 2,52,000 \end{aligned}$$

Q. 4

9

$$(1) \quad x^2 - 2x - 7 = 0$$

Here, $a = 1, b = -2, c = -7$

$$\alpha + \beta = \frac{-b}{a} = \frac{-(-2)}{1} = 2$$

$$\alpha \beta = \frac{c}{a} = \frac{-7}{1} = -7$$

$$\begin{aligned} \alpha^2 + \beta^2 &= (\alpha + \beta)^2 - 2\alpha\beta \\ &= (2)^2 - 2 \times (-7) \\ &= 4 + 14 \\ &= 18 \end{aligned}$$

(2) In three digit natural numbers, the numbers divisible by 5 are 100, 105, ..., 995.

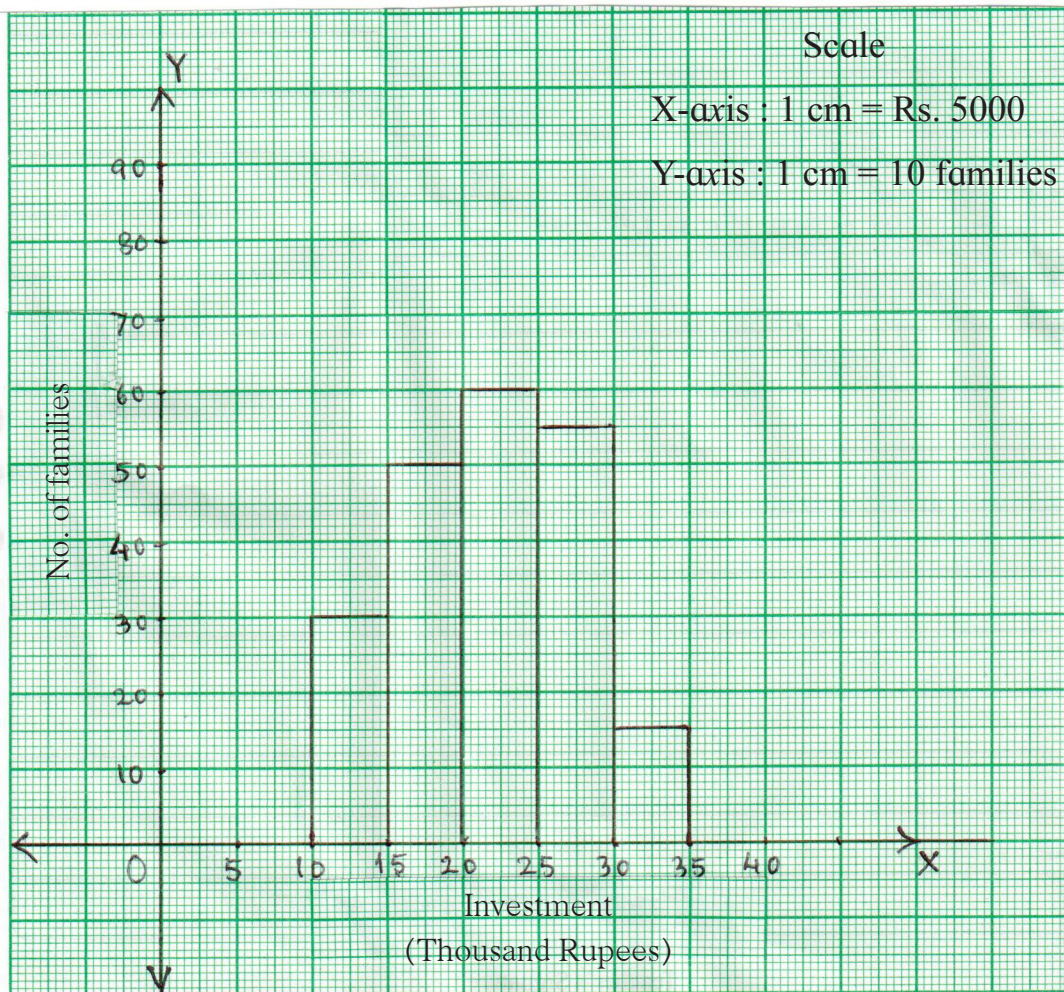
This is an A.P. with $a = 100, d = 5$ and $t_n = 995$

$$\begin{aligned} t_n &= a + (n-1)d \\ \therefore 995 &= 100 + (n-1)5 \\ \therefore 995 - 100 &= (n-1)5 \\ \therefore \frac{895}{5} &= n-1 \end{aligned}$$

$$\therefore 179 = n - 1$$

$$\therefore n = 180 \quad \therefore \text{there are } 180 \text{ numbers.}$$

(3) Histogram



- (4) The sample space,
 $S = \{10, 12, 13, 14, 20, 21, 23, 24, 30, 31, 32, 34, 40, 41, 42, 43\}$
 $\therefore n(S) = 16$
Let A be the event that the number is a prime.
 $\therefore A = \{13, 23, 31, 41, 43\}$
 $\therefore n(A) = 5$
 $\therefore P(A) = \frac{n(A)}{n(S)} = \frac{5}{16}$

Q. 5

4

- (1) Suppose, Vivek completes a work in x days.
Yogesh completes the same work in $(x + 3)$ days.

$$\therefore \text{Work done by Vivek in one day} = \frac{1}{x}$$

$$\text{and work done by Yogesh in one day} = \frac{1}{x+3}$$

$$\text{Work done by both of them together in one day} = \frac{1}{2}$$

from the given condition,

$$\frac{1}{x} + \frac{1}{x+3} = \frac{1}{2}$$

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

$$\therefore \frac{2x+3}{x^2+3x} = \frac{1}{2}$$

$$\therefore x^2 + 3x = 2(2x + 3)$$

$$\therefore x^2 + 3x = 4x + 6$$

$$\therefore x^2 + 3x - 4x - 6 = 0$$

$$\therefore x^2 - x - 6 = 0$$

$$\therefore x^2 - 3x + 2x - 6 = 0$$

$$\therefore x(x-3) + 2(x-3) = 0$$

$$\therefore (x-3)(x+2) = 0$$

$$\therefore x - 3 = 0 \text{ or } x + 2 = 0$$

$$\therefore x = 3 \text{ or } x = -2$$

$$\text{or, } a = 1, b = -1, c = -6$$

$$\begin{aligned} \therefore x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{1 \pm \sqrt{(-1)^2 - 4(1)(-6)}}{2} \\ &= \frac{1 \pm \sqrt{25}}{2} \end{aligned}$$

$$\therefore x = \frac{1+5}{2} = 3 \text{ or } x = \frac{1-5}{2} = -2$$

but the number of days is not negative

$$\therefore x = 3$$

$$\therefore x + 3 = 3 + 3 = 6$$

\therefore Vivek completes the work in 3 days and Yogesh in 6 days.

(2)

Age (Yrs.)	No. of patients (Frequency)	Cumulative frequency (Less than)
10-20	40	40
20-30	32	72
30-40	35	107
40-50	45	152
50-60	33	185
60-70	15	200

Here $N = 200 \therefore$ the number $\frac{N}{2} = 100$ which is included in the class 30-40

\therefore median class is 30 - 40

$\therefore L = 30, cf = 72, f = 35, h = 10$

$$\begin{aligned}\text{Median} &= L + \left[\frac{\frac{N}{2} - cf}{f} \right] \times h \\ &= 30 + \left(\frac{100 - 72}{35} \right) \times 10 \\ &= 30 + \frac{28 \times 2}{7} \\ &= 30 + 4 \times 2 \\ &= 30 + 8 = 38\end{aligned}$$

\therefore median of ages of patients is 38.

Q. 6 (1)

3

(1) For Krishna Electronics :

Marked price of TV set = ₹ 50000

Discount = $50000 \times \frac{10}{100} = ₹. 5000$

The taxable value of the TV set = $50000 - 5000 = ₹ 45000$

Input Tax = $36000 \times \frac{18}{100} = ₹ 6480$

Output tax = $45000 \times \frac{18}{100} = ₹ 8100$

- (2) Example : The sum of present ages of Madhu and Raju is 11 years. Madhu is elder than Raju by 9 years. Find their present ages.

Solution : Let the present age of Madhu be x years and the age of Raju be y years..

$$\therefore x + y = 11 \quad \text{.....(I)}$$

$$x - y = 9 \quad \text{.....(II)}$$

$$2x = 20 \quad \text{adding (I) and (II)}$$

$$\therefore \underline{x = 10}$$

$$x + y = 11$$

$$\therefore 10 + y = 11$$

$$\therefore y = 11 - 10$$

$$\therefore y = 1$$

\therefore Present age of Madhu is 10 years and of Raju is 1 year.

Maths 10th Std (Part II)
Specimen Answers of Question Paper No. 2

Q. 1 (A)

4

- (1) line PQ \parallel line RS
 $\therefore x = 50^\circ$ (Corresponding angle)
- (2) $\triangle ABC$ and $\triangle PQR$ are congruent by hypotenuse side test.
- (3) In $\triangle ABC$, $\angle A = 65^\circ$, $\angle B = 40^\circ$
 $\angle A + \angle B + \angle C = 180^\circ$
 $\therefore 65^\circ + 40^\circ + \angle C = 180^\circ$
 $\therefore \angle C = 180^\circ - 105^\circ$
 $\therefore \angle C = 75^\circ$
- (4) $\square PQRS$ is a parallelogram.
 $\therefore \angle P + \angle Q = 180^\circ$ (Sum of measures of interior angles is 180°)
- (5) Radius = $\frac{1}{2} \times$ hypotenuse (The circumcentre of a right angled triangle is the mid-point of its hypotenuse)
 $= \frac{1}{2} \times 5$
 $= 2.5$
- (6) The co-ordinates of point of intersection of $x = 2$ and $y = -3$ are $(2, -3)$.

(B)

4

- (1) Let breadth of the tank be x .
 \therefore Length of the tank = $2x$.
Area of the walls of the tank = $2(\text{length} + \text{breadth}) \times \text{depth}$.
 $\therefore 108 = 2(2x + x) \times 3$
 $\therefore 108 = 18x \quad \therefore x = 6 \quad \therefore 2x = 12$
 \therefore Length of the tank = 12m.

$$\therefore x^2 = 200$$

$$\therefore x = 10\sqrt{2} \text{ cm.}$$

$$\text{Perimeter of square} = 4 \times 10\sqrt{2} = 40\sqrt{2}$$

$$(i) \text{ Side of square} = 10\sqrt{2} \text{ cm.}$$

$$(ii) \text{ Perimeter of square} = 40\sqrt{2} \text{ cm.}$$

(3) In figure, PQ = 12, PR = 8

$$PQ^2 = PR \times PS \quad \dots\dots\dots (\text{Tangent secant theorem})$$

$$\therefore 12^2 = 8 \times PS$$

$$\therefore 144 = 8 \times PS$$

$$\therefore PS = \frac{144}{8}$$

$$\therefore PS = 18$$

Q. 3 (A)

4

(1) From the figure,

$$(i) m(\text{arc AXB}) = \boxed{110^\circ}$$

$$(ii) m(\text{arc CAB}) = \boxed{155^\circ}$$

$$(iii) \angle COB = \boxed{155^\circ}$$

$$(iv) m(\text{arc AYB}) = \boxed{250^\circ}$$

(2) $\square ABCD$ is a cyclic quadrilateral.

$$\therefore \angle ADC + \angle ABC = 180^\circ$$

$$\therefore 120 + \angle ABC = 180^\circ$$

$$\therefore \angle ABC = \boxed{60^\circ}$$

$$\text{But } \angle ACB = \boxed{90^\circ} \quad \dots\dots\dots (\text{Angle in semicircle})$$

In $\triangle ABC$,

$$\angle BAC + \angle ACB + \angle ABC = 180^\circ$$

$$\therefore \angle BAC + 90^\circ + 60^\circ = 180^\circ$$

$$\therefore \angle BAC + \boxed{150^\circ} = 180^\circ$$

$$\therefore \angle BAC = 180^\circ - 150^\circ$$

$$\therefore \angle BAC = \boxed{30^\circ}$$

(3) From the graph

Sr. no.	First point	Second point	Co-ordinates of first point (x_1, y_1)	Co-ordinates of second point (x_2, y_2)	$\frac{y_2 - y_1}{x_2 - x_1}$
1	C	E	(1, 0)	(3, 4)	$\frac{4}{2} = 2$
2	A	B	(-1, -4)	(0, -2)	$\frac{2}{1} = 2$
3	B	D	(0, -2)	(2, 2)	$\frac{4}{2} = 2$

\therefore For any two points (x_1, y_1) and (x_2, y_2) on a line graph, the ratio

$\frac{y_2 - y_1}{x_2 - x_1}$ is always constant.

Q. 3 (B)

4

(1) If $\tan\theta = \frac{3}{4}$

$$1 + \tan^2\theta = \sec^2\theta$$

$$\therefore 1 + \left(\frac{3}{4}\right)^2 = \sec^2\theta$$

$$\therefore 1 + \frac{9}{16} = \sec^2\theta$$

$$\therefore \frac{25}{16} = \sec^2\theta$$

$$\therefore \sec\theta = \frac{5}{4}$$

(2) Measure of arc = 90°

Radius of circle = 14 cm

$$\begin{aligned} \text{Length of arc} &= \frac{\theta}{360} \times 2\pi r \\ &= \frac{90}{360} \times 2 \times \frac{22}{7} \times 14 \\ &= 22 \text{ cm} \end{aligned}$$

(3) $MN = 5, PN = 7, MQ = 2.5, QP = ?$

From the figure $\frac{MN}{NP} = \frac{MQ}{QP}$ (Angle bisector theorem)

$$\therefore \frac{5}{2.5} = \frac{7}{QP}$$

$$\therefore 5 \times QP = 7 \times 2.5$$

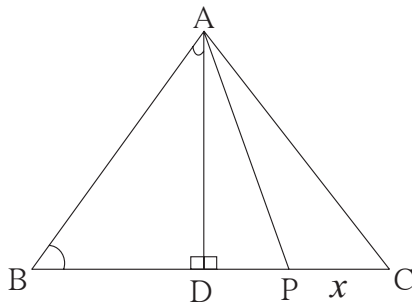
$$\therefore QP = \frac{7 \times 2.5}{5}$$

$$\therefore QP = 3.5$$

Q. 4

9

(1)



$$PC = \frac{1}{3} BC, AB = 6$$

ΔABC is an equilateral triangle.

$$\therefore AB = BC = AC = 6$$

$$\therefore PC = \frac{1}{3} BC = \frac{1}{3} \times 6 = 2$$

Draw Seg $AD \perp$ Seg BC .

In ΔDAC , $\angle ADC = 90^\circ, \angle ACB = 60^\circ \therefore \angle DAC = 30^\circ$

$$\therefore DC = \frac{1}{2} \times AC = \frac{1}{2} \times 6 = 3 \text{}(30^\circ, 60^\circ, 90^\circ \text{ theorem})$$

$$\therefore DP = DC - PC = 3 - 2 = 1.$$

$$\text{Now, } AD = \frac{\sqrt{3}}{2} \times AC = \frac{\sqrt{3}}{2} \times 6 = 3\sqrt{3}$$

In ΔADP

$$AP^2 = AD^2 + DP^2 \text{(Pythagoras theorem)}$$

$$= (3\sqrt{3})^2 + 1^2$$

$$= 9 \times 3 + 1$$

$$= 28$$

$$\therefore AP = \sqrt{28} = 2\sqrt{7} \text{ cm}$$

$$(2) \quad 3AX = 2BX$$

$$\therefore \frac{AX}{BX} = \frac{2}{3}$$

$$\therefore \frac{AX+BX}{BX} = \frac{3+2}{3} \quad \dots\dots\dots(\text{By componendo})$$

$$\therefore \frac{AB}{BX} = \frac{5}{3}$$

In $\triangle BCA$ and $\triangle BYX$,

$$\angle B \cong \angle B$$

$$\angle BCA \cong \angle BYX \quad \dots\dots\dots (\text{Corresponding angles})$$

$$\therefore \triangle BCA \sim \triangle BYX \quad \dots\dots\dots (\text{A-A test of similarity})$$

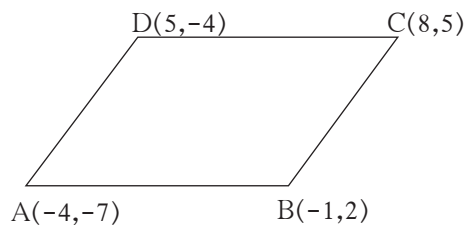
$$\therefore \frac{BA}{BX} = \frac{AC}{XY}$$

$$\therefore \frac{5}{3} = \frac{AC}{9}$$

$$\therefore 3 \times AC = 45$$

$$\therefore AC = 15$$

(3)



$$\begin{aligned} AD &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ &= \sqrt{(5+4)^2 + (-4+7)^2} \\ &= \sqrt{81+9} \\ &= \sqrt{90} \\ &= 3\sqrt{10} \quad \dots\dots\dots(1) \end{aligned}$$

$$\begin{aligned} BC &= \sqrt{(8+1)^2 + (5-2)^2} \\ &= \sqrt{81+9} \\ &= \sqrt{90} \\ &= 3\sqrt{10} \quad \dots\dots\dots(2) \end{aligned}$$

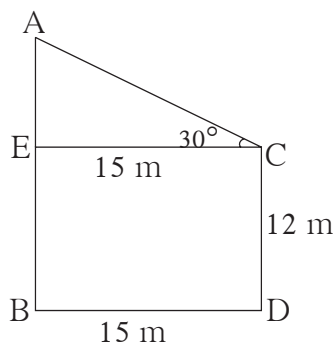
$$\begin{aligned}
 AB &= \sqrt{(-1+4)^2 + (2+7)^2} \\
 &= \sqrt{9+81} \\
 &= \sqrt{90} \\
 &= 3\sqrt{10} \quad \dots\dots\dots(3)
 \end{aligned}$$

$$\begin{aligned}
 CD &= \sqrt{(8-5)^2 + (5+4)^2} \\
 &= \sqrt{9+81} \\
 &= \sqrt{90} \\
 &= 3\sqrt{10} \quad \dots\dots\dots(4)
 \end{aligned}$$

From (1), (2), (3) and (4); $AB = BC = CD = DA$

\therefore $\square ABCD$ is a rhombus.

(4)



As shown in the figure, suppose AB and CD are the buildings. Distance between AB and CD is 15 m. Angle of elevation at point C is 30° .

$$\angle ECA = 30^\circ \quad EC \perp AB.$$

$$BD = 15 \text{ m.} \quad \therefore EC = 15 \text{ m.}$$

$$CD = 12 \text{ m.} \quad \therefore BE = 12 \text{ m.}$$

In $\triangle AEC$,

$$\tan 30 = \frac{AE}{EC}$$

$$\therefore \frac{1}{\sqrt{3}} = \frac{AE}{15}$$

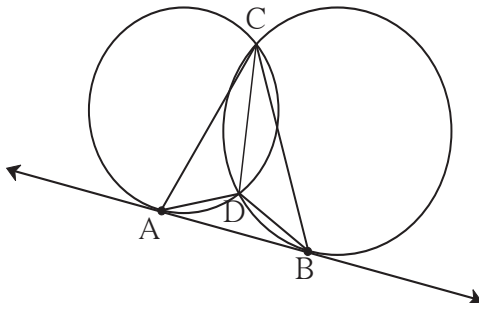
$$\therefore \sqrt{3} \times AE = 15$$

$$\therefore AE = \frac{15}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 5\sqrt{3}$$

Height of the second building = $BE + AE = (12 + 5\sqrt{3}) \text{ m.}$

Q. 5 (1)

4



Draw seg CD.

$$\begin{aligned} \angle DAB &= \angle ACD \dots (1) \\ \angle DBA &= \angle DCB \dots (2) \end{aligned} \left. \begin{array}{l} \text{Tangent secant} \\ \text{angle theorem} \end{array} \right\}$$

From (1) and (2)

$$\angle DAB + \angle DBA = \angle ACD + \angle DCB$$

$$\text{Now, } \angle ACB = \angle ACD + \angle DCB \dots (3)$$

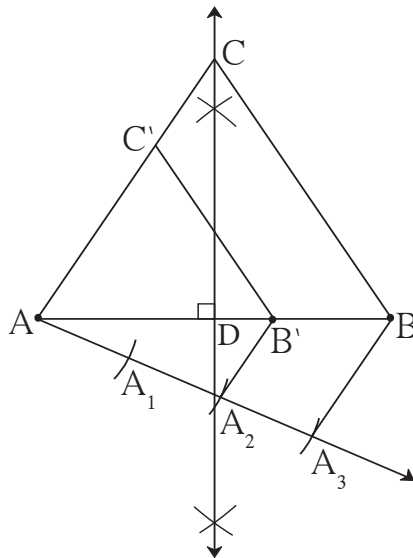
In $\triangle ADB$,

$$\angle DAB + \angle DBA + \angle ADB = 180^\circ \dots (\text{Sum of angles of a triangle.})$$

$$\therefore \angle ACD + \angle DCB + \angle ADB = 180^\circ \dots \text{From (1) and (2)}$$

$$\therefore \angle ACB + \angle ADB = 180^\circ \dots \text{From (3)}$$

(2)



Q. 6

3

(1) For barrel : Height = 50 cm, Radius of base = 20 cm

$$\therefore \text{Volume of barrel} = \pi r^2 h = \pi \times (20)^2 \times 50 = 400 \times 50 \times \pi$$

For mug : Height = 15 cm, Diameter of base = 10 cm

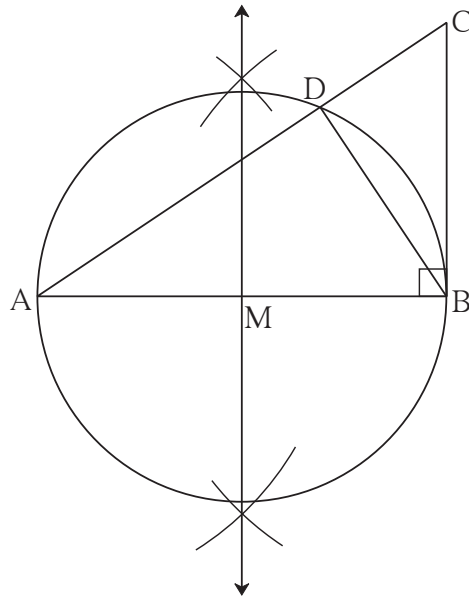
\therefore Radius of Base = 5 cm

$$\therefore \text{Volume of mug} = \pi r^2 h = \pi \times (5)^2 \times 15 = 25 \times 15 \times \pi$$

$$\frac{\text{Volume of barrel}}{\text{Volume of mug}} = \frac{400 \times 50 \times \pi}{25 \times 15 \times \pi} = \frac{160}{3} = 53\frac{1}{3}$$

\therefore when 54th mug is poured in the barrel it will overflow.

(2)



Seg $BD \perp$ Seg AC

$\therefore \triangle ADB$ is a right angled triangle.

\therefore Seg AB is a diameter of the circle passing through the points A, B and D

\therefore Seg MB is a radius of the circle.

$\angle MBC$ is a right angle(Given)

\therefore line CB is a tangent of the circle.

☆☆☆

Activity Sheet 2

Time : 2 Hrs

Science and Technology Part 1

Marks : 40

Instructions :

1. It is **necessary** to solve all the questions.
2. Draw **neat and labelled diagrams** wherever necessary.
3. Start every new main question **on separate page**.
4. Figures on the right indicate marks.
5. For each Multiple Choice Question (1.B), **ONLY first answer** will be considered.
6. Write answer of each MCQ **with option number**.

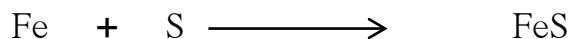
Eg. i) a. ii) c.

Q. 1 A) Solve the following questions.

05

i) If $g = GM/r^2$ then where will the value of g be high at Goa Beach or on top of Mount Everest?

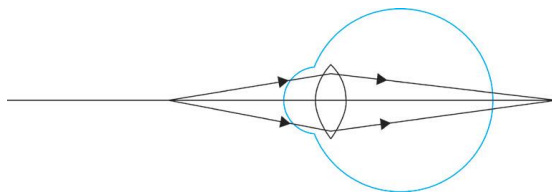
ii) Identify from the following reactions the reactants that undergo oxidation and reduction?



iii) Find the odd one out and justify it.

Fuse wire, M.C.B., Rubber Gloves, Generator

iv) Name the defect shown in the diagram.



v) Molecular formula of Propane is C_3H_8 , write the structural formula of propane.

B) Choose and write the correct option.

05

(i) The halogen which is liquid at room temperature is

- a) fluorine b) astatine c) bromine d) iodine

(ii) Which of the following process to be carried out to avoid the formation of greenish layer on brass vessels due to corrosion?

- a) plating b) anodization c) tinning d) alloying

(iii) What type of reaction is shown below?



- a) Addition b) Substitution c) Decomposition d) Reduction

(iv) The temperature of ice can be decreased below 0°C by mixing in it.

- a) saw dust b) sand c) salt d) coal

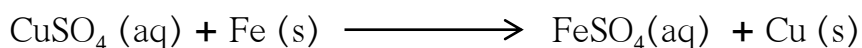
(v) The image obtained while finding the focal length of convex lens is

- a) a real and erect. b) virtual and erect.
c) real and inverted. d) virtual and inverted.

Q.2 Solve ANY FIVE from the following questions.

10

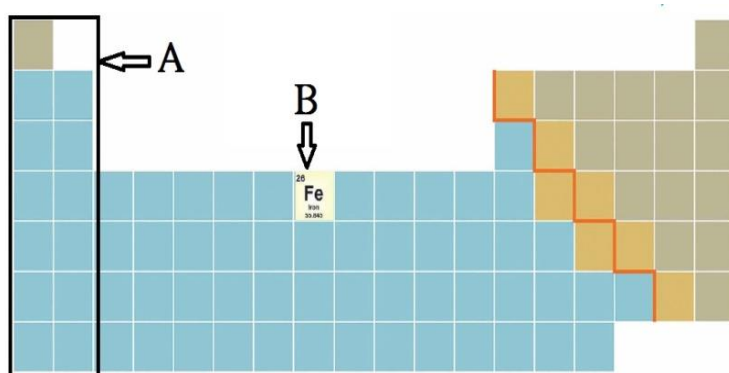
i) Observe the following reaction and answer the following questions.



- Identify and write the type of chemical reaction.
- Write the definition of above reaction.

ii) Light travels with a velocity 1.5×10^8 m/s in a medium. On entering second medium its velocity becomes 0.75×10^8 m/s. What is the refractive index of the second medium with respect to the first medium?

iii) Observe the figure and answer the following questions.



- Identify the block shown by box A and write an electronic configuration of any one element of this block.
- Identify the block of element denoted by letter B and write its period number.

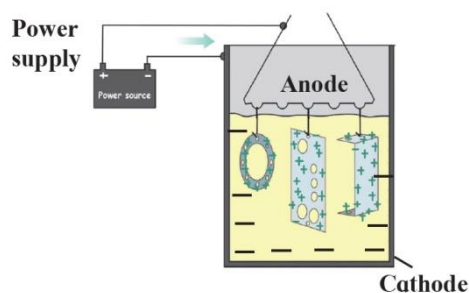
iv) Write the IUPAC names of following hydrocarbons.



v) Why does tungsten metal used to make solenoid type coil in an electric bulb?

vi) Mahendra and Virat are sitting at a distance of 1 metre from each other. Their masses are 75 kg and 80 kg respectively. What is the gravitational force between them? $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$

vii) Identify the process shown in the diagram and explain it in short.

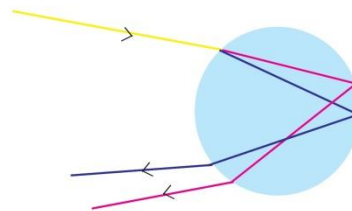


Q.3 Solve ANY FIVE from the following questions.

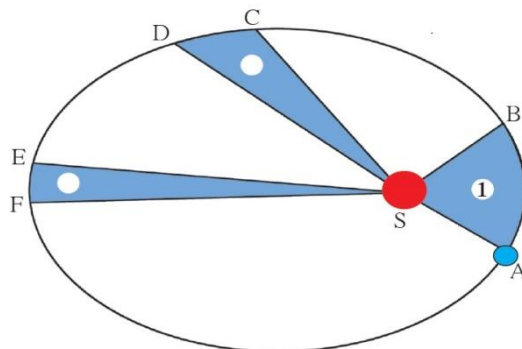
15

i) Observe the given figure and answer the following questions.

- Identify and write the natural process shown in the figure.
- List the phenomena which are observed in this process.
- Redraw the diagram and show above phenomena in it.



ii) Identify the law shown in the figure and state three respective laws.



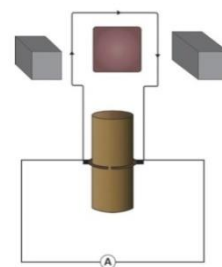
iii) An element has its electron configuration as 2,8,8,2. Now answer the following questions.

- What is the atomic number of this element?
- What is the group of this element?
- To which period does this element belong?

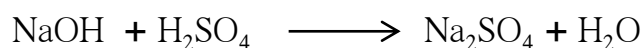
iv) Write the importance of artificial satellites in your words.

v) Observe the figure and answer the following questions.

- Identify the machine shown in figure.
- Write a use of this machine.
- How transformation of energy takes place in this machine.



vi) Balance the following equation stepwise.



vii) Identify the process given in following passage and draw neat labelled diagram showing the process.

Electrolysis of molten mixture of alumina (melting point $> 2000^\circ\text{C}$) is done in a steel tank. The tank has a graphite lining on the inner side. This lining does the work of a cathode. A set of graphite rods dipped in the molten electrolyte works as anode. Cryolite (Na_3AlF_6) and fluorspar (CaF_2) are added in the mixture to lower its melting point upto 1000°C .

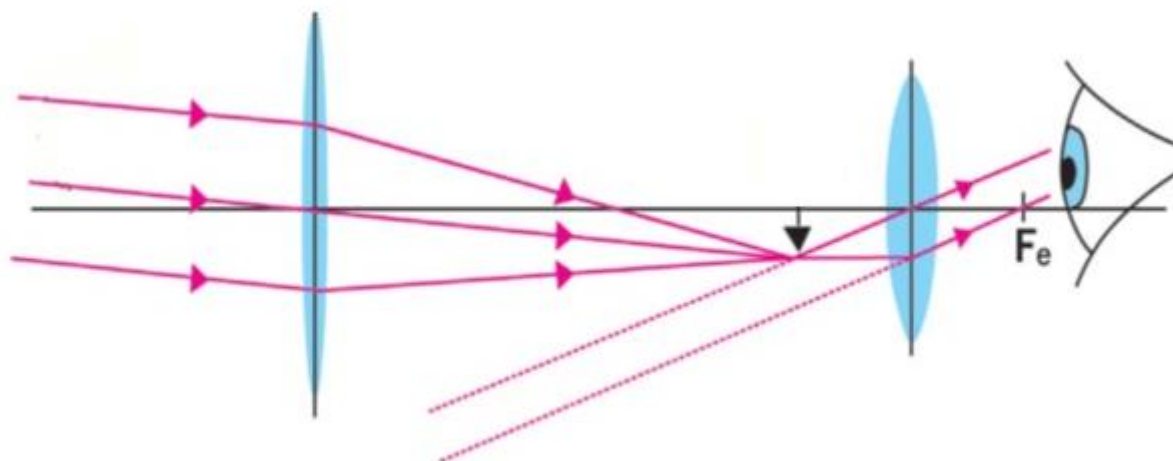
i) Read the following paragraph and answer the questions.

If heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy.

The change in temperature continues till the temperatures of both the objects attain the same value. In this process, the cold object gains heat energy and the hot object loses heat energy. If the system of both the objects is isolated from the environment by keeping it inside a heat resistant box, then no energy can flow from inside the box or come into the box.

- a) Heat is transferred from where to where? 01
- b) Which principle do we learn about from this process? 01
- c) How will you state the principle briefly? 02
- d) Which property of the substance is measured using this principle? 01

ii) Observe the following figure and answer the questions.



- a) Which optical instrument shows arrangement of lenses as shown in the figure? 01
- b) Write in brief the working of this optical instrument. 02
- c) How can we get different magnifications in this optical instrument? 01
- d) Draw the figure again and labelled it properly 01

***** The End *****

MODEL ANSWERSHEET
ACTIVITY SHEET # 2
SCIENCE & TECHNOLOGY, PART-2

Que1 A) Attempt the following.

5

- i. Survival of fittest : Darwin : Acquired characters :

Answer: Lamarck

- ii. Why the bryophytes are called as amphibians of kingdom plantae?

Ans: Bryophytes grow on the moist soil but need water for sexual reproduction. Hence, they are called as amphibians of kingdom plantae.

- iii. Identify the odd. Stigma, Style, Pollen, Ovary.

Ans: Pollen (Remaining are parts of gynaecium)

- iv. What are stem cells?

Ans: Stem cells- Such cells in the body of multicellular animals, which give rise to other various types of cells are stem cells.

- v. State whether true or false– Flow of nutrients in an ecosystem is unidirectional.

Ans: Statement is wrong.

Que 1. B) Write the correct option from the given multiple options to each question. 5

- i. We getenergy from carbohydrates.

a) 9 kcal / gm b) 9 cal / gm c) 4cal / gm d) 4 kcal / gm

Ans: d) 4Kcal/gm

- ii. Which of the following is not the source of green energy?

a) Wind. b) Natural gas. c) Sunlight. d) Fossil fuel.

Ans: d) Fossil fuel

- iii. Vegetative propagation is performed with the help ofin sweet potato.

a) root b) stem c) leaf d) flower.

Ans: a) Root

- iv. Which of the following vitamin is necessary for synthesis of NADH₂?

a) Vitamin B₂ b) Vitamin B₅ c) Vitamin C d) Vitamin K

Ans: b) Vitamin B₅

- v. Maximum effect of alcohol occurs on system.

- a) nervous b) excretory c) respiratory d) muscular

Ans: a) Nervous

Que 2. Attempt the following (Any five)

10

1. Write the forms to which following food materials are converted after digestion.

1. Milk 2. Potato. 3. Oil. 4. Chapati

Ans: 1. Milk- Amino acids, sugar, fatty acids.

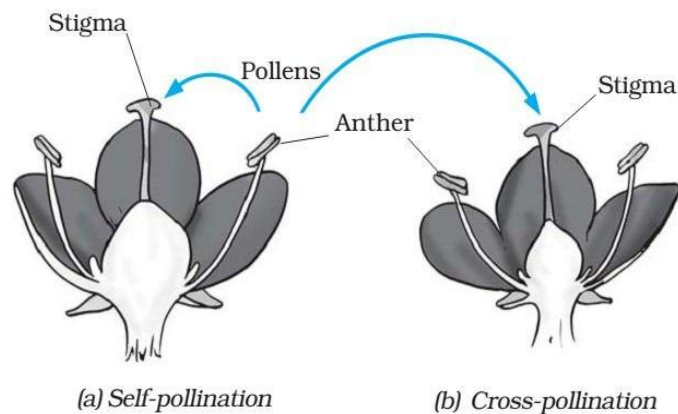
2. Potato- Glucose.

3. Oil- Fatty acids

4. Chapati- Glucose

2. Sketch and label the diagram showing self- and cross-pollination.

Ans:



3. If a piece of bread is kept in a container in moist place for 2 – 3 days,

1. What will you see? 2. Write scientific name and a character of the organism you may observe.

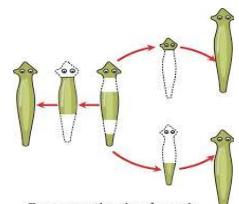
Ans: 1. White fibres will be seen growing on piece of bread.

2. Scientific name – A fungus- 'Mucor', It is saprotrophic / devoid of chloroplast / It has fibrous body.

4. Observe the following picture and describe the type of reproduction shown in.

Ans: Regeneration in Planaria is shown in picture.

Under certain circumstances, its body cuts in to two parts. Each part regenerates the cut part and thereby two planaria are formed.



5. Write any two points of differences between flat worms and round worms.

Ans:–

Flat worms	Round worms
1. Leaf-like flat body.	1. Thread-like, cylindrical body.
2. No coelom.	2. False coelom is present

6. Explain the meanings of 'symbols A' & 'B'.



Ans: A) Green energy– Eco-friendly and inexhaustible source of energy.

B) Save water– It is very important to use water judiciously due to ever-increasing water-scarcity.

7. Which businesses will you start near the agro-tourism center?

Ans: Hotel, plant-nursery, fruit and vegetable stall, ayurvedic medicine stall, production and sales of pickle-papad-jam & jelly, fruit juice, etc., bullock-cart ferry, etc. can be started near the agro-tourism center.

Que 3. Attempt the following (Any five)

15

1. Observe the picture and answer the following questions.

- A) Which evidence of evolution is shown in the picture?
- B) What can be proven with this proof?
- C) Give one more example of evidence of evolution



Ans:

A) Embryological evidence of evolution has been shown in the picture.

B) Similarities between all embryos in early stages indicates that all those animals may have common ancestor.

C) Vestigial organs, Connecting link, etc.

2. Write six strategies implemented by you for conservation of environment.

Ans: Strategies implemented for environmental conservation - Conservation, Control, Production, Preservation, Prevention, and Awareness.

3. What is shown in the picture? Write name and trophic level of each component.

Ans: Food chain is shown in the picture.

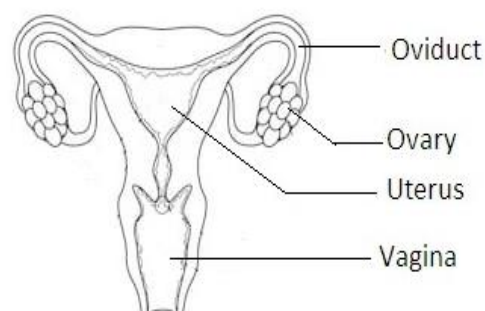
Green plant– Producer, Grasshopper– Primary consumer, Small bird– Secondary consumer, Snake– Tertiary consumer, Owl– Top consumer.



4. Sketch and label human female reproductive system.

Is the woman responsible for sex-determination of child? Justify your answer.

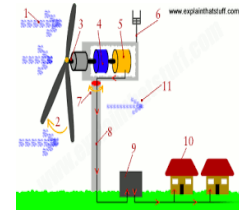
Ans:



Woman is not responsible for sex-determination. Man produces two types of sperms as 22+X or 22+Y, whereas woman produces only 22+X types of ova. Female embryo is produced by union of 22+X sperm and 22+X ovum. Male embryo is produced by union of 22+Y sperm and 22+X ovum. Thus, sex of the embryo depends upon sperms of man.

5. Answer the questions with the help of picture.

- A) Which type of energy is produced?
- B) This power plant is based on which energy source?
- C) Is this power plant eco-friendly? How?



**Ans: A) Electric energy is produced.
 B) It is based on wind power.
 C) This power plant is eco-friendly as it is pollution-free, and wind is inexhaustible source of energy.**

6. How the excessive use of social media and technology is proving harmful?

Ans: – misuse of time, developing habit of watching obscene material on internet, increase in cyber crimes, persons become self-centred an autistic, people are becoming more violent due to wrong cartoons and games, people are becoming more dependent on machines, self-reliance is on the decline.

7. Where and in which forms the amino acids formed after digestion of food are used in the body?

Ans:

Amino acids formed after digestion of food are used in our body as follows–

Blood– Haemoglobin, Antibodies.

Skin– Melanin pigment, Keratin

Bones– Ossien

Cells– Enzymes & proteins

Pancreas– Insulin, Trypsin

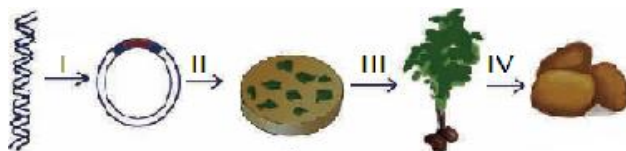
Pituitary gland– Various hormones

Muscles– Flexible proteins- Myosin & Actin.

Que. 4. Attempt the following. (Any one)

5

1.



A) Which process is shown in the above figure?

B) Describe in brief the steps- I , II , III & IV.

Ans:

A) Production of edible vaccines is shown in the figure.

B) Steps-

I) Isolation of desired gene from human pathogen and transfer of it to plant virus.

II) Infection of the pieces of leaves of potato by the transgenic virus.

III) Development of new potato plant from the infected leaves of potato which will contain the gene from human pathogen.

IV) Consumption of such raw potato gives immunity against the pathogen.

2. Observe the images 'A' & 'B' and answer the following questions.



i) Which disasters are shown in the images?

ii) Which primary precautions will you take in case of disaster shown in 'A'?

iii) Which type of first-aid is offered to the injured peoples in disaster 'B'?

ANS:

i) Earthquake is shown in the image 'A' whereas fire is shown in 'B'.

ii) Precautions to be taken during earthquake- Do not helter-skelter, be calm, hide below the table / cot, switch-off the power supply, use torch if necessary instead of lamps burning fossil fuels. Stay in the vehicle if in journey; do not stop near building / trees / electric poles.

iii) If fire is caught by clothing of victim, douse it with water, wash the burn-wounds with clean water, offer water to drink, clean the wounds with antiseptic solution, cover it with clean, dry bandage, contact the doctor.