

**ASAN**  
**CADET**  
**COLLEGES PREPARATION**  
**GUIDE**  
ALONG WITH A BANK OF 3000+ MCQ'S

**MODEL PAPERS**

**MATHEMATICS &  
GENERAL SCIENCE**

For Students seeking Admission in  
**Cadet/Military/PAF Colleges**

**8th**

By:

★ Dr. Mahmood Hussain  
★ Engr. Khawar Mahmood

Academic Solutions And Assessment Network (ASAN)



**ASAN**

# Model Papers

**FOR CADET COLLEGES  
ADMISSION TESTS**

**MATHEMATICS & G. SCIENCE**

**FOR CLASS 8TH**

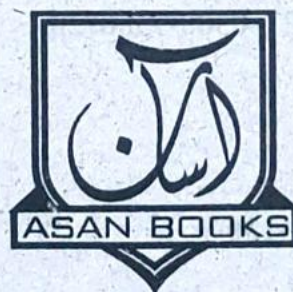
- ❖ FOR ENTRANCE EXAMINATION - 8TH CLASS / GCE 'O' LEVEL  
**Also recommended for Admission in**
- ❖ CADET - MILITARY - PAF - PAKISTAN NAVY COLLEGES
- ❖ LAWRENCE COLLEGE, GHORA GALI, MURREE
- ❖ ARMY BURN HALL COLLEGE, ABBOTTABAD & GIRLS CADET COLLEGES
- ❖ ATICHESON COLLEGE, LAHORE

By:

**Engr. Khawar Mahmood**

Principal: Foundation Pre-Cadet School & Academy, Islamabad

Published by



Academic Solutions & Assessment Network  
Lahore – Islamabad – Quetta

**1. Mathematics**

**2. General Science**

# Asan Model Paper 1

## (Domain 1 — Numbers and Operations)

### Section A – MCQ's (10 marks)

Choose the correct option.

- The number that can be expressed in the form of  $\frac{p}{q}$ ,  $q \neq 0$  is called:
  - mixed number
  - rational number
  - whole number
  - natural number
- The set of rational number is denoted by:
  - W
  - Q
  - N
  - Q'
- $\frac{1}{3}(18)(-6) = \underline{\hspace{2cm}}$ .
  - 36
  - 36
  - 18
  - 18
- $\frac{-(17-17)}{20} = \underline{\hspace{2cm}}$ .
  - $\frac{-34}{20}$
  - 0
  - $\frac{-1}{20}$
  - $\frac{1}{20}$
- $\frac{-5}{6} + \frac{3}{7} = \frac{3}{7} + \boxed{?}$ 
  - $\frac{1}{2}$
  - $\frac{6}{7}$
  - $\frac{5}{6}$
  - $\frac{-5}{6}$
- The difference between the actual value and estimated value is called:
  - error
  - approximation
  - rounding
  - reasonableness
- Who introduced BODMAS:
  - Achilles Reselfelt
  - Al-Khawarizmi
  - John
  - William
- In BODMAS rule, "of" stands for:
  - addition
  - subtraction
  - division
  - multiplication
- The set is written in the bracket.
  - ( )
  - { }
  - [ ]
  - [ }
- To write an empty set, we use the symbol:
  - $\subset$
  - $\phi$
  - $\cap$
  - $\{\phi\}$

Ans.

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

### Section B – Fill in the blanks (10 marks)

- Fill in the blanks with appropriate mathematical statement. (10 marks)
  - In ascending order  $\frac{4}{5}, \frac{7}{30}, \frac{7}{15}, \frac{3}{10} = \underline{\hspace{2cm}}$ .  
 Ans.  $\left(\frac{7}{30}, \frac{3}{10}, \frac{7}{15}, \frac{4}{5}\right)$
  - In descending order  $\frac{5}{8}, \frac{13}{24}, \frac{7}{12}, \frac{9}{48} = \underline{\hspace{2cm}}$ .  
 Ans.  $\left(\frac{5}{8} > \frac{13}{24} > \frac{9}{48} > \frac{7}{12}\right)$
  - $-4\frac{2}{5} \div \left(\frac{-6}{5}\right) = \underline{\hspace{2cm}}$ .  
 Ans.  $\left(3\frac{2}{3}\right)$
  - The product of two rational number is  $-\frac{1}{10}$ . If one number is  $\frac{-3}{5}$ , the other will be  $\underline{\hspace{2cm}}$ .  
 Ans.  $\left(\frac{1}{6}\right)$
  - $70 + [10 + 20 - 2(8 - 2 + 3)] = \underline{\hspace{2cm}}$ .  
 Ans. (82)
  - If  $z = \{1, 3, 5, 7\}$  and  $y = \{1, 2, 3, 4, 5\}$ , then  $z - y = \underline{\hspace{2cm}}$ .  
 Ans.  $\{7\}$
  - $(A \cap B)^C = \underline{\hspace{2cm}}$ .  
 Ans.  $(A^C \cup B^C)$
  - Product of two number is  $\frac{77}{56}$ . If first number is  $\frac{13}{8}$ , then the other number is  $\underline{\hspace{2cm}}$ .  
 Ans.  $\left(\frac{11}{13}\right)$
  - $\frac{7}{10}, \frac{-3}{5}, \frac{-7}{10}, \frac{13}{15}$ . In ascending order, it is  $\underline{\hspace{2cm}}$ .  
 Ans.  $\left(\frac{-7}{10}, \frac{-3}{5}, \frac{7}{10}, \frac{13}{15}\right)$

(x) If  $U = \{0, 1, 2, 3, \dots, 10\}$ ,  $X = \{0, 3, 6, 9\}$ ,  
then  $X' =$  \_\_\_\_\_.

Ans.  $\{1, 2, 4, 5, 7, 8, 10\}$

**Section C – Subjective (80 marks)**

Q.1(a) The sum of two rational numbers is  $-\frac{3}{5}$ .

If one of them is  $\frac{9}{10}$ , find the other.

Ans. Sum of the numbers  $= -\frac{3}{5}$ ;

One of the number  $= \frac{9}{10}$

The other number = Sum of numbers – one of the number

$$\begin{aligned} &= -\frac{3}{5} - \frac{9}{10} \\ &= \frac{-3 \times 2 - 9 \times 1}{10} \\ &= \frac{-6 - 9}{10} = -\frac{15}{10} \end{aligned}$$

Hence, the other number is  $-\frac{15}{10}$ .

(b) Solve:  $\frac{2}{5} \times \left(\frac{-3}{4}\right) \times \left(\frac{-9}{5}\right)$

$$\begin{aligned} \text{Ans. } \frac{2}{5} \times \left(\frac{-3}{4}\right) \times \left(\frac{-9}{5}\right) &= \frac{2 \times (-3) \times (-9)}{5 \times 4 \times 5} \\ &= \frac{2 \times 27}{100} \\ &= \frac{54}{100} = \frac{27}{50} \end{aligned}$$

Noor and Nazia planted their plants. The height of Noor's plant was  $\frac{15}{4}$  cm while height of Nazia's plant was  $\frac{7}{5}$  times of Noor's plant. Find the height of Nazia's plant.

Ans. To find the height of Nazia's plant, we will have to multiply  $\frac{7}{5}$  by  $\frac{15}{4}$ .

$$\text{Height of Nazia's plant} = \frac{7}{5} \times \frac{15}{4} = \frac{21}{4}$$

So, the height of Nazia's plant was  $\frac{21}{4}$  cm.

(d) Solve:  $-4\frac{2}{5} + \left(\frac{-6}{5}\right)$

$$\begin{aligned} \text{Ans. } -4\frac{2}{5} + \left(\frac{-6}{5}\right) &= -\frac{22}{5} + \left(\frac{-6}{5}\right) \\ &= \frac{(-22) \times (-5)}{5 \times 6} \\ &= \frac{22 \times 1}{1 \times 3} = \frac{11}{3} = 3\frac{2}{3} \end{aligned}$$

Q.2 If  $\frac{75}{4}$  kilogram rice is to be packed in  $\frac{25}{8}$  kilogram packets, then find:

- How many packets of rice will be packed?
- How much rice will be there in 20 packets of mass  $\frac{24}{15}$  kilograms each?

Ans. Total rice  $= \frac{75}{4}$  kg

One packet  $= \frac{25}{8}$  kg

$$\begin{aligned} \text{(i) Number of packets} &= \frac{\text{Total rice}}{\text{One packet}} \\ &= \frac{75}{4} \div \frac{25}{8} \\ &= \frac{75^3}{4_1} \times \frac{8^2}{25_1} = 6 \text{ packets} \end{aligned}$$

(ii) If no. of packets = 20

Mass of one packet  $= \frac{24}{15}$  kg

$$\text{Total quantity of rice} = 20^4 \times \frac{24^8}{15_1} = 32 \text{ kg}$$

(b) Zara bought  $\frac{235}{7}$  litres cooking oil. She used  $\frac{2}{14}$  litres oil for cooking. How much oil was left with her?

Ans. Total oil bought  $= \frac{235}{7}$  litres

Oil used  $= \frac{2}{14}$  litres

$$\begin{aligned} \text{Oil left} &= \frac{235}{7} - \frac{2}{14} \\ &= \frac{470 - 2}{14} \\ &= \frac{468}{14} = \frac{234}{7} \text{ litres} \end{aligned}$$

$$Q.3(a) \left( \frac{15}{20} + \frac{-5}{10} \right) + \frac{12}{40} = \frac{15}{20} + \left( \frac{-5}{10} + \frac{12}{40} \right)$$

$$\text{Ans. } \left( \frac{15-10}{20} \right) + \frac{12}{40} = \frac{15}{20} + \left( \frac{-20+12}{40} \right)$$

$$\frac{5}{20} + \frac{12}{40} = \frac{15}{20} - \frac{8}{40}$$

$$\frac{10+12}{40} = \frac{30-8}{40}$$

$$\frac{22}{40} = \frac{22}{40}$$

$$\frac{11}{20} = \frac{11}{20}$$

L.H.S. = R.H.S.

$$(b) \left( \frac{-5}{10} + \frac{10}{-20} \right) + \frac{15}{30} = \frac{-5}{10} + \left( \frac{10}{-20} + \frac{15}{30} \right)$$

$$\text{Ans. } \left( \frac{-10-10}{20} \right) + \frac{15}{30} = \frac{-5}{10} + \left( \frac{-30+30}{60} \right)$$

$$\frac{-20}{20} + \frac{15}{30} = \frac{-5}{10} + \frac{0}{60}$$

$$\frac{-60+30}{60} = \frac{-5}{10}$$

$$\frac{-30}{60} = \frac{-1}{2}$$

$$-\frac{1}{2} = -\frac{1}{2}$$

L.H.S. = R.H.S.

**Q.4(a) Simplify:**

$$18 + 2 - \{3 \times 5 - \{12 - 6 - (-6 + 8 - 5)\}\}$$

**Ans.**

$$18 + 2 - \{3 \times 5 - \{12 - 6 - (-6 + 8 - 5)\}\}$$

$$= 18 + 2 - \{3 \times 5 - \{12 - 6 - (-6 + 8 - 5)\}\}$$

solved bar or vinculum

$$= 18 + 2 - \{3 \times 5 - \{12 - 6 - (-3)\}\}$$

$$= 18 + 2 - \{3 \times 5 - \{12 - 6 + 3\}\}$$

solved round brackets

$$= 18 + 2 - \{3 \times 5 - \{9\}\}$$

$$= 18 + 2 - \{3 \times 5 - 9\}$$

solved curly brackets

$$= 18 + 2 - \{15 - 9\}$$

applied BODMAS rule

$$= 18 + 2 - 6$$

solved box brackets

$$= 9 - 6$$

applied BODMAS rule

$$= 3$$

**(b) Simplify:**

$$2.25 + 8.5 \times [2 \times 1.37 + \{3.2 - (5.2 - \overline{3.2 + 5.2})\}]$$

**Ans.**

$$2.25 + 8.5 \times [2 \times 1.37 + \{3.2 - (5.2 - \overline{3.2 + 5.2})\}]$$

$$= 2.25 + 8.5 \times [2 \times 1.37 + \{3.2 - (5.2 - 3.2 - 5.2)\}]$$

solved bar

$$= 2.25 + 8.5 \times [2 \times 1.37 + \{3.2 - (-3.2)\}]$$

$$= 2.25 + 8.5 \times [2 \times 1.37 + \{3.2 + 3.2\}]$$

solved round brackets

$$= 2.25 + 8.5 \times [2 \times 1.37 + 6.4]$$

$$= 2.25 + 8.5 \times [2.74 + 6.4]$$

$$= 2.25 + 8.5 \times 9.14$$

solved square brackets

$$= 0.265 \times 9.14$$

$$= 2.4221$$

**Q.5 Simplify:**

$$2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} - \left( \frac{1}{2} - \overline{\frac{1}{3} + \frac{1}{5}} \right) \right\} \right]$$

$$\text{Ans. } 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} - \left( \frac{1}{2} - \overline{\frac{1}{3} + \frac{1}{5}} \right) \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} - \left( \frac{1}{2} - \frac{1}{3} - \frac{1}{5} \right) \right\} \right]$$

solved bar or vinculum

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} - \left( \frac{15-10-6}{30} \right) \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} - \left( \frac{1}{30} \right) \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times 5\frac{1}{2} + \frac{1}{30} \right\} \right]$$

solved round brackets

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 2 \times \frac{11}{2} + \frac{1}{30} \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ 11 + \frac{1}{30} \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ \frac{330+1}{30} \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \left\{ \frac{331}{30} \right\} \right]$$

$$= 2\frac{1}{3} + \left[ 1\frac{1}{3} - 2\frac{1}{5} - \frac{331}{30} \right]$$

solved curly brackets

$$= 2\frac{1}{3} + \left[ \frac{4}{3} - \frac{11}{5} - \frac{331}{30} \right]$$

$$= 2\frac{1}{3} + \left[ \frac{40-66-331}{30} \right]$$

$$= 2\frac{1}{3} + \left[ \frac{-357}{30} \right]$$

$$= 2\frac{1}{3} \times \frac{-30}{357}$$

solved square brackets

$$= \frac{7^1}{3^1} \times \frac{-30^{10}}{357^{51}}$$

$$= \frac{-10}{51}$$

Q.6(a)  $\left[ 3\frac{2}{3} + \left\{ 1\frac{1}{3} + \left( 1\frac{2}{3} + 3\frac{2}{5} - 2\frac{1}{5} \right) \right\} \times 2\frac{3}{5} \right]$

Ans.  $\left[ 3\frac{2}{3} + \left\{ 1\frac{1}{3} + \left( 1\frac{2}{3} + 3\frac{2}{5} - 2\frac{1}{5} \right) \right\} \times 2\frac{3}{5} \right]$

$$= \left[ \frac{11}{3} + \left\{ \frac{4}{3} + \left( \frac{5}{3} + \frac{17}{5} - \frac{11}{5} \right) \right\} \times \frac{13}{5} \right]$$

$$= \left[ \frac{11}{3} + \left\{ \frac{4}{3} + \left( \frac{25+51-33}{15} \right) \right\} \times \frac{13}{5} \right]$$

$$= \left[ \frac{11}{3} + \left\{ \frac{4}{3} + \frac{43}{15} \right\} \times \frac{13}{5} \right]$$

$$= \left[ \frac{11}{3} + \left\{ \frac{20+43}{15} \right\} \times \frac{13}{5} \right]$$

$$= \frac{11}{3} + \frac{63}{15} \times \frac{13}{5} = \frac{11}{3} + \frac{15}{63} \times \frac{13}{5}$$

$$= \frac{11 \times 15^5 \times 13}{3 \times 63 \times 5} = \frac{143}{63} = 2\frac{17}{63}$$

(b)  $[3 + \{1.25 \times 3.85 \div (5.64 - 2.7 + 1.4)\}]$

Ans.  $[3 + \{1.25 \times 3.85 \div (5.64 - 2.7 + 1.4)\}]$

$$= [3 + 1.25 \times 3.85 \div (5.64 - 2.7 - 1.4)]$$

$$= [3 + 1.25 \times 3.85 \div 1.54]$$

$$= [3 + 1.25 \times 2.5]$$

$$= [3 + 3.125] = 6.125$$

Q.7(a)  $0.8 \times [4.9 \times \{0.555 \div (0.2 + 0.02 + 0.002)\}]$

Ans.  $0.8 \times [4.9 \times \{0.555 \div (0.2 + 0.02 + 0.002)\}]$

$$= 0.8 \times [4.9 \times \{0.555 \div 0.222\}]$$

$$= 0.8 \times [4.9 \times 2.5]$$

$$= 0.8 \times 12.25 = 9.8$$

(b)  $5.2383 + [1.026 + \{1.123 \times (9.261 + 2.345 + 5.432)\}] \times 2.03$

Ans.

$$= 5.2383 + [1.026 + \{1.123 \times (3.949 + 5.432)\}] \times 2.03$$

$$= 5.2383 + [1.026 + \{1.123 \times 9.381\}] \times 2.03$$

$$= 5.2383 + [1.026 + 10.5348] \times 2.03$$

$$= 5.2383 + 11.561 \times 2.03$$

$$= 0.4531 \times 2.03 = 0.9198$$

Q.8 If  $U = \{1, 2, 3, \dots, 10\}$ ,  $A = \{2, 4, 6, 8, 10\}$  and  $B = \{1, 2, 3, 6, 7, 8, 9\}$ , then verify the following properties:

(i)  $A \cup A^C = U$

(ii)  $A \cap A^C = \phi$

(iii)  $(A \cup B)^C = A^C \cap B^C$

(iv)  $(A \cap B)^C = A^C \cup B^C$

Ans.  $U = \{1, 2, 3, \dots, 10\}$ ,  $A = \{2, 4, 6, 8, 10\}$

and  $B = \{1, 2, 3, 6, 7, 8, 9\}$

First, we find  $A^C$  and  $B^C$

$$A^C = U - A$$

$$A^C = \{1, 2, 3, \dots, 10\} - \{2, 4, 6, 8, 10\}$$

$$= \{1, 3, 5, 7, 9\}$$

$$B^C = U - B$$

$$B^C = \{1, 2, 3, \dots, 10\} - \{1, 2, 3, 6, 7, 8\}$$

$$= \{4, 5, 9, 10\}$$

(i)  $A \cup A^C = U$

$$\text{L.H.S.} = A \cup A^C$$

$$= \{2, 4, 6, 8, 10\} \cup \{1, 3, 5, 7, 9\}$$

$$= \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$= \{1, 2, 3, \dots, 10\} = U = \text{R.H.S.}$$

Hence, L.H.S. = R.H.S.

(ii)  $A \cap A^C = \phi$

$$\text{L.H.S.} = A \cap A^C$$

$$= \{2, 4, 6, 8, 10\} \cap \{1, 3, 5, 7, 9\}$$

$$= \{ \} \text{ or } \phi = \text{R.H.S.}$$

Hence, L.H.S. = R.H.S.

(iii)  $(A \cup B)^C = A^C \cap B^C$

$$\text{L.H.S.} = (A \cup B)^C$$

$$= (\{2, 4, 6, 8, 10\} \cup \{1, 2, 3, 6, 7, 8\})^C$$

$$= (\{1, 2, 3, 4, 6, 7, 8, 10\})^C$$

$$= U - \{1, 2, 3, 4, 6, 7, 8, 10\}$$

$$= \{1, 2, 3, \dots, 10\} - \{1, 2, 3, 4, 6, 7, 8, 10\}$$

$$= \{5, 9\}$$

$$\text{R.H.S.} = A^C \cap B^C$$

$$= \{1, 3, 5, 7, 9\} \cap \{4, 5, 9, 10\}$$

$$= \{5, 9\}$$

Hence, L.H.S. = R.H.S.

(iv)  $(A \cap B)^C = A^C \cup B^C$

$$\text{L.H.S.} = (A \cap B)^C$$

$$= (\{2, 4, 6, 8, 10\} \cap \{1, 2, 3, 6, 7, 8, 9\})^C$$

$$\begin{aligned}
 &= \{2, 6, 8\}^C \\
 &= U - \{2, 6, 8\} \\
 &= \{1, 2, 3, \dots, 10\} - \{2, 6, 8\} \\
 &= \{1, 3, 4, 5, 7, 9, 10\}
 \end{aligned}$$

$$\begin{aligned}
 \text{R.H.S.} &= A^C \cup B^C \\
 &= \{1, 3, 5, 7, 9\} \cup \{4, 5, 9, 10\} \\
 &= \{1, 3, 4, 5, 7, 9, 10\}
 \end{aligned}$$

Hence, L.H.S. = R.H.S.

$$Q.9 \quad \frac{-1}{5} \times \left( \frac{5}{9} + \frac{7}{18} \right) = \left( \frac{-1}{5} \times \frac{5}{9} \right) + \left( \frac{-1}{5} \times \frac{7}{18} \right)$$

$$\text{Ans.} \quad \frac{-1}{5} \times \left( \frac{5}{9} + \frac{7}{18} \right) = \left( \frac{-1}{5} \times \frac{5}{9} \right) + \left( \frac{-1}{5} \times \frac{7}{18} \right)$$

$$\frac{-1}{5} \times \left( \frac{10+7}{18} \right) = \frac{-1}{5} \times \frac{17}{18} + \left( \frac{-7}{90} \right)$$

$$\frac{-1}{5} \times \frac{17}{18} = \frac{-17}{90} - \frac{7}{90}$$

$$\frac{-17}{90} = \frac{-10-7}{90}$$

$$\frac{-17}{90} = \frac{-17}{90}$$

L.H.S. = R.H.S.

Q.10 Compare your approximated value and accurate value. Also check is the solution reasonable?

10.59 – 7.24 (2 decimal places)

Ans. Actual value = 3.35

Approximated value = 1059 – 7.24  
= 3.35

No error

It is reasonable solution so  $\Rightarrow$  3.35

## Asan Model Paper 2

### Section A – MCQ's (10 marks)

Choose the correct option.

- The ratio of 2 years to 6 months.  
(a) 1 : 4 (b) 2 : 6  
(c) 4 : 1 (d) 1 : 3
- The comparison of two quantities with same kinds is known as:  
(a) rate (b) ratio  
(c) average rate (d) proportion
- The value of  $m$  in the given proportion:  
 $6 : m :: 5 : 10$   
(a) 12 (b) 30  
(c) 25 (d) 15
- The equality of two ratio is known as:  
(a) ratio (b) increase ratio  
(c) rate (d) proportion
- In proportion, product of means and product of extremes are:  
(a) less (b) equal  
(c) greater (d) not equal
- If the cost price is Rs. 450 and selling price is Rs. 550 then Profit will be:  
(a) 50 (b) 100  
(c) 150 (d) 200
- If the marked price is Rs. 780 and selling price is Rs. 750 then discount will be:  
(a) 10 (b) 20  
(c) 30 (d) 40
- The tax imposed on the income of an individual is called \_\_\_\_\_.  
(a) GST (b) VAT  
(c) income tax (d) property tax
- Rate of Zakat is \_\_\_\_\_.  
(a) 1% (b) 1.5%  
(c) 2.5% (d) 3%
- Rate of ushr on a land irrigated by natural sources is \_\_\_\_\_.  
(a) 5% (b) 10%  
(c) 15% (d) 20%

Ans.

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

**Section B – Fill in the Blanks (10 marks)**

1. 4km to 800m, in ratio form is \_\_\_\_\_.

Ans. 5:1

2. Increase 15 in the ratio of 8:5 = \_\_\_\_\_.

Ans. 24

3. Decrease 999 in the ratio of 2:9 = \_\_\_\_\_.

Ans. 222

4. Area of square \_\_\_\_\_ if length of one side = 33.

Ans.  $1089\text{m}^2$

5.  $\sqrt{0.0441} = \underline{\hspace{2cm}}$ .

Ans. 0.21

6. Cost of 20kg apples is Rs. 4000, then cost of 25kg apples is \_\_\_\_\_.

Ans. Rs. 5000

7. If Hamza covers 225km in 3 hours, in 8 hours, he will cover \_\_\_\_\_.

Ans. 600km

Cost of 15 pens is = Rs. 150, then cost of 20 pens is \_\_\_\_\_.

Ans. Rs. 200

9.  $\sqrt{\frac{256}{1089}} = \underline{\hspace{2cm}}$ .

Ans.  $\left(\frac{16}{33}\right)$

10. If Sadia paid zakat of Rs. 15000 on gold, then total price of gold is \_\_\_\_\_.

Ans. Rs. 600000

**Section C – Subjective (80 Marks)**

Q.1 If  $U = \{21, 22, 23, 24, \dots, 40\}$ ,

$A = \{1, 23, 24, 26, 27\}$  and

$B = \{25, 26, 27, 28, 29, 30, 35, 36\}$

then verify the following:

(i)  $A \cup A^C = U$

(ii)  $A \cap A^C = \phi$

(iii)  $B \cup B^C = U$

(iv)  $B \cap B^C = \phi$

Ans.  $U = \{21, 22, 23, 24, \dots, 40\}$

$A = \{21, 23, 24, 26, 27\}$

$B = \{25, 26, 27, 28, 29, 30, 35, 36\}$

Verify the following

(i)  $A \cup A^C = U$

$$A^C = U - A$$

$$A^C = \{21, 22, 23, 24, \dots, 40\} - \{21, 23, 24, 26, 27\}$$

$$A^C = \{22, 25, 28, 29, 30, 31, \dots, 40\}$$

$$A \cup A^C = \{21, 23, 24, 26, 27\} \cup \{22, 25, 28, 29, 30, \dots, 40\}$$

$$= \{21, 22, 23, 24, 25, 26, \dots, 40\} \quad \text{L.H.S.}$$

$$U = \{21, 22, 23, 24, \dots, 40\} \quad \text{R.H.S.}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$A \cup A^C = U \quad \text{Proved}$$

(ii)  $A \cap A^C = \phi$

$$A \cap A^C = \{21, 23, 24, 26, 27\} \cap \{22, 25, 28, 29, \dots, 40\}$$

$$A \cap A^C = \phi \quad \text{L.H.S.}$$

$$\phi = \phi \quad \text{R.H.S.}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$A \cap A^C = \phi \quad \text{Proved}$$

(iii)  $B \cup B^C = U$

$$B^C = U - B$$

$$= \{21, 22, 23, \dots, 40\} - \{25, 26, 27, 28, 29, 30, 35, 36\}$$

$$= \{21, 22, 23, 24, 31, 32, 33, 34, 37, 38, 39, 40\}$$

$$B \cup B^C = \{25, 26, 27, 28, 29, 30, 35, 36\}$$

$$\cup \{21, 22, 23, 24, 31, 32, 33, 34, 37, 38, 39, 40\}$$

$$= \{21, 22, 23, 24, \dots, 40\} \quad \text{L.H.S.}$$

$$U = \{21, 22, 23, 24, \dots, 40\} \quad \text{R.H.S.}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$B \cup B^C = U \quad \text{Proved}$$

(iv)  $B \cap B^C = \phi$

$$B \cap B^C = \{25, 26, 27, 28, 29, 30, 35, 36\} \cap$$

$$\{21, 22, 23, 24, 31, 32, 33, 34, 37, 38, 39, 40\}$$

$$B \cap B^C = \phi \quad \text{L.H.S.}$$

$$\phi = \phi \quad \text{R.H.S.}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$B \cap B^C = \phi \quad \text{Proved}$$

Q.2 Verify  $(A \cup B)^C - (A^C \cap B^C) = \phi$  and

$$(A \cap B)^C - (A^C \cup B^C) = \phi \text{ where}$$

$$U = \{0, 1, 2, 3, 4, 5, \dots, 18\}$$

(i)  $A = \{2, 4, 6, 7, 12, 14, 15, 17\};$

$$B = \{3, 9, 13, 16, 18\}$$

(ii)  $A = \{1, 2, 3, 4, 5, 10, 12, 14\};$

$$B = \{5, 10, 15\}$$

Ans. Verify:

(a)  $(A \cup B)^C - (A^C \cap B^C) = \phi$

(b)  $(A \cap B)^C - (A^C \cup B^C) = \phi$

$$\begin{aligned} \text{(i)(a)} \quad U &= \{0, 1, 2, 3, 4, 5, \dots, 18\} \\ A &= \{2, 4, 6, 7, 12, 14, 15, 17\} \\ B &= \{3, 9, 13, 16, 18\} \\ A \cup B &= \{2, 3, 4, 6, 7, 9, 12, 13, 14, 15, 16, 17, 18\} \end{aligned}$$

$$\begin{aligned} (A \cup B)^C &= U - (A \cup B) \\ &= \{0, 1, 2, 3, \dots, 18\} - \\ &\quad \{2, 3, 4, 6, 7, 9, 12, 13, 14, 15, 16, 17, 18\} \\ &= \{0, 1, 5, 8, 10, 11\} \quad \text{L.H.S.} \end{aligned}$$

$$\begin{aligned} A^C &= U - A = \{0, 1, 3, 5, 8, 9, 10, 11, 13, 16\} \\ B^C &= U - B = \{0, 1, 2, 4, 5, 6, 7, 8, 10, 11, 12, 14, 15, 17\} \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$(A \cap B)^C - (A^C \cup B^C) = \phi \quad \text{Proved}$$

$$\begin{aligned} \text{(ii)(b)} \quad A \cap B &= \{2, 4, 6, 7, 12, 14, 15, 17\} \cap \{3, 9, 13, 16, 18\} \\ &= \phi \\ (A \cap B)^C &= U - \phi = U \end{aligned}$$

$$\begin{aligned} A^C &= U - A \\ &= \{0, 1, 2, 3, \dots, 18\} - \{2, 4, 6, 7, 12, 14, 15, 17\} \\ &= \{0, 1, 3, 5, 8, 9, 10, 11, 13, 16, 18\} \end{aligned}$$

$$\begin{aligned} B^C &= U - B \\ &= \{0, 1, 2, 3, \dots, 18\} - \{3, 9, 13, 16, 18\} \\ &= \{0, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17\} \end{aligned}$$

$$A^C \cup B^C = \{0, 1, 2, 3, 4, 5, \dots, 18\} = U$$

$$\begin{aligned} (A \cap B)^C - (A^C \cup B^C) &= ? \\ &= U - U = \phi \quad \text{Proved} \end{aligned}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$\begin{aligned} \text{(ii)} \quad U &= \{0, 1, 2, 3, 4, 5, \dots, 18\} \\ A &= \{1, 2, 3, 4, 5, 10, 12, 14\} \\ B &= \{5, 10, 15\} \end{aligned}$$

Verify that (a)

$$(A \cup B)^C - (A^C \cap B^C) = \phi$$

$$\begin{aligned} A \cup B &= \{1, 2, 3, 4, 5, 10, 12, 14\} \cup \{5, 10, 15\} \\ &= \{1, 2, 3, 4, 5, 10, 12, 14, 15\} \end{aligned}$$

$$\begin{aligned} (A \cup B)^C &= U - (A \cup B) \\ &= \{0, 1, 2, 3, \dots, 18\} - \{1, 2, 3, 4, 5, 10, 12, 14, 15\} \\ &= \{0, 6, 7, 8, 9, 11, 13, 16, 17, 18\} \quad \text{(i)} \end{aligned}$$

$$\begin{aligned} A^C &= U - A \\ &= \{0, 1, 2, 3, 4, 5, \dots, 18\} - \{1, 2, 3, 4, 5, 10, 12, 14\} \\ &= \{0, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18\} \end{aligned}$$

$$\begin{aligned} B^C &= U - B \\ &= \{0, 1, 2, 3, \dots, 18\} - \{5, 10, 15\} \\ &= \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18\} \end{aligned}$$

$$A^C \cap B^C = \{0, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18\} \cap$$

$$\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18\}$$

$$= \{0, 6, 7, 8, 9, 11, 13, 16, 17, 18\} \quad \text{(ii)}$$

$$\begin{aligned} (A \cup B)^C - A^C \cap B^C &= \{0, 6, 7, 8, 9, 11, 13, 16, 17, 18\} - \\ &\quad \{0, 6, 7, 8, 9, 11, 13, 16, 17, 18\} \\ &= \phi \quad \text{Proved} \end{aligned}$$

Verify that (b)

$$(A \cap B)^C - (A^C \cup B^C) = \phi$$

$$\begin{aligned} A \cap B &= \{1, 2, 3, 4, 5, 10, 12, 14\} \cap \{5, 10, 15\} \\ &= \{5, 10\} \end{aligned}$$

$$\begin{aligned} (A \cap B)^C &= U - \{A \cap B\} \\ &= \{0, 1, 2, 3, \dots, 18\} - \{5, 10\} \\ &= \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18\} \end{aligned}$$

$$\begin{aligned} A^C \cup B^C &= \{0, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18\} \cup \\ &\quad \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18\} \\ &= \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18\} \end{aligned}$$

$$\begin{aligned} (A \cap B)^C - (A^C \cup B^C) &= ? \\ &= \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18\} - \\ &\quad \{0, 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18\} \\ &= \phi \end{aligned}$$

$$= \phi$$

$$\text{So } (A \cap B)^C - (A^C \cup B^C) = \phi \quad \text{Proved}$$

**Q.3(a)** If the height of Umer is increased from 40 inches to 65 inches in 13 years, then find the ratio of increased height.

$$\begin{aligned} \text{Ans. The required ratio} &= \text{New height} : \text{Old height} \\ &= 65 : 40 \\ &= 13 : 8 \end{aligned}$$

Thus, the height of Umer increased in the ratio of 13 : 8.

**(b)** If the price of wheat is decreased from Rs. 180 to 150, then find the ratio of decreased price.

**Ans.** The required ratio can be calculated by this method.



$$\begin{aligned} \text{The required ratio} &= \text{New value} : \text{Old value} \\ &= 150 : 180 \\ &= 5 : 6 \end{aligned}$$

Thus, price of wheat decrease in the ratio of 5 : 6.

**Q.4(a)** A bus is to cover 630km. It covers first 180km of the journey at speed of 60 km/h and covers next 450km at speed of 90 km/h. What is its average speed?

**Ans.**

For first 180km

As, we know that:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$60 = \frac{180}{\text{Time}}$$

$$\text{Time} = \frac{180}{60}$$

$$\text{Time} = 3 \text{ hours}$$

For next 450km

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$90 = \frac{450}{\text{Time}}$$

$$\text{Time} = \frac{450}{90}$$

$$\text{Time} = 5 \text{ hours}$$



Total distance covered by the bus = 630km

Total time taken by the bus = 3 + 5 = 8 hours

$$\text{Average speed} = \frac{\text{Total distance covered}}{\text{Total time taken}}$$

$$= \frac{630\text{km}}{8 \text{ hours}}$$

$$= 78.75\text{km/h}$$

Hence, the average speed of the bus is 78.75km/h.

(b) A train is to cover 1180km. If it covers first 550km at the speed of 100 km/hour and the remaining distance at the speed of 90 km/hour. Find the average speed of the train.

**Ans.** Total distance = 1180km

First 550km speed = 100km/hr

$$\text{Time} = \frac{550}{100} = 5.5 \text{ hours}$$

Remaining distance = 1180 - 550 = 630km

New speed = 90 km/hr

$$\text{New time} = \frac{630}{90} = 7 \text{ hours}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{1180}{5.5 + 7}$$

$$= \frac{1180}{12.5}$$

$$= 94.4 \text{ km/hour}$$

(a) If 1 person takes 7 days to clean a house from bugs, how many days will take 7 people take to clean the house from bugs?

**Ans.** Person Days

$$\begin{array}{cc} \uparrow 1 & 7 \uparrow \\ 7 & x \end{array}$$

$$x : 7 :: 1 : 7$$

$$7x = 7 \times 1$$

$$x = \frac{7 \times 1}{7} = 1 \text{ day}$$

(b) The marked price of an electric heater is Rs. 4800. A discount of 15% is announced on sale. What is the amount of discount and its selling price?

**Ans.** Marked price of an electric heater = Rs. 4800

Discount = 15% of Rs. 4800

$$= \frac{15}{100} \times 4800 = \text{Rs. } 720$$

Selling price of the electric heater

= Marked price - Discount amount

$$= 4800 - 720 = \text{Rs. } 4080$$

Hence, the amount of discount is Rs. 720 and its selling price is Rs. 4080.



Q.6(a) Eman purchases a heater for Rs. 4600 and sells it for Rs. 4500. She buys an oven for Rs. 14500 and sells it for Rs. 14000. On which item does Eman bear less loss?

**Ans.** CP1 heater = 4600

SP1 = 4500

Loss1 = 100

$$\text{Loss1\%} = \frac{100 \times 100}{4600} = \frac{100}{46}$$

Loss1% on heater = 2.17%

CP2 oven = 14500

SP2 = 14000

Loss2 = 500

$$\text{Loss \% on oven} = \frac{500 \times 100}{14500}$$

$$= \frac{500}{145} = \frac{100}{29}$$

$$= 3.45\%$$

She bears less loss on heater.

(b) The marked price of a computer table is Rs. 6700. It is sold at a discount of 12%. Find the selling price of the computer table.

**Ans.** Marked price = Rs. 6700

Discount = 12%

SP = ?

If marked price 100, then SP = 88

If marked price 1, then  $SP = \frac{88}{100}$

If marked price 6700, then  $SP = \frac{88 \times 6700}{100}$   
 $= 88 \times 67$   
 $= \text{Rs. } 5896$

**Q. 7(a)** Hina has jewelry of 11 tola gold. Find the amount of zakat on it if the value of 1 tola of gold is Rs. 130000.

**Ans.** Gold = 11 tola

Cost of gold =  $11 \times 130000$   
 $= 1430000$

Zakat rate = 2.5%

Amount of zakat =  $\frac{2.5}{100} \times 1430000$

$$= \frac{25 \times 1430000}{1000}$$

$$= 25 \times 1430 = \text{Rs. } 35750$$

**(b)** Ahsan has a crop wheat of worth Rs. 400000 irrigated by natural sources. Find the amount of ushr on it.

**Ans.** Worth = Rs. 400000

Ushr rate = 10%

Ushr amount =  $\frac{10 \times 400000}{100}$

$$= 10 \times 4000 = 40,000$$

**Q. 8(a)** A fort had enough food for 60 soldiers for 40 days. How long would the food last if 30 more soldiers join after 16 days?

**Ans.** Soldiers      Food (days)  
                     60                      40

After 16 days

The food is sufficient for 60

Soldiers for  $(40 - 16)$  days = 24 days

After 16 days;

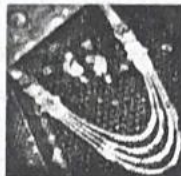
No. of soldiers =  $60 + 30 = 90$  soldiers

Soldiers : Food (days)

↑ 60 : ↓ 24  
 ↑ 90 : ↓ x

$$\frac{24}{x} = \frac{90}{60}$$

$$x = \frac{60 \times 24}{90} = 16 \text{ days}$$



**(b)** The price of a washing machine is Rs. 80000. If the rate of GST is 17%, then find the total price of washing machine including GST.

**Ans.** Price of washing machine = Rs. 80,000

GST = 17%

Total price = Original price + GST

$$= 80000 + \frac{17}{100} \times 80,000$$

$$= 80000 + 13600$$

Total cost price = Rs. 93600

### Test Your Memory

**Q.1** Mohsin took 5 days to finish a book, reading 100 pages daily. How many pages must he read in a day to finish it in 10 days?

**Ans.** Total pages = 500 pages

To finish in 10 days

$$\frac{500}{10} = 50 \text{ pages/day}$$

**Q.2** If 42 men can reap a field in 16 days, in how many days can 20 men reap the same field?

**Ans.** Man : Day

↑ 42                      ↓ 16  
 ↑ 20                      ↓ x

$$\frac{16}{x} = \frac{20}{42}$$

$$20x = 16 \times 42$$

$$x = \frac{16 \times 42}{20} = 33.6 \text{ days}$$

**Q.3** An international phone call costs Rs. 10 for 4 minutes. Find the unit rate in rupees/minute.

**Ans.** Cost =  $\frac{10}{4} = \frac{5}{2} = 2.5 \text{ Rs./min}$

**Q.4** Hassan reads 18 pages in 9 minutes. Find the unit rate in pages/minute.

**Ans.** Number of pages = 18

Time taken = 9 minutes

$$\text{Unit rate} = \frac{18}{9} = 2 \text{ pages/minute}$$

**Q.5** A car consumes 10 litres of fuel for a distance of 260km. Find the unit rate in km/litre.

**Ans.** Unit rate =  $\frac{260}{10} \text{ km} = 26 \text{ km/litres}$

**Q.8(a)** If three cylinders of radius 5cm and height 20cm are joined together end to end. Then find the total surface area and volume of resulting cylinder.

**Ans.** Radius of cylinder = 5cm

Height = 20cm

Volume =  $\pi r^2 h$

$$= \frac{22}{7} \times 5 \times 5 \times 20$$

$$= \frac{11000}{7} = 1571.43 \text{ cm}^3$$

$$\begin{aligned} \text{Volume of 3 cylinders} &= 1571.43 \times 3 \\ &= 4714.29 \text{ cm}^3 \end{aligned}$$

Height of single cylinder =  $20 \times 3 = 60 \text{ cm}$

Radius of single cylinder = 5cm

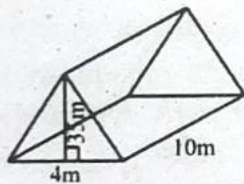
Total surface area =  $2\pi r(h + r)$

$$= 2 \times \frac{22}{7} \times 5(60 + 5)$$

$$= \frac{44 \times 5 \times 65}{7}$$

$$= 2042.86 \text{ cm}^2$$

**(b)** Find the surface area and volume of the given triangular prism.



**Ans.** Height = 3.5m

Base = 4m

Length = 10m

Surface area =  $3lb + bh$

$$= (3 \times 10 \times 4) + (4 \times 3.5)$$

$$= 134 \text{ m}^2$$

Volume of triangular prism = ?

$$= \frac{1}{2} b \times h \times l$$

$$= \frac{1}{2} \times 4 \times 3.5 \times 10$$

$$= 4 \times 3.5 \times 5$$

$$= 20 \times 3.5 = 70 \text{ m}^3$$

## Asan Model Paper 6

### Section A -- MCQ's (10 marks)

Choose the correct option.

- 10km 200m is equal to \_\_\_\_\_.  
(a) 100200m (b) 1020m  
(c) 10200m (d) None of these
- 120m, 78cm = \_\_\_\_\_ cm.  
(a) 1278cm (b) 120078cm  
(c) 12178cm (d) 12078cm
- 95km = \_\_\_\_\_ cm.  
(a) 95000cm (b) 950000cm  
(c) 95000000cm (d) 9500000cm
- 3900 seconds = \_\_\_\_\_ minutes \_\_\_\_\_ sec.  
(a) 65 minutes (b) 68 minutes  
(c) 48 minutes (d) 69 minutes
- If area of a square is  $16 \text{ m}^2$ , its perimeter will be \_\_\_\_\_.  
(a) 26m (b) 16m  
(c) 25m (d) 36m
- $1 \text{ m}^2 = \text{_____ mm}^2$ .  
(a) 100000mm<sup>2</sup> (b) 1000000mm<sup>2</sup>  
(c) 10000mm<sup>2</sup> (d) None of these
- Surface area of cylinder = \_\_\_\_\_.  
(a)  $2\pi r$  (b)  $2\pi rh$   
(c)  $2\pi r(h + r)$  (d) None of these
- If radius of a well is 2m and 100m deep. Its volume is \_\_\_\_\_.  
(a) 1057m<sup>3</sup> (b) 1257.14m<sup>3</sup>  
(c) 1457m<sup>3</sup> (d) None of these
- Length, breadth and height of a room is 7m, 5m, 5m respectively. Its volume is \_\_\_\_\_.  
(a) 275m<sup>3</sup> (b) 165m<sup>3</sup>  
(c) 175m<sup>3</sup> (d) None of these
- If each side of a cube is 3cm. Its volume is \_\_\_\_\_.  
(a) 6cm<sup>3</sup> (b) 18cm<sup>3</sup>  
(c) 9cm<sup>3</sup> (d) 24cm<sup>3</sup>

**Ans.**

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

**Section B – Fill in the Blanks (10 marks)**

Fill in the blanks with appropriate mathematical statements.

1.  $4000m = \underline{\hspace{2cm}} km.$

Ans. 4km

2.  $8m\ 25cm = \underline{\hspace{2cm}} m.$

Ans. 8.25m

3.  $120m + 78cm = \underline{\hspace{2cm}} cm.$

Ans. 12078cm

4.  $12\ months + 15\ days = \underline{\hspace{2cm}} days.$

Ans. 375 days

5.  $56\ months = \underline{\hspace{2cm}} year\ \underline{\hspace{2cm}} months.$

Ans. 4 years + 8 months

6.  $870\ days = \underline{\hspace{2cm}} years\ \underline{\hspace{2cm}} days.$

Ans. 2 years + 140 days

7.  $1400mm^2 = \underline{\hspace{2cm}} cm^2.$

Ans. 0.0014m<sup>2</sup>

8.  $1400mm^2 = \underline{\hspace{2cm}} cm^2.$

Ans. 14cm<sup>2</sup>

9. If radius of a circle is 10cm. Its area is  $\underline{\hspace{2cm}}.$

Ans. 314.28cm<sup>2</sup>

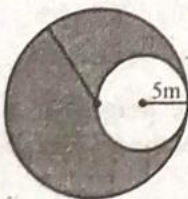
10. If radius of a circle is 2cm, its circumference  $\underline{\hspace{2cm}}.$

Ans. 12.57cm

**Section C – Subjective (80 marks)**

**Q.1 Find the area of the shaded region.**

(i)



Area of outer circle = ?

$$= \pi r^2 = \frac{22}{7} \times 10 \times 10 = \frac{2200}{7} = 314.28m^2$$

Area of inner circle =  $\pi r^2$

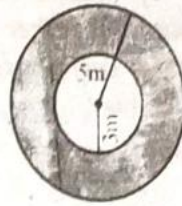
$$= \frac{22}{7} \times 5 \times 5$$

$$= \frac{550}{7} = 78.57m^2$$

Area of shaded region =  $314.28 - 78.58$

$$= 235.708 = 235.71m^2$$

(ii)



Ans. Area of outer circle = ?

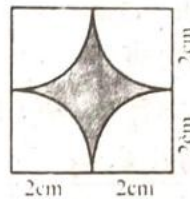
$$= \pi r^2 = \frac{22}{7} \times 5 \times 5 = \frac{550}{7} = 78.57m^2$$

Area of inner circle =  $\pi r^2$

$$= \frac{22}{7} \times 3 \times 3 = \frac{198}{7} = 28.285 = 28.29m^2$$

$$\text{Area of shaded region} = 78.57 - 28.29 = 50.28m^2$$

(iii)



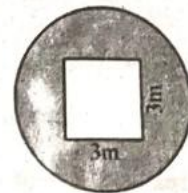
Ans. Area of square =  $4 \times 4 = 16cm^2$

Area of 4 quarter – circles = Area of 1 circle

$$= \pi r^2 = \frac{22}{7} \times 2 \times 2 = \frac{88}{7} = 12.57cm^2$$

$$\text{Area of shaded region} = 16 - 12.57 = 3.43cm^2$$

**Q.2(a) There is a square platform inside a circular park. Find the area of the grassy land ( $r = 21m$ ).**



Ans. Radius = 21m

$$\begin{aligned} \text{Area of outer circle} &= \pi r^2 = \frac{22}{7} \times 21 \times 21 \\ &= 22 \times 3 \times 21 = 1386m^2 \end{aligned}$$

$$\text{Area of internal square} = 3 \times 3 = 9m^2$$

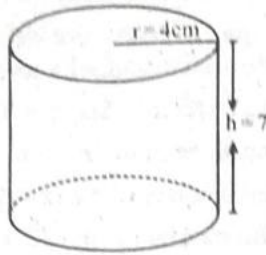
$$\text{Area of grass land} = 1386 - 9 = 1377m^2$$

**(b) If the radius and height of the cylinder are 4cm and 7cm respectively. Find the surface area of the given cylinder.**

Ans. Surface area of the Cylinder =  $2\pi r (r + h)$

$$= 2 \times 3.14 \times 4cm (4cm + 7cm)$$

$$= 25.12cm \times 11cm = 276.32cm^2$$



**Q.3(a)** If the length, base and height of a triangular prism are 10cm, 5cm and 3.5cm respectively. Find the surface area and volume of prism.

**Ans.** Length of triangular prism = 10cm =  $l$   
 Base of triangular prism = 5cm =  $b$   
 Height triangular prism = 3.5cm =  $h$   
 Surface area =  $3lb + bh$   
 $= (3 \times 10 \times 5) + (5 \times 3.5)$   
 $= 150 + 17.5 = 167.5\text{cm}^2$

Volume of triangular prism =  $\frac{1}{2}bhl$   
 $= \frac{1}{2} \times 5 \times 3.5 \times 10$   
 $= \frac{5 \times 35 \times 5}{2}$   
 $= \frac{175}{2} = 87.5\text{cm}^3$

**(b)** The length of a cubic tank is 10m. Find the volume of the tank.

**Ans.** Length of cubic tank = 10m  
 Volume of tank =  $l \times w \times h$   
 $= 10 \times 10 \times 10 = 1000\text{m}^3$

**Q.4(a)** The dimensions of a wooden right triangular prism are  $l = 8\text{cm}$ ,  $b = 5\text{cm}$  and  $h = 5\text{cm}$ . Find the surface area and volume of the prism.

**Ans.** Length of a right triangular prism = 8cm  
 Breadth of a right triangular prism = 5cm  
 Height of a right triangular prism = 5cm  
 Surface area =  $3lb + bh$   
 $= (3 \times 8 \times 5) + (5 \times 5)$   
 $= 120 + 25 = 145\text{cm}^2$

Volume =  $\frac{1}{2} \times b \times h \times l$   
 $= \frac{1}{2} \times 5 \times 5 \times 8$   
 $= 5 \times 5 \times 4 = 100\text{cm}^3$

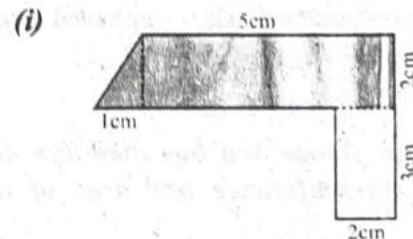
**(b)** The length, base and height of a right triangular prism like a hut are 5m, 4m, 3.5m respectively. Find the surface area and volume of the hut.

**Ans.** Length of a triangular prism = 5m  
 Base of a triangular prism = 4m  
 Height of a triangular prism = 3.5m

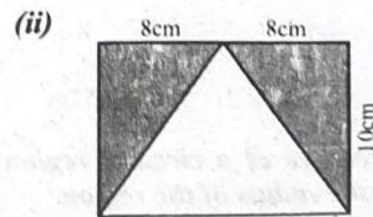
Surface area =  $3lb + bh$   
 $= (3 \times 5 \times 4) + (4 \times 3.5)$   
 $= 60 + 14 = 74\text{m}^2$

Volume =  $\frac{1}{2} \times b \times h \times l$   
 $= \frac{1}{2} \times 4 \times 3.5 \times 5$   
 $= 2 \times 3.5 \times 5$   
 $= 10 \times 3.5 = 35\text{cm}^3$

**Q.5** Find the shaded and unshaded area of the following composite shapes.

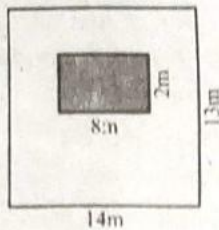


**Ans.** Unshaded area =  $2 \times 3 = 6\text{cm}^2$   
 Shaded area =  $(5 \times 2) + \left(\frac{1}{2} \times 1 \times 2\right)$   
 $= 10 + 1$   
 $= 11\text{cm}^2$



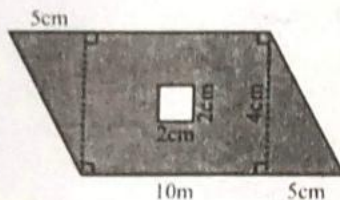
**Ans.** Unshaded area =  $\frac{1}{2} \times b \times h$   
 $= \frac{1}{2} \times 16 \times 10$   
 $= 80\text{cm}^2$   
 Shaded area =  $2 \times \frac{1}{2} \times \text{base} \times \text{height}$   
 $= 2 \times \frac{1}{2} \times 8 \times 1$   
 $= 80\text{cm}^2$

(iii)



**Ans.** Shaded area =  $8 \times 2 = 16\text{m}^2$   
 Unshaded area =  $(14 \times 13) - 16$   
 $= 182 - 16 = 166\text{m}^2$

(iv)



**Ans.** Unshaded area =  $2 \times 2 = 4\text{cm}^2$   
 Shaded area = (base  $\times$  height) – unshaded areas  
 $= (10 \times 4) - 4$   
 $= 40 - 4 = 36\text{cm}^2$

**Q.6(a)** A circular flower bed has diameter 4m. Find the circumference and area of the bed.

**Ans.** Diameter of circle = 4m  
 Radius =  $\frac{4}{2} = 2\text{m}$   
 Circumference =  $2\pi r$   
 $= 2 \times \frac{22}{7} \times 2 = \frac{88}{7} = 12.57\text{m}$   
 Area of circle =  $\pi r^2$   
 $= \frac{22}{7} \times 2 \times 2 = \frac{88}{7} = 12.57\text{m}^2$

**(b)** The circumference of a circular region is 31.4m. Find the radius of the region.

**Ans.** Circumference of circle = 31.4m  
 $2\pi r = 31.4$   
 $2 \times \frac{22}{7} \times r = 31.4$   
 $\frac{7}{44} \times \frac{44}{7} \times r = \frac{314}{10} \times \frac{7}{44}$   
 $r = \frac{314 \times 7}{440} = \frac{2198}{440} = 4.995 = 5\text{m}$

**Q.7(a)** A bus moves at the speed of 32 km/h for an hour and 50 km/h for 2 hours. Find the average speed of the bus.

**Ans.** Since time intervals are different, so first we calculate total distance by using the formula:

Distance covered = Speed  $\times$  Time

Distance covered in first hour =  $32 \times 1 = 32\text{km}$

Distance covered in next 2 hours =  $50 \times 2 = 100\text{km}$

Total distance covered =  $32 + 100 = 132\text{km}$

Average speed =  $\frac{\text{Total distance covered}}{\text{Total time taken}}$

Average speed =  $\frac{132}{3} = 44\text{ km/h}$

**(b)** A loaded truck is traveling at uniform speed. If it covers 60 km in 1 hour. How much distance will it cover in 8 hours.

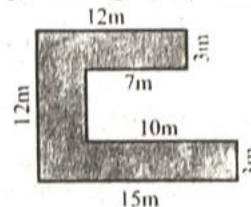
**Ans.** In an hour distance covered = 60km

In 8 hours distance covered =  $60 \times 8 = 480\text{km}$

Hence, the truck will cover 480km in 8 hours at uniform speed.

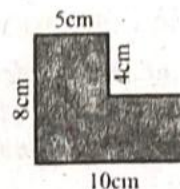
**Q.8** Find the area and perimeter of the following composite figures:

(i)



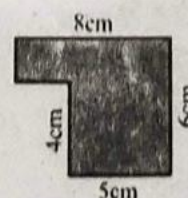
**Ans.** Area =  $(15 \times 3) + (12 \times 3) + (6 \times 5)$   
 $= 45 + 36 + 30 = 111\text{m}^2$   
 Perimeter =  $12 + 12 + 15 + 3 + 10 + 6 + 7 + 3$   
 $= 68\text{m}$

(ii)



**Ans.** Area =  $(5 \times 4) + (10 \times 4)$   
 $= 20 + 40 = 60\text{cm}^2$   
 Perimeter =  $5 + 8 + 10 + 4 + 5 + 4$   
 $= 36\text{cm}$

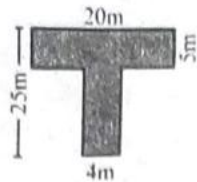
(iii)



**Ans.** Area =  $(5 \times 6) + (3 \times 2)$   
 $= 30 + 6 = 36\text{cm}^2$

$$\text{Perimeter} = 8 + 2 + 3 + 4 + 5 + 6 = 28\text{cm}$$

(iv)



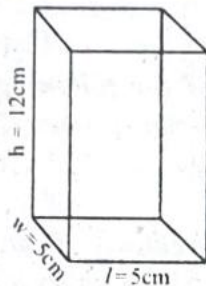
$$\begin{aligned}\text{Ans. Area} &= (20 \times 5) + (20 \times 4) \\ &= 100 + 80 = 180\text{m}^2\end{aligned}$$

$$\text{Perimeter} = 20 + 5 + 8 + 15 + 4 + 15 + 8 + 5 = 80\text{m}$$

**Test Your Memory**

**Q.1** Find the surface area and volume of the given right square prism.

**Ans.** Given;  $h = 12\text{cm}$ ,  $w = l = 5\text{cm}$



$$\begin{aligned}\text{Surface area of right square prism} &= 2l^2 + 4lh \text{ unit}^2 \\ &= 2l^2 + 4lh \text{ unit}^2 \\ &= 2(5)^2 + 4(5)(12) \\ &= 50 + 240 \\ &= 290\text{cm}^2\end{aligned}$$

$$\begin{aligned}\text{Volume of right square prism} &= l^2h \\ &= (5)^2(12)\text{cm}^3 \\ &= 300\text{cm}^3\end{aligned}$$

**Q.2** Find the surface area and volume of the given shape.

**Ans.** Given;  $h = 5\text{cm}$ ,  $l = 15\text{cm}$  and  $w = 8\text{cm}$

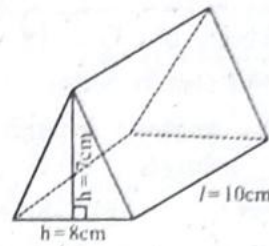
$$\begin{aligned}\text{Surface area of the right rectangular prism} &= 2lw + 2h + hl \\ &= 2[(15)(8) + (8)(5) + (15)(5)] \\ &= 2[120 + 40 + 75] = 470\text{cm}^2\end{aligned}$$

$$\begin{aligned}\text{Volume of the right rectangular prism} &= l \times w \times h = [(15)(8)(5)] = 600\text{cm}^3\end{aligned}$$

**Q.3** If the length, base and height of the triangular prism are 10cm, 8cm and 7cm respectively then, find the surface area of the right triangular prism.

**Ans.** Surface area of the triangular prism  
 $= 3/b + bh$

$$\begin{aligned}&= 3(10\text{cm})(8\text{cm}) + (8\text{cm})(7\text{cm}) \\ &= 240 + 56 \\ &= 296\text{cm}^2\end{aligned}$$



**Q.4** If the length, base and height of the right triangular prism are 9cm, 8cm and 7cm respectively then, find the volume of right triangular prism.

$$\begin{aligned}\text{Ans. Volume of right triangular prism} &= \frac{1}{2}b \times h \times l \\ &= \frac{1}{2}(8)(7)(9) \\ &= 252\text{cm}^3\end{aligned}$$

**Q.5** The length of a cubic box is 5cm. Find volume of the box and convert it into  $\text{m}^3$  and  $\text{mm}^3$ .

$$\begin{aligned}\text{Ans. Volume of the cubic box} &= 5\text{cm} \times 5\text{cm} \times 5\text{cm} \\ &= 125\text{cm}^3 \\ &= 125 \times \frac{1}{1000000} \text{m}^3 \\ &= 0.000125\text{m}^3 \\ &= 125 \times 1000\text{mm}^3 \\ &= 125000\text{mm}^3\end{aligned}$$

## Asan Model Paper 29

(Based on Khyber Pakhtoonkhwa Syllabus)

### Section A – MCQ's (30 marks)

Choose the correct option.

1. 125 men can construct a road in 120 days. How many men can do the same work in 100 days.

(a) 140 (b) 130  
(c) 145 (d) 150

2. The difference of two numbers is 4. The sum of twice of one number and three times of the other number is 43. Find the numbers.

(a) (11, 7) (b) (12, 8)  
(c) (7, 11) (d) (15, 11)

3. In a triangle, the sum of interior angle is \_\_\_\_\_.

(a)  $90^\circ$  (b)  $120^\circ$   
(c)  $180^\circ$  (d)  $360^\circ$

4. If the diameter of a circle is 10cm, then what will be its radius?

(a) 10cm (b) 5cm  
(c) 15cm (d) 20cm

5. Naeem gave 25% of a profit to his partner. If the partner got Rs. 3000, what remains with him.

(a) Rs. 11,000 (b) Rs. 10,000  
(c) Rs. 14,000 (d) Rs. 12,000

6. Find the mean proportional of 4 and 16.

(a) 6 (b) 8  
(c) 12 (d) 10

7. What will be 60.5% of 8 hours?

(a) 4.84 (b) 4.82  
(c) 4.64 (d) 4.80

8. Bisection means divide into \_\_\_\_\_ equal parts.

(a) three (b) two  
(c) four (d) six

9. If length of a cube is 10cm when what will be its volume?

(a)  $100\text{cm}^2$  (b)  $1000\text{cm}^2$   
(c)  $1000\text{cm}^3$  (d)  $100000\text{cm}^3$

10. Simplification of  $32 + 4 - \{5 - (4 - 1)\}$  is \_\_\_\_\_.

(a) 12 (b) 16  
(c) 6 (d) 8

11.  $\pi$  is \_\_\_\_\_ number.

(a) irrational (b) rational  
(c) natural (d) whole

12.  $\frac{1}{20}$  is \_\_\_\_\_.

(a) terminating decimal  
(b) non-terminating decimal  
(c) whole no  
(d) None of above

13.  $\frac{25}{7}$  is \_\_\_\_\_ number.

(a) terminating (b) non-terminating  
(c) recurring (d) None of these

14. If the perimeter of a square shaped garden is 40m the area is:

(a)  $160\text{m}^2$  (b)  $400\text{m}^2$   
(c)  $100\text{m}^2$  (d)  $1600\text{m}^2$

15.  $x^2 - 25 = ?$

(a)  $(x - 5)$  (b)  $(x + 5)$   
(c)  $(x - 5)(x + 5)$  (d)  $(x + 5)^2$

16. The circumference of circle with radius  $\frac{7}{22}$  is:

(a) 1m (b) 2m  
(c) 3m (d) 4m

17.  $\left[ 1 + \{2 \times \{5 - (1 + \overline{6 \div 2})\}\} \right]$

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

18. 1% of 1000 means.

(a) 1 (b) 10  
(c) 100 (d) 1000

19. If the base of a triangle is 3cm and height 2cm, then its area will be:

(a) 2cm (b) 3cm  
(c) 5cm (d) 6cm

20. The ratio of measurement of angles in a quadrilateral is ABCD is 3 : 4 : 5 : 6 for

$$\text{Ans.} = \frac{7}{12} \times \frac{39}{14} = \frac{7^1}{12^4} \times \frac{39^{13}}{14^2} = \frac{13}{8} = 1 \frac{5}{8}$$

$$(ii) \frac{-25}{31} \text{ by } \frac{5}{-62}$$

$$\text{Ans.} = \frac{-25}{31} \times \frac{-62}{5} = \frac{25^5 \times 62^2}{31^1 \times 5^1} = 10$$

(b) Ahtasham bought  $\frac{16}{5}$  litres of honey and Talha bought  $\frac{12}{7}$  litres of honey.

(i) How much honey did they buy altogether?

$$\text{Ans.} \text{ Ahtasham bought honey} = \frac{16}{5} \text{ litres}$$

$$\text{Talha bought honey} = \frac{12}{7} \text{ litres}$$

$$\text{Total honey bought} = \frac{16}{5} + \frac{12}{7} = \frac{112 + 60}{35}$$

$$\text{Total honey bought} = \frac{172}{35} \text{ litres}$$

$$\text{Total honey bought} = 4 \frac{32}{35} \text{ litres}$$

(ii) How much more honey did Ahtasham buy than Talha?

$$\text{Ans.} \text{ Ahtasham bought more} = \frac{16}{5} - \frac{12}{7}$$

$$\text{Ahtasham bought more} = \frac{112 - 60}{35} = \frac{52}{35}$$

$$\text{Ahtasham bought more} = \frac{52}{35} \text{ litres}$$

Q.2(a) The length of Hiba's room is 6.5m and width is 5.7m. How much will it cost to carpet the room if it costs Rs. 140 per  $m^2$ ?

$$\text{Ans.} \text{ Length of room} = 6.5\text{m}$$

$$\text{Width of room} = 5.7\text{m}$$

$$\text{Area} = l \times w = 6.5 \times 5.7 = 37.05\text{m}^2$$

$$\text{Rate} = \text{Rs. } 140/\text{m}^2$$

$$\text{Cost} = 140 \times 37.05 = \text{Rs. } 5187$$

(b) Find the square root of the following decimal numbers by factorization method.

(i) 11.56

$$\text{Ans.} \text{ LCM}$$

|    |      |
|----|------|
| 2  | 1156 |
| 2  | 578  |
| 17 | 289  |
| 17 | 17   |
|    | 1    |

$$\begin{aligned} \sqrt{11.56} &= \sqrt{\frac{1156}{100}} \\ &= \sqrt{\frac{2 \times 2 \times 17 \times 17}{10 \times 10}} \\ &= \frac{2 \times 17}{10} = \frac{34}{10} = 3.4 \end{aligned}$$

(ii) 5.29

$$\begin{aligned} \text{Ans.} \sqrt{5.29} &= \sqrt{\frac{529}{100}} \\ &= \sqrt{\frac{23 \times 23}{10 \times 10}} = \frac{23}{10} = 2.3 \end{aligned}$$

Q.4(a) Raza counted his heart beats and found that his heart beats 228 times in 3 minutes. What is his average beat rate?

$$\text{Ans.} \text{ In 3 minutes heart beats} = 228$$

$$\text{In 1 minute heart beats} = \frac{228}{3} = 76$$

$$\text{In 1 minute heart beats} = 76 \text{ minutes}$$

(b) Maha skipped the rope 108 times in 4 minutes. What is her average skipping rate per minute?

$$\text{Ans.} \text{ In 4 minutes skipped} = 108 \text{ times}$$

$$\text{In 1 minute skipped} = \frac{108}{4} = 27 \text{ times}$$

Q.5(a) A shopkeeper sold an oven for Rs. 39,900 and earned 25% profit. Find the actual price of the oven.

$$\text{Ans.} \text{ SP} = \text{Rs. } 39,900$$

$$\text{Profit \%} = 25\%$$

$$\text{CP} = x$$

$$\text{Is SP is 125, then CP} = 100$$

$$\text{If SP is 1, then CP} = \frac{100}{125}$$

$$\text{If SP is 39900 then CP} = \frac{39900 \times 100}{125}$$

$$\text{If SP is 39900 then CP} = \text{Rs. } 31920$$

(b) Sadia saves Rs. 89,000 in a year. How much will she pay as Zakat?

$$\text{Ans.} \text{ Saving} = \text{Rs. } 89000$$

$$\text{Zakat rate} = 2.5\%$$

# **ASAN Model Papers**

# **General**

# **Science**

# Contents

## General Science Class 7th

|                                                            |     |
|------------------------------------------------------------|-----|
| <b>Unit # 1 Plant System</b>                               |     |
| Model Paper # 1 .....                                      | 4   |
| Model Paper # 2 .....                                      | 12  |
| <b>Unit # 2 Human Respiratory &amp; Circulatory System</b> |     |
| Model Paper # 3 .....                                      | 20  |
| Model Paper # 4 .....                                      | 26  |
| <b>Unit # 3 Immunity &amp; Diseases</b>                    |     |
| Model Paper # 5 .....                                      | 32  |
| Model Paper # 6 .....                                      | 39  |
| <b>Unit # 4 Structure of Atom</b>                          |     |
| Model Paper # 7 .....                                      | 42  |
| Model Paper # 8 .....                                      | 48  |
| <b>Unit # 5 Physical and Chemical Changes</b>              |     |
| Model Paper # 9 .....                                      | 52  |
| Model Paper # 10 .....                                     | 60  |
| <b>Unit # 6 Chemical Bonds</b>                             |     |
| Model Paper # 11 .....                                     | 64  |
| Model Paper # 12 .....                                     | 71  |
| <b>Half Book Test 1</b>                                    |     |
| Model Paper # 13 .....                                     | 74  |
| <b>Half Book Test 2</b>                                    |     |
| Model Paper # 14 .....                                     | 82  |
| <b>Unit # 7 Solutions</b>                                  |     |
| Model Paper # 15 .....                                     | 90  |
| <b>Unit # 8 Force &amp; Motion</b>                         |     |
| Model Paper # 16 .....                                     | 96  |
| <b>Unit # 8 Force &amp; Motion</b>                         |     |
| Model Paper # 17 .....                                     | 101 |
| <b>Unit # 9 Waves &amp; Energy</b>                         |     |
| Model Paper # 18 .....                                     | 107 |
| Model Paper # 19 .....                                     | 112 |
| <b>Unit # 10 Heat &amp; Temperature</b>                    |     |
| Model Paper # 20 .....                                     | 120 |
| Model Paper # 21 .....                                     | 126 |
| <b>Unit # 11 Technology in everyday life</b>               |     |
| Model Paper # 22 .....                                     | 131 |
| <b>Unit # 12 Earth &amp; Space</b>                         |     |
| Model Paper # 23 .....                                     | 137 |
| Model Paper # 24 .....                                     | 142 |
| <b>Full Book Test 1</b>                                    |     |
| Model Paper # 25 .....                                     | 147 |

## Full Book Test 2

|                        |     |
|------------------------|-----|
| Model Paper # 26 ..... | 149 |
|------------------------|-----|

## General Science Class 6th

### Unit # 1 Cellular Organization

|                       |     |
|-----------------------|-----|
| Model Paper # 1 ..... | 153 |
| Model Paper # 2 ..... | 159 |

### Unit # 2 Reproduction in plants

|                       |     |
|-----------------------|-----|
| Model Paper # 3 ..... | 165 |
| Model Paper # 4 ..... | 170 |

### Unit # 3 Balanced Diet

|                       |     |
|-----------------------|-----|
| Model Paper # 5 ..... | 175 |
| Model Paper # 6 ..... | 181 |

### Unit # 7 Human Digestive System

|                       |     |
|-----------------------|-----|
| Model Paper # 7 ..... | 184 |
| Model Paper # 8 ..... | 188 |

### Unit # 5 Matter as Particles

|                        |     |
|------------------------|-----|
| Model Paper # 9 .....  | 191 |
| Model Paper # 10 ..... | 197 |

### Unit # 6 Elements and compounds

|                        |     |
|------------------------|-----|
| Model Paper # 11 ..... | 201 |
| Model Paper # 12 ..... | 206 |

### Unit # 7 Mixtures

|                        |     |
|------------------------|-----|
| Model Paper # 13 ..... | 212 |
| Model Paper # 14 ..... | 218 |

### Unit # 8 Energy

|                        |     |
|------------------------|-----|
| Model Paper # 15 ..... | 225 |
| Model Paper # 16 ..... | 230 |

### Unit # 9 Electricity

|                        |     |
|------------------------|-----|
| Model Paper # 17 ..... | 235 |
| Model Paper # 18 ..... | 239 |

### Unit # 10 Magnetism

|                        |     |
|------------------------|-----|
| Model Paper # 19 ..... | 243 |
| Model Paper # 20 ..... | 248 |

### Unit # 11 Technology in everyday life

|                        |     |
|------------------------|-----|
| Model Paper # 21 ..... | 251 |
| Model Paper # 22 ..... | 256 |

### Unit # 12 Solar System

|                        |     |
|------------------------|-----|
| Model Paper # 23 ..... | 259 |
| Model Paper # 24 ..... | 265 |

## Unit # 1 Plant System

## Model Paper # 1

### Section - A

### Multiple Choice Questions

Time: 20 Minutes

Total Marks: 30

1. Water and dissolved salts are conducted from roots to leaves by:
  - a. root hairs      b. xylem
  - c. phloem        d. stomata
2. The innermost layer of cortex in the root:
  - a. epidermis      b. endodermis
  - c. pericycle      d. cambium
3. What is required for photosynthesis in addition to light?
  - a. oxygen and carbon dioxide
  - b. oxygen and water
  - c. carbon dioxide and water
  - d. nitrogen and water
4. Oxygen and ..... are the products of photosynthesis:
  - a. water            b. carbon dioxide
  - c. glucose         d. chlorophyll
5. The products of respiration are carbon dioxide and:
  - a. water            b. oxygen
  - c. mitochondria   d. chloroplast
6. The loss of water from aerial parts of the plants:
  - a. respiration      b. photosynthesis
  - c. evaporation     d. transpiration
7. Chlorophyll is present in:
  - a. mesophyll cells   b. upper epidermis
  - c. lower epidermis   d. endodermis
8. Mineral required in the formation of chlorophyll:
  - a. iodine            b. iron
  - c. phosphorus      d. magnesium
9. The force between the molecules of water:
  - a. adhesive force   b. cohesive force
  - c. repulsive force   d. magnetic force
10. Rate of transpiration decreases with the increase of:
  - a. temperature      b. light intensity
  - c. humidity in air    d. wind speed
11. Chlorophyll reflects:
  - a. red colour        b. white colour
  - c. green colour      d. blue colour
12. Xylem transports:
  - a. water             b. food
  - c. fats                d. none of these
13. Stomata open to allow \_\_\_\_\_ the plant.
  - a. sugar into
  - b. sugar out of
  - c. carbon dioxide into
  - d. light into
14. Products of photosynthesis are:
  - a. carbon dioxide and water
  - b. hydrogen and water
  - c. glucose and carbon dioxide
  - d. glucose and oxygen
15. How does chlorophyll help a plant?
  - a. It absorbs light energy in photosynthesis
  - b. It moves water and minerals through the plant
  - c. It moves sugar and water through the plant
  - d. It absorbs water
16. Which is correct for leaves to make food?
  - a. flat surface
  - b. presence of large number of stomata
  - c. thick layer of mesophyll cells
  - d. all of these
17. Respiration takes place in \_\_\_\_\_ of cells.
  - a. chloroplasts      b. mitochondria
  - c. nucleus            d. cell membrane
18. Food making process of plants is
  - a. Photosynthesis   b. respiration
  - c. Both a and b      d. none of these
19. Energy Producing Process of living things is
  - a. Respiration       b. Photosynthesis
  - c. Both a and b      d. None of these.

20. The Food Factories of the plants are
  - a. Roots
  - b. Stem
  - c. Leaves
  - d. None of these
21. Parts of internal leaf of plants are
  - a. 1
  - b. 2
  - c. 3
  - d. 4
22. The lower epidermis of the leaf has an opening and two bean shaped guard cells called
  - a. Stomata
  - b. Mesophyll
  - c. Vascular bundles
  - d. None of these
23. Functions of stomata are
  - a. Exchange of oxygen
  - b. Exchange of carbon dioxide
  - c. Exchange of water vapours between leaf cells
  - d. All of these
24. Between the upper and lower epidermis of leaf is
  - a. Chloroplasts
  - b. Stomata
  - c. Xylem
  - d. Mesophyll
25. Photosynthesis takes place in which part of the leaf
  - a. Mesophyll
  - b. Stomata
  - c. Chloroplasts
  - d. Xylem
26. The central part of the mesophyll tissue is made of
  - a. Vascular bundles
  - b. Xylem
  - c. Phloem
  - d. All of these
27. The tissue that carries water from roots to leaves is
  - a. Phloem
  - b. Xylem
  - c. Both
  - d. None of these
28. The word equation for Photosynthesis is
  - a. Carbon dioxide + water  $\longrightarrow$  glucose + Oxygen
  - b. Carbon dioxide + water  $\longrightarrow$  Oxygen + Salt
  - c. Carbon dioxide + water  $\longrightarrow$  Oxygen + Food
  - d. None of these

29. The word Photosynthesis is a combination of two Greek words photo means
  - a. Dark
  - b. Light
  - c. Heat
  - d. None of these
30. Rate of Photosynthesis increases with increase of
  - a. Temperature
  - b. Carbon dioxide
  - c. Light
  - d. All of these

### Solution: Section - A (MCQs)

#### Solution:

|       |       |       |       |     |
|-------|-------|-------|-------|-----|
| 1. b  | 2. b  | 3. c  | 4. c  | 5.  |
| 6. d  | 7. a  | 8. d  | 9. b  | 10. |
| 11. c | 12. a | 13. c | 14. d | 15. |
| 16. d | 17. b | 18. a | 19. a | 20. |
| 21. c | 22. a | 23. d | 24. d | 25. |
| 26. d | 27. b | 28. a | 29. b | 30. |

### Section - B (Short Questions)

#### 1. What is primary root?

Ans: The initial root which grows from radical of embryo is called primary root.

#### 2. What is secondary root?

Ans: The branch of primary root is called secondary root.

#### 3. State the function of root cap.

Ans: The root cap protects the new born soft tissue from being damaged and environmental diseases.

#### 4. Write word equation for photosynthesis.

Ans:  $\text{CO}_2 + \text{H}_2\text{O} \xrightarrow{\text{Sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$   
Carbon dioxide + Water  $\xrightarrow{\text{Sun Light}}$  Glucose + Oxygen

#### 5. Write word equation for respiration

Ans: Glucose + Oxygen  $\longrightarrow$  Carbon dioxide + Water + Energy

#### 6. Differentiate between root system and shoot system

Ans:

|    | Root System                                                                  | Shoot System                                                                                          |
|----|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1. | The underground system of plants is called root system.                      | The aerial parts of the plants (stem, branches, leaves, flowers, fruits) form shoot system of plants. |
| 2. | Root system contains root hairs, primary root (tap root) and secondary root. | Shoot system consists of stem, branches, flowers and fruits.                                          |
| 3. | Root system contains xylem, phloem, cortex and apical meristem.              | Shoot system contains xylem, phloem, cortex and pith.                                                 |

### 7. Differentiate between xylem and phloem

Ans:

|    | Xylem                                                                             | Phloem                                                                                                       |
|----|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1. | Xylem is a plant tissue (Vascular bundle).                                        | Phloem is a plant tissue (Vascular bundle).                                                                  |
| 2. | Xylem conducts water and minerals absorbed from the roots to leaves through stem. | Phloem transports food from leaves to roots and other parts of a plant.                                      |
| 3. | Xylem vessels form a pipeline from roots to leaves, in only one direction.        | Phloem sieve tube elements receive through companion cells are transported to all other parts of plant body. |
| 4. | Xylem tissue consists of dead cells.                                              | Phloem tissue consists of living cells.                                                                      |

### 8. Differentiate between Diffusion and osmosis

Ans:

|    | Diffusion                                                                                                                          | Osmosis                                                                 |
|----|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1. | Movement of molecules (material particles) from the area where they are more, to the area where they are less is called diffusion. | The diffusion through membranes (like cell membrane) is called osmosis. |

|    |                                                                                                                   |                                                                                                               |
|----|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 2. | The movement of molecules from a <i>higher</i> concentration of solute to a <i>lower</i> concentration of solute. | The movement of solvent from <i>lower</i> concentration of solute to a <i>higher</i> concentration of solute. |
|----|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|

### 9. Differentiate between Epidermis and endodermis

Ans:

|    | Epidermis                                 | Endodermis                                                         |
|----|-------------------------------------------|--------------------------------------------------------------------|
| 1. | The outermost layer of plants.            | Inner protective layer found in roots.                             |
| 2. | Protects the plant from outside world.    | Helps the plant to regulate the flow of water in and out of plant. |
| 3. | Replaced by periderm in secondary growth. | Surrounds the vascular bundles.                                    |
| 4. | Contains cells with thick walls.          | Contains tightly packed cells.                                     |

### 10. Differentiate between Transpiration and evaporation

Ans:

|    | Transpiration                              | Evaporation                                                                                   |
|----|--------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1. | Water evaporates from leaves of the plant. | Surface water absorbs heat energy from Sun, changes from liquid to gaseous form i.e. vapours. |
| 2. | Transpiration is faster than evaporation.  | Evaporation is slower than transpiration.                                                     |
| 3. | Regulated process.                         | Non-regulated process.                                                                        |
| 4. | Guard cells involved.                      | No role of guard cells.                                                                       |
| 5. | Loss of water from free surface of cells.  | Loss of water from the free surface of water.                                                 |

## Section - C (Long Questions)

### Q 1. a. Define Science. Why do we study science?

Ans: Science:

Science came from the Latin word, "Scientia" which means knowledge, a knowing, expertness or experience, covering general truth.

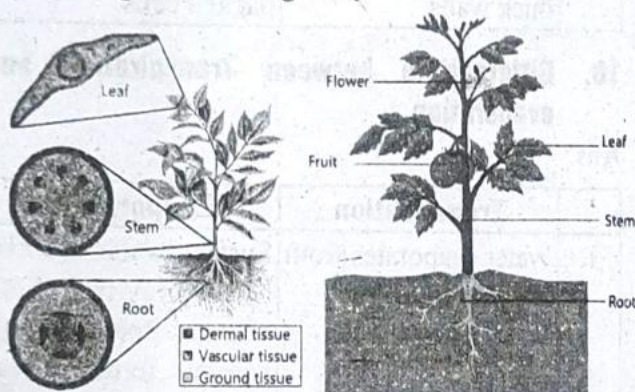
### Why we study science:

Science is research-based knowledge, practice-based skill and inquiry-based approach to investigate and learn further through scientific method. The key activities involved in scientific method are observation, experimentation and deduction. Technology is application of scientific knowledge for solving daily life problems, making arduous works easy and improving quality of life. In order to meet the globally recognized standards, we need to broaden our educating horizons and adopt scientific method to learn science.

The inquiries and activities of scientific method involve observations, experimentations and conclusions. Hypothesis, theory and principle, etc., are the developmental stages in scientific research.

### b. Name the organs and organ system in plants.

Ans: Organs and Organ System in Plants:



### Organs and organ systems in plants

### c. Name the two major systems of plants.

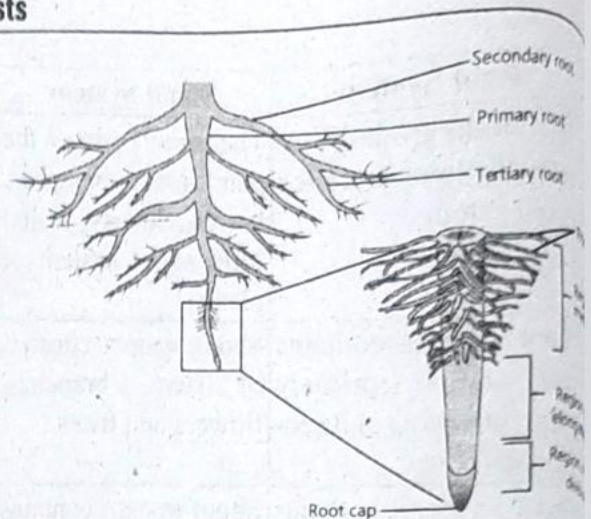
Ans: Plants have two major systems:

- (a) Roots system (b) Shoot system

### Q 2. a. Describe the structure and function of the Root system in plants.

Ans: Root System:

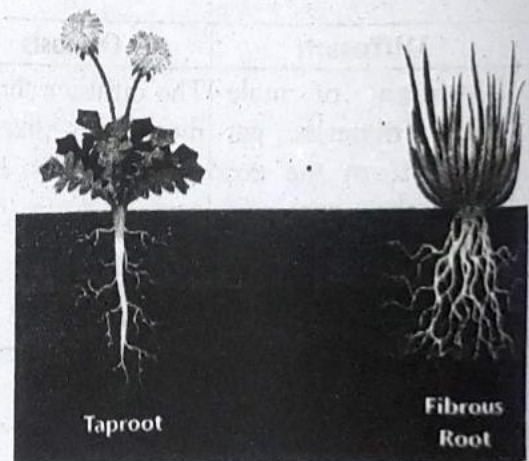
Roots are the underground parts of the plants forming a system specialized for absorption of water and minerals from the soil (Figure).



### Parts of root

The initial root which grows from radicle of embryo is the **primary root** or **tap root**. Its branches form **secondary** and **tertiary** root system. The tips of roots and shoots in plants consist of tissues formed by the cells called meristematic tissue. These cells are specialized for growth. These cells increase in number by rapid cell division.

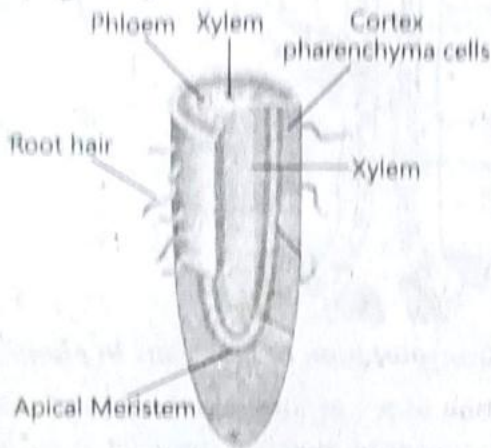
Root tip is covered by hard and protective structure called **root cap**. It protects the newly born cells from being damaged and environmental stresses. It enables root tip to grow through soil. More cells are formed by rapid cell divisions in region causing the root to grow deep into the soil and elongate the root behind. The **region of maturation** has root hairs. **Root hairs** are thread like outgrowths of epidermal cells which increase the surface area for absorption of water. Plants, like grasses and strawberry have thread like roots spread in soil but not growing deep. Such roots are called **fibrous roots** (Figure).



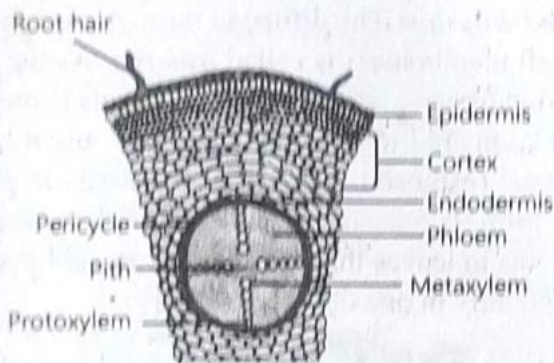
### Taproot and fibrous roots

### Internal structure of root

The main parts in the internal structure of root are epidermis, cortex, *endodermis*, vascular bundles, i.e., *xylem* and *phloem* (Figure a). The arrangement of these parts are shown in a transverse section (TS) of the root. (Figure b).



a. Structures inside the root



b. Internal structure of root

#### Epidermis:

Epidermis is an outermost layer of thin walled cells having unicellular outgrowths called root hairs. Epidermis provides protection and helps in absorption of water and minerals from the soil.

#### Cortex:

Inside the epidermis, many layers of thin walled and rounded cells form cortex. Water and minerals absorbed by root hairs in epidermis are transported towards xylem through cortex for onward conduction to leaves.

#### Endodermis:

The innermost layer of cortex which consists of barrel shaped cells is called endodermis. It regulates the movement of water and hormones, etc., into and out of the vascular system.

#### Vascular system:

Xylem and phloem form vascular system. Xy-

lem conducts water and minerals absorbed from roots to leaves through stem. Phloem transports food from leaves to roots and other parts of the plants.

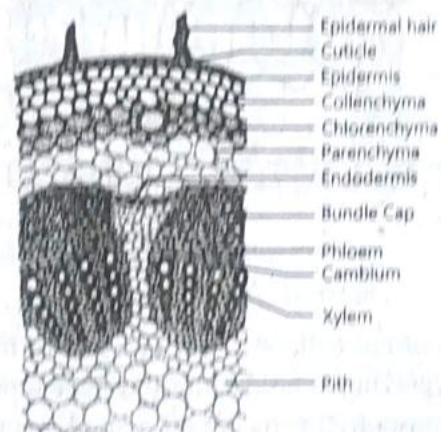
### b. Describe the structure and function of the Shoot system in plants.

Ans: Shoot System:

The areal parts of the plants such as stem, its branches, leaves, flowers and fruit, etc., specialized for different functions make the **shoot system**. Here we will discuss stem and leaves.

#### a. Stem:

Stem is usually the aerial part of the plant. It provides support to its branches, leaves, flowers and fruit, etc. Vascular bundles (xylem and phloem) run through stem to leaves for transport of material within the plant body. A sketch of internal structure of stem (Figure) is self-explanatory with regards to the arrangement of different tissues in the plants.



Internal structure of stem

#### b. Leaf:

Stem and its branches bear leaves. Leaves are the organs which are well exposed to light and well adapted for preparation of food during photosynthesis. A leaf is provided with the stalk called **petiole**. Its flat green part is called **blade** or **lamina**, which has many veins. The middle strong vein is called **midrib**.

# Model Paper # 6

## Section - A

### Multiple Choice Questions

Time: 20 Minutes

Total Marks: 25

1. Test of Saliva help in the diagnosis of:
  - a. Malaria
  - b. Hepatitis-B
  - c. Typhoid
  - d. Covid-19
2. Skin and mucous membrane are:
  - a. Innate immunity
  - b. 1st line defense
  - c. 2nd line defense
  - d. Both a & b
3. Antibodies are:
  - a. Antibiotics
  - b. Proteins
  - c. Vitamins
  - d. None of these
4. Our body has a powerful army is called:
  - a. Nervous system
  - b. Immune system
  - c. digestive system
  - d. circulatory system
5. Which line of defence cells eating pathogens?
  - a. First line of defence
  - b. Second line of defence
  - c. Third line of defence
  - d. None of them
6. T-cells and B-cells are the:
  - a. platelets
  - b. Red blood cells
  - c. white blood cells
  - d. muscles cells
7. Antibodies are special
  - a. Proteins
  - b. fats
  - c. vitamins
  - d. carbohydrates
8. Which one works by training the immune system to recognize and fight pathogens?
  - a. Antibodies
  - b. Tablets
  - c. drugs
  - d. vaccine
9. Which type of immunity we get naturally from our mother?
  - a. Passive immunity
  - b. Innate immunity
  - c. adaptive immunity
  - d. learned immunity
10. Which disease is caused by bacteria?
  - a. Covid-19
  - b. Dengue
  - c. Hepatitis
  - d. Typhoid
11. Lines of defences are of:
  - a. 2 types
  - b. 3 types
  - c. 4 types
  - d. 5 types
12. First two lines of defences are included
  - a. Innate immunity
  - b. Adoptive immunity
  - c. Passive immunity
  - d. None of these
13. It is most effective and long term protection
  - a. Innate immunity
  - b. Adoptive immunity
  - c. Passive immunity
  - d. None of these
14. It is temporary protection
  - a. Innate immunity
  - b. Adoptive immunity
  - c. Passive immunity
  - d. None of these
15. When the skin is damaged, bacteria enter our body. Which line of defence is crossed these bacteria?
  - a. First line of defence
  - b. Second line of defence
  - c. Third line of defence
  - d. Fourth line of defence
16. A new born baby has less immunity as compared to other people. The baby has only
  - a. innate immunity
  - b. Adaptive immunity
  - c. Passive immunity
  - d. Innate and natural passive immunity
17. The Army of your body has special bullets which can identify the enemy and kill them. These bullets are small proteins called:
  - a. Pathogens
  - b. Antibodies
  - c. Virus
  - d. Bacteria
18. Third line of defence learns about the enemy and adapts accordingly. It is also called
  - a. adaptive/ learned immunity
  - b. innate immunity

- c. passive immunity  
d. natural passive immunity
19. Banish is allergic to dust and pollen. Her Health issue is a/an  
a. infectious disease  
b. disease due to pathogen  
c. viral attack  
d. non infectious disease
20. Rabies is a very serious threat to health and life of a person. If a rabies infected dog bites a person, the only way to save him is by providing  
a. innate immunity  
b. adaptive immunity  
c. passive immunity  
d. learned immunity
21. Maximum number of additional defence layers is required for  
a. medical staff b. teachers  
c. students d. lawyers
22. Typhoid and polio spread by faecal oral route. If we want to prevent such diseases in our area we should  
a. control mosquitoes  
b. control air pollution  
c. improve hospitals  
d. improve sanitation and hygiene condition.
23. Respiratory system related disease mostly spread through  
a. water b. food  
c. blood d. droplets in air
24. Which of these can provide you with long term immunity against infectious diseases?  
a. Antibiotics b. Vitamins  
c. Vaccines d. Red blood cells
25. Vaccination can prevent:  
a. Typhoid b. Hepatitis-B  
c. Dengue d. Both a & b

### Solution: Section - A (MCQs)

#### Solution:

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. d  | 2. d  | 3. b  | 4. b  | 5. b  |
| 6. c  | 7. a  | 8. d  | 9. a  | 10. d |
| 11. b | 12. a | 13. b | 14. c | 15. a |

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 16. a | 17. b | 18. a | 19. d | 20. c |
| 21. a | 22. d | 23. d | 24. c | 25. d |

### Section - B

### Fill in the Blanks

Time: 10 Minutes

Total Marks: 15

#### Q 1. Fill in the blanks.

- The ability of human body to defend itself against disease causing agents (pathogens) is called \_\_\_\_\_.
- The response of human body to a foreign particle (pathogen) in the form of producing antibodies against a specific antigen is called \_\_\_\_\_.
- The \_\_\_\_\_ is inherited from parents and protects the individual since birth. It is always present in the body and generates a rapid response.
- The immunity acquired by an individual after the birth is called \_\_\_\_\_. It is developed in response to external factors.
- \_\_\_\_\_ is a type of adaptive (acquired) immunity by which a body produces its own antibodies in response to the pathogens entered in the body.
- \_\_\_\_\_ is a type of adaptive (acquired) immunity by which readymade antibodies are transferred to the individual.
- Viruses, bacteria, fungi and other parasites are the \_\_\_\_\_ causing infectious diseases.
- Hepatitis, typhoid, COVID-19, etc., are the examples of \_\_\_\_\_.
- COVID-19 is caused by \_\_\_\_\_.
- Typhoid is caused by \_\_\_\_\_.

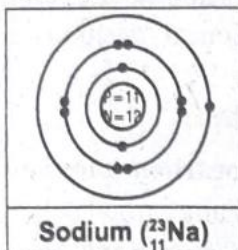
#### Q 1. Solution:

|                    |                        |
|--------------------|------------------------|
| 1. immunity        | 2. immune response     |
| 3. innate immunity | 4. adaptive immunity   |
| 5. Active immunity | 6. passive immunity    |
| 7. pathogens       | 8. infectious diseases |

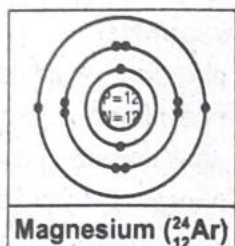
- b. (i) Draw the atomic structures of sodium and magnesium having atomic number 11 and 12 respectively.

Ans:

Sodium ( $Z = 11, A = 23$ )



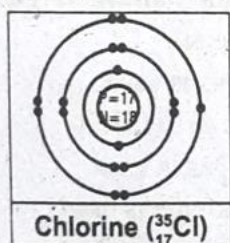
Magnesium ( $Z = 12, A = 24$ )



- (ii) Draw the atomic structures of chlorine and argon having atomic number 17 and 18.

Ans:

Chlorine ( $Z = 17, A = 35$ )



Argon ( $Z = 18, A = 40$ )



## Unit # 5 Physical and Chemical Changes

### Model Paper # 9

#### Section - A

#### Multiple Choice Questions

Time: 20 Minutes

Total Marks: 30

- Three of the following are alike. Select the one that is different from the others.
  - Solubility
  - Conductance
  - Oxidation
  - Boiling of a substance
- A physical change occurs when:
  - Iron rusts.
  - Solution of common salt is heated.
  - A piece of wood burns.
  - Sugar is heated strongly.
- A gas produced on heating solid potassium chlorate is:
  - Hydrogen
  - Carbon dioxide
  - Methane
  - Oxygen
- Select all that happen during a chemical change.
  - A temporary change occurs.
  - Composition of the substances is changed.
  - Properties of the substances are changed.
  - New substances with different properties are formed.
- Freezing of a liquid is a:
  - chemical change.
  - chemical property.
  - physical change.
  - None of above.
- What are the products when electric current is passed through water?
  - only steam
  - hydrogen and steam
  - hydrogen and oxygen
  - oxygen and steam

ent types of solutions.

| State of solute | State of solvent | Examples of solution                                                                                      |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------|
| Solid           | Liquid           | 1. Salt solution (salt dissolved in water)<br>2. Amalgam (tin, gold or copper dissolved in mercury)       |
| Liquid          | Liquid           | Alcoholic drinks (alcohol dissolved in water)                                                             |
| Gas             | Liquid           | 1. Fizzy drinks (carbon dioxide dissolved in water)<br>2. Sea and river water (oxygen dissolved in water) |
| Gas             | Gas              | Air (oxygen, carbon dioxide, noble gases dissolved in nitrogen)                                           |
| Solid           | Solid            | 1. Brass (zinc dissolved in copper)<br>2. Bronze (tin dissolved in copper)                                |

### 8. Define unsaturated solution.

**Ans: Unsaturated Solution:**

If 5 g salt is added to 500 cm<sup>3</sup> of water in a beaker and stirred, it will dissolve in the water. If some more salt is added to this solution, it will also be dissolved. *Such a solution to which further amount of the solute can also be dissolved at a particular temperature is called unsaturated solution.*

### 9. Define saturated solution. How is a saturated solution prepared?

**Ans: Saturated Solution:**

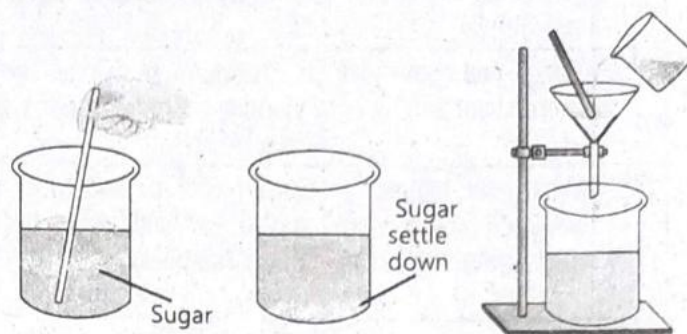
If some salt is added to 500 cm<sup>3</sup> of water in a beaker and stirred, it will dissolve in water. If more salt is added to the solution and stirred, there will be a time when the salt will not dissolve anymore. *Such a solution to which no more solute can be dissolved at a particular temperature is called a saturated solution.* If more solute is added at the same temperature, the excess remains undissolved at the bottom of the container.

### 10. How will you perform an activity to make a saturated solution of sugar?

**Ans: Activity:**

Take 100g of water in a beaker. Add half tea-spoon full of sugar and stir. Keep on adding sugar and stirring until the sugar starts settling down at the bottom of the beaker. Filter the solution in another beaker. Keep it at room temperature. This solution is

called saturated solution of sugar at room temperature.



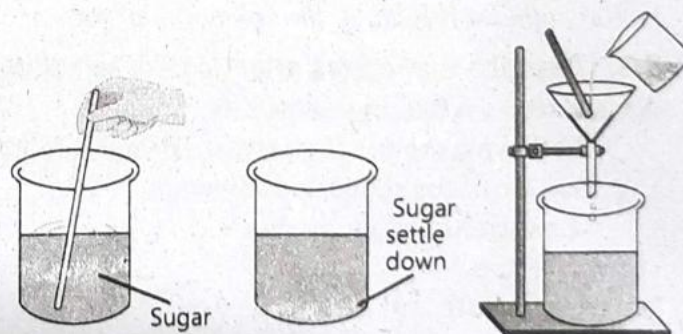
| Q. No. | Inquiry                                                         | Reply                                                                 |
|--------|-----------------------------------------------------------------|-----------------------------------------------------------------------|
| 1      | What type of solution is this at room temperature?              | This is a saturated solution of sugar at room temperature.            |
| 2      | Can you dissolve more sugar in it?                              | If temperature does not change, no more sugar will dissolve into it.  |
| 3      | What will happen if you add some more sugar into this solution? | Sugar will remain undissolved and settle at the bottom of the beaker. |

## Section - C (Long Questions)

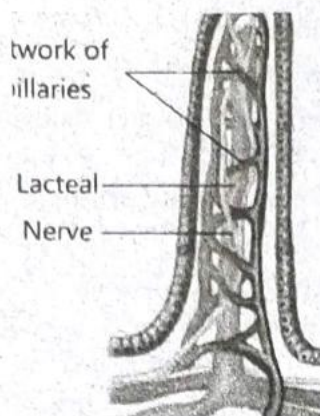
### Q 1. How will you perform an activity to make a saturated solution of sugar?

**Ans: Activity:**

Take 100g of water in a beaker. Add half tea-spoon full of sugar and stir. Keep on adding sugar and stirring until the sugar starts settling down at the bottom of the beaker. Filter the solution in another beaker. Keep it at room temperature. This solution is called saturated solution of sugar at room temperature.



| Q. No. | Inquiry | Reply |
|--------|---------|-------|
|--------|---------|-------|



Villus

**Q 6. a** How is large intestine important in digestive system of man?

**Ans:** Large Intestine:

Some water and mineral salts are absorbed into the blood through the walls of the large intestine. The remaining wastes move into the rectum as faeces which are expelled out through the anus.

**b** Which parts of the body secrete digestive glands?

**Ans:** Digestive Glands:

*Glands* are special structures in living bodies which are concerned with secretion of specific substances in the body. *Salivary glands, gastric glands, liver and pancreas* are the digestive glands.

*Salivary glands* secrete a liquid called saliva in the oral cavity. *Saliva* contains *enzymes* which speed up the digestion process in oral cavity. *Gastric glands* secrete *gastric juice* in stomach.

## Model Paper # 8

### Section - A

### Multiple Choice Questions

Time: 20 Minutes

Total Marks: 20

1. The digestive juices are produced in:

- a. Mouth
- b. Oesophagus
- c. Stomach
- d. Small intestine

2. The digestive juices starts digestion of:
  - a. Fats
  - b. Carbohydrates
  - c. Proteins
  - d. All of these
3. The food remains in stomach for:
  - a. 1 hour
  - b. 2 hour
  - c. 4 hours
  - d. 6 hours
4. Hydrochloric acid present in digestive juice in the stomach:
  - a. Kills germs present in the food
  - b. Helps in digestion of protein
  - c. Helps in the digestion of carbohydrates
  - d. Both (a) & (b)
5. As food leaves our stomach, it enters into:
  - a. Oesophagus
  - b. Large intestine
  - c. Small intestine
  - d. Rectum
6. Final digestion of carbohydrates, fats and proteins occurs in the:
  - a. Stomach
  - b. Small intestine
  - c. Large intestine
  - d. Oesophagus
7. It provides bile salts to make fats easier to absorb:
  - a. Stomach
  - b. Pancreas
  - c. Liver
  - d. Oesophagus
8. Villi, finger like structures that absorb the digested food are present in:
  - a. Large intestine
  - b. Small intestine
  - c. Stomach
  - d. Liver
9. The main job of large intestine is:
  - a. To digest fats
  - b. To digest carbohydrates
  - c. To absorb extra water
  - d. To digest protein
10. Vomiting is the reverse process of:
  - a. Hydration
  - b. Peristalsis
  - c. Hydrolysis
  - d. Paralysis
11. It is cause/causes of diarrhoea:
  - a. Anxiety or excitement
  - b. Contaminated food or infection
  - c. Contaminated food or reaction of some medicine
  - d. All of these
12. Lemonade contains:
  - a. Carbohydrates
  - b. Protein
  - c. Sugar and salt
  - d. Fats

losing the kinetic energy to friction energy and potential energy. So after a while it will come to a rest position.

**8. Investigate the examples of energy conversions on your way home from school by a bicycle.**

Ans: When we pedal the bicycle, our body is using the energy. We got this energy from the chemical energy of our food, breakdown of the food we eat. Our body energy is converted into mechanical energy, while moving the pedals. This mechanical energy is converted into kinetic energy, when the cycle moves. So bicycle turns energy created by our body into kinetic energy.

**9. Describe the advantages of using renewable energy resources.**

Ans: Advantages of using renewable energy sources:

Renewable energy sources are available free of cost and they don't produce pollution while using them for generating electricity. Solar energy is an everlasting source of energy. Plants use it to make food. It maintains the temperature of our planet (the Earth) suitable for survival of life on it. We can use it to generate electricity through solar panels.

Flowing water in rivers and wind in the coastal areas are free of cost sources of kinetic energy that can be converted into electricity using turbines, windmills and electric generators.

**10. Sound is a form of energy. How does sound travel?**

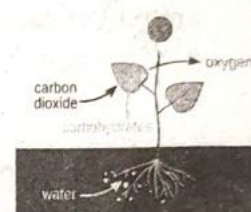
Ans: Sound travels in waves and can be sensed with our ears. It needs medium to travel through. It cannot travel through vacuum. It travels fast through solids and liquids as compared to air. The speed of sound in water is almost 5 times greater than in air and about 15 times greater in solid objects than air.

**Section - C (Long Questions)**

**Q 1. a Define energy. What is the use of energy?**

Ans: The ability to do work is called energy. For doing every work, we need energy. What makes us

move? What makes the car run? What makes the food cook? What makes the plants prepare food? What makes the bulb glow? What is produced from beating a drum? The answer to all these questions is energy (Figure).



*Different forms of energy*

**b Name the major forms of energy.**

Ans: Heat, light, sound, electricity, mechanical energy, chemical energy, nuclear energy, etc., are different forms of energy. All these forms of energy can be put into two main categories, i.e., Potential Energy (P.E.) and Kinetic Energy (K.E.).

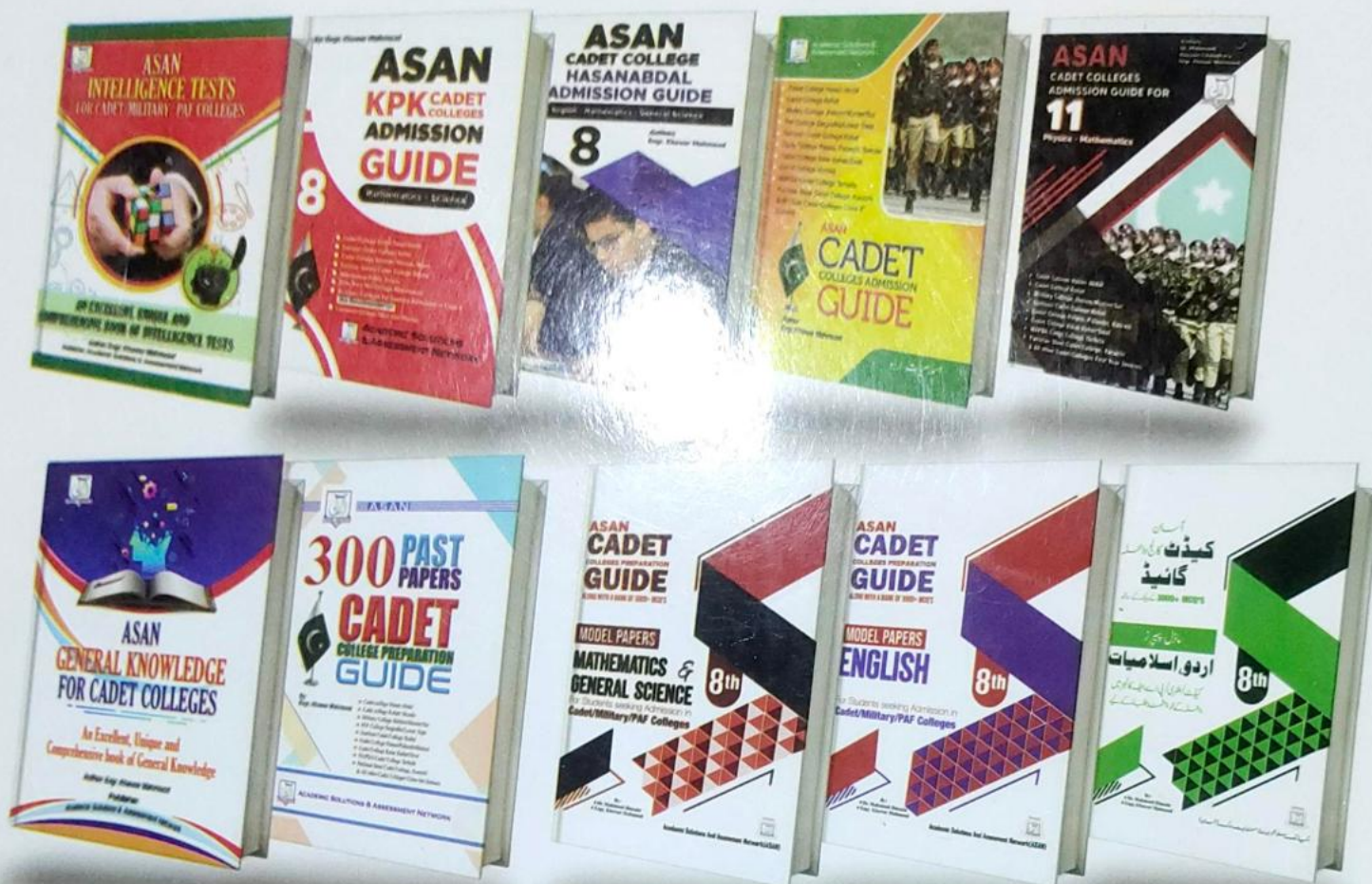
**Q 2. a Define the following:**

- a. Energy
- b. Kinetic energy
- c. Potential Energy
- d. Energy Converter
- e. Solar Panel

Ans:

- a. **Energy**  
Ability to do work is called energy.
- b. **Kinetic energy**  
Energy due to motion of an object is called kinetic energy.
- c. **Potential Energy**  
Energy due to position of an object is called potential energy.
- d. **Energy Converter**  
A device which converts one form of energy into another is called energy converter.
- e. **Solar Panel**

## Our Featured Products



Available @

**Kashmir Book Depot**

URDU BAZAR RAWALPINDI  
051-5558321, 051-5542877

**United Book Sellers**

URDU BAZAR KARACHI  
021-32636194

**AHSAN PAPER MART**

ASGHAR PLAZA  
COLLEGE ROAD  
RAWALPINDI  
051 5559697

**Al Khair Books**

ARCHER ROAD QUETTA  
081 2849176

**Academic Solutions & Assessment Network**

Office # 4, Aiwan-e-ilm Plaza, Urdu Bazar, Lahore, Pakistan.

+92-42-37235427, +92-323-8001161, +92-300-9386720.

www.asanbooks.com info@asanbooks.com



Follow Us  
@asanbooks

Rs. 1000/=

