

GSA- Mook JAN 2026

PART-2 (Section-A)

Q4:

a. Explain the role of heart and blood vessels in ~~cuxxulation~~ circulation.

The heart and blood vessels work together in the circulatory system to transport blood throughout the body.

Heart:

The heart is a muscular pump that propels blood through the circulatory system. It has four chambers (right atrium, right ventricle, left atrium, left ventricle) that receive and push blood in two main circuits:-

• Pulmonary circuit: The right side sends deoxygenated blood to the lungs to pick up oxygen and release carbon dioxide.

• Systemic circuit: The left side pumps oxygenated blood to body's tissues and organs.

Blood vessels:

These are the channels through which blood flows. They are divided into three types:-

• Arteries:-

Carry blood away from the heart. They have thick, elastic walls to handle high pressure.

Veins: Return blood to the heart (oxygen-poor, except pulmonary vein). They have valves to prevent back-flow.

Capillaries: tiny vessels that connect arteries to veins, allowing exchange of oxygen, nutrients and waste products between blood and tissues.

Together, the heart's pumping action and the blood vessel network ensure continuous circulation, delivering essential substances to cells and removing metabolic waste.

b) what is cyclone? Describe the formation of cyclone.

CYCLONE: A cyclone is a large-scale atmospheric system characterized by low atmospheric pressure at its center and rotating winds that spiral inward toward the low-pressure area. In the Northern Hemisphere, the winds rotate counterclockwise, while in the Southern Hemisphere they rotate clockwise due to the Coriolis effect.

FORMATION OF CYCLONE:

Warm, moist air rises:-

Over warm ocean waters, moist air heats up and ascends creating an area of low pressure near the surface.

• Low pressure intensifier: As the air rises, it cools and condenses, releasing latent heat, which further fuels the upward motion and deepens the low pressure.

• Air spirals inward: Surrounding higher-pressure air moves toward the low-pressure zone. The Coriolis force deflects this moving air, causing it to rotate around the center.

c) Enlist the functions of the following:-

Carbohydrates: Provide the body's primary source of energy; broken down into glucose to fuel cells, especially the brain and muscles.

Proteins: Build and repair tissues (muscles, organs, skin); form enzymes, hormones, and antibodies; involved in cellular processes and immune defense.

Fats: Supply concentrated energy and essential fatty acids; aid absorption of fat-soluble vitamins (A, D, E, K); provide insulation and protect organs.

Calcium: Essential for bone and teeth formation; required for muscle contraction, nerve transmission and blood clotting.

Iron: Crucial for hemoglobin synthesis, enabling oxygen transport in red

blood cells; involved in energy metabolism and cellular respiration.

Q How remote sensing can be employed for environmental purpose?

Remote sensing can be employed for environmental purposes in several key ways:-

- Landcover and land use mapping:- satellite or aerial imagery helps monitor changes in vegetation, urban expansion, and deforestation enabling sustainable land management.

- Environmental monitoring:- Sensors detect changes in water quality, air pollution and soil conditions providing data for pollution control and resource management.

- Disaster management:- Remote sensing aids in assessing natural disasters like floods, wild fires or landslides, supporting emergency response and damage evaluation.

Q3:

(a) How global warming can be reversed?
Reversing global warming involves reducing atmospheric greenhouse gases and enhancing natural carbon sinks.

Key strategies include:

↳ Transitioning to renewable energy (solar, wind, hydro).

↳ Improving energy efficiency in industries and transport.

↳ Reforestation and afforestation to absorb CO_2 .

↳ Adopting sustainable agriculture and reducing methane emissions.

↳ Implementing carbon capture and storage technologies.

(b) **Ceramics:** Ceramics are inorganic, non-metallic solids made by heating natural raw materials to high temperatures.

Properties:-

- High hardness.
- Brittleness
- Heat resistance.
- Electrical insulation.
- Chemical stability.

Applications:-
batteries,
cutting tools
engine components
Biomedical implants
electronic substrates

(C) Optic fiber:

A thin glass or plastic strand that transmits data as light pulses via total internal reflection. The core guides light, while the cladding reflects it, enabling high-speed, low-loss communication over long distances.

Mobile phone A portable device that converts voice/data into radio waves for transmission. It contains a processor, antenna, display and battery. When you speak, the microphone converts sound to an electrical signal, which is digitized, modulated and sent via radio frequency to a cell tower; the process reverses for incoming calls/data.

(d)

Food additives: Substances added to food to enhance flavor, appearance or shelf life.

E.g.:- Monosodium glutamate for flavor
Lecithin as an emulsifier.

(PART B)

Q6
(a)

Ans- The woman is Ahsan's niece (the daughter of Ahsan's brother is his niece, so her granddaughter is Ahsan's grandniece, making the woman his niece.

(b) Ans- let length = $3x$ and breadth = $2x$
Perimeter = $2(3x + 2x) = 10x$
Speed $12 \text{ km/hr} = \frac{12 \times 1000 \text{ m/min}}{60} = 200 \text{ m/min}$.

Distance in 8 min = $200 \times 8 = 1600 \text{ m}$.

Thus $10x = 1600 \Rightarrow x = 160$

Area $3x \cdot 2x = 6x^2 = 6(160)^2 = 153600 \text{ sq.m}$.

(c) Ans- let the ten's digit be y , unit's digit be x .

$$x = y + 2$$

The no is $10y + x$

$$(10y + x)(x + y) = 144$$

Substituting $x = y + 2$

$$(10y + y + 2)(y + 2 + y) = 144$$

$$(11y + 2)(2y + 2) = 144$$

Solving

$$22y^2 + 22y + 4y + 4 = 144$$

$$22y^2 + 26y - 140 = 0$$

$$y = 2 \text{ (valid digit)}$$

$$x = 4$$

$$\text{Number} = 10(2) + 4 = 24$$

(d) Ans- let the num be $2k$ and $3k$.

$$\text{LCM}(2k, 3k) = 6k = 48 \Rightarrow k = 8$$

Num are 16 and 24. Sum = $16 + 24 = 40$.

Q7-
 (a) Let the first number be x and the second number be y . Given.

$$40\% \text{ of } x = \frac{2y}{3}$$

$$0.4x = \frac{2y}{3}$$

Solving for the ratio $\frac{x}{y}$

$$\frac{x}{y} = \frac{2}{3 \times 0.4}$$

$$= 2$$

$$1:2$$

$$= \frac{5}{3}$$

b) Let the cost price of one ball be c .
 Given selling price of 17 balls = 720
 Loss = cost price of 5 balls

Thus,

cost price of 17 balls - selling price of 7 balls

$$= 5c$$

$$17c - 720 = 5c$$

$$12c = 720$$

$$c = 60$$

c) Let the present age of man be x . Then the man's age is $x + 24$ in 24 years.

$$(x + 24 + 2) = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$x = 22$$