Section-B

Q.6

(A)

Pointing to a woman, Ahsan said, "Her granddaughter is the only daughter of my brother." How is the woman related to Ahsan?

Ahsan pointed to a woman. She is grandmother of Ahsan's only daughter. Therefore, the woman is mother of Ahsan or mother of sister-in-law of Ahsan.

Answer: Mother of Ahsan or mother of sister-in-law of Ahsan.

(B)

The ratio between the length and the breadth of a rectangular park is 3:2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then the area of the park (in sq.m) is?

Man completed one round of rectangular park at the speed of 12 km/hr in 8 minutes. By using formula of distance (distance = speed & time), he covers 1600m in 8 minutes. As the

length and breadth of rectangular park has ratio of 3:2. Therefore, the length and the breadth of rectangular park are 480m and 320m respectively. And by applying the formula of area. The area of rectangular park is 153600 sq.m.

Answer: Area of rectangular park is 153600 sq.m.

(C)

In a two digit number, if it is known that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and sum of its digits is equal to 144, then the number is?

The two digit number, such that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and sum of its digits is equal to 144 is 24.

Answer: Two digit number is 24.

(D)

The L.C.M of two numbers is 48. The numbers are in the ratio of 2:3. Then the sum of the numbers is?

The common multiplier of two numbers can be taken as n. The LCM will be (ie) $2n \times 3n = 6n$. As it is given LCM = 48. Therefore, n will be (i.e $6n = 48 \Rightarrow n = 8$). By multiplying n with 2 and 3, we get 16 and 24 respectively. By adding 16 and 24, we get

Answer: The sum of the numbers is 40

Q.7

(A)

If 40% of a number is equal to two third of another number, what is the ratio of first number to the second?

If 40% of a number is equal to two third of another number, then the ratio of first number to the second is equal to 5 : 3

i.e $\frac{2}{5}\frac{40}{100}(x) = \frac{2}{3}(y)$

$$\frac{2x}{5} = \frac{2}{3}(y)$$

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

Answer: Ratio of first number to the second is equal to 5 : 3

(B)

On selling 17 balls at Rs 720, there is loss equal to the cost price of 5 balls. The cost price of a ball is?

Let x be the cost price per ball. Since the loss on 17 balls equals cost price of 5 balls, selling price of Rs 720 effectively covers the costs of 12 balls (17-5=12). Dividing Rs 720 by 12 equals 60.

Answer: cost price of a ball is Rs 60.

(C)

A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of son is?

Let the son's present age be x. The man's age is x+24. In two years, the relationship (x+24)+2 = 2(x+2) simplifies to x+26 = 2x+4, which solves to x = 22

Answer: The present age of son is 22 years.

(12)

Rashid and Kamran are working on an assignment. Rashid takes 6 hours to type 32 pages on a computer, while Kamran takes 5 hours to type 40 pages. How much time will they take, working together on two different computers to type an assignment of 110 pages?

Rashid types at ~~16 pages per 3 minutes~~ 16/3 pages per hour and Kamran at 8 pages per hour, creating a combined rate of 40/3 pages per hour. To type 110 pages, they will need $110 \div (40/3) = 8.25$ hours, which is 8 hours and 15 minutes

Answer: 8 hours and 15 minutes.

Section (A)

Q. 40.4

(a)

Explain the role of heart and blood vessel in circulation.

Cardic Propulsion Mechanism

1) Dual Pump Functionality

The heart operates as a muscular pump divided into four chambers to facilitate two distinct circuits. In 2026, medical standards define the right side as the pulmonary pump for gas exchange and left side as the systemic pump for nutrient delivery

2) Cardiac Cycle Phases

Circulation is driven by the rhythmic alternation b/w systole and diastole. This cycle ensures that blood is pressurized and ejected into the vascular tree before the heart refills, maintaining continuous perfusion to vital organs.

3) Unidirectional Flow Control

Four internal heart valves open and close in response to pressure changes to prevent the backflow of blood. This mechanism regulation ensures that every heartbeat moves the blood volume forward, maximizing efficiency of circulatory loop.

Vascular Infrastructure Roles

1) High Pressure Distribution

Arteries serve as the primary conduits for carrying oxygenated blood away from the heart at high velocities. Their thick, elastic walls are designed to withstand and dampen the peak pressures generated during ventricular contraction, protecting distal tissues.

2) Micro-vascular Nutrient Exchange

Capillaries are the functional sites of the circulatory system where oxygen and carbon dioxide are exchanged. Their thin, semi-permeable walls allow for the diffusion of essential molecules between bloodstream and interstitial fluid surrounding body cells.

3) Low Pressure Collection

Veins return deoxygenated blood to the heart using a system of one way valves and skeletal muscle assistance. This collection network operates under low pressure, reclaiming blood from extremities to restart oxygenation process in the lungs.

Systemic Regulatory Integration

1) Pulmonary and Systemic Loops

The heart and vessels coordinate two simultaneous loops to ensure blood is both oxygenated and distributed. In 2026, this synchronized activity is recognized as the foundation of aerobic metabolism and the removal of cellular waste products.

2) Hemodynamic Pressure Maintenance

Blood pressure is maintained through interplay of cardiac output and vascular resistance. Proper regulation of this pressure is critically for preventing vessel damages a primary goal of resources like American Heart Association

3) Homeostatic Response Management

The circulatory system adjusts heart rate and vessel diameter to regulate body temperature and hormone transport. This dynamic responsiveness allows the body to adapt physical stress or environmental change while maintaining internal stability.

(b)

What is cyclone? Describe the formation of cyclone.

Meteorological Definition and Characteristics

1) Atmospheric vortex structure

A cyclone is a large scale system of air that rotates around a center of low atmospheric pressure. In 2026, meterologist define these system by their inward spiraling winds that rotates counterclockwise in Northern hemisphere and clockwise in southern hemisphere

2) Classification and Terminology

The term encompasses various systems including tropical cyclones, extratropical cyclones and tornadoes, depending on their location and intensity.

3) Core Physical Properties

The core of a cyclone is the eye, a calm, low pressure center. The intense pressure gradient between this center and its surroundings drive the high speed winds

Atmospheric Formation Requirements

1) Thermal Energy Thresholds

Sea surface temperatures must reach at least 26.5°C to provide the latent heat and moisture needed for rising air columns.

2) Coriolis Effect Necessity

Earth rotation must be strong enough to initiate spinning. This limits formation to regions atleast 5°C latitude from the equator.

3) Vertical Wind Shear Conditions

Minimal change in wind speed/direction with altitude is required to keep storm's vertical structure intact

Stages of Cyclogenesis

Tropical Disturbance Initiation

A cluster of thunderstorms where rising warm air condenses releasing latent heat.

Depression and Intensification

~~Intense~~ The system organizes into a tropical depression, then a tropical storm as central pressure drops and rotation increases.

Mature Cyclone Maintenance

A defined eye develops. In line with 2026 safety protocols, these systems are tracked via satellite for landfall predictions.

(b)

How remote sensing can be employed for environmental purposes?

Terrestrial Ecosystem Monitoring

1) Deforestation and land cover Analysis

Satellites in 2026 use multispectral sensors to track deforestation and crop health via NDVI. This enables real time conversation of forests and precise management of resources.

2) Agricultural stress Detection

Thermal sensors detect heat anomalies to identifies fire fronts and predict spread directions. This data is critical for 2026 emergency response and assessing ecological damage for restoration.

3) Wildlife Risk and Mapping.

Resources like NASA Earthdata provide high-resolution imagery to monitor urban sprawl. This helps planners protect wildlife habitats and manage land use changes effectively.

Aquatic and Atmospheric Assessment

1) Marine Pollution Tracking

Satellite based spectrometers identify industrial methane and CO_2 super emitters to enforce 2026 climate standards. This tracks the movement of pollutants across international borders for air quality mangement

2) Air Quality and Emission Monitoring

Remote sensing identifies oil spills and algal blooms by analyzing spectral changes in ocean water which can help protect marine biodiversity.

3) Glacial and Ice Sheet Observation

Radar altimetry monitors thinning of polar ice sheets which can help for predicting sea level rise.

Disaster Management and Urban Planning

1) Flood Mapping and Prediction

Synthetic Aperature Radar maps flood extents through clouds to assist 2026 rescue operations which help to predict high risk disaster zones.

2) Urban Heat Island Mitigation

Thermal imaging identifies heat islands which used to implement green corridors.

3) Natural Resource Exploration

Sensors monitor soil moisture and groundwater levels to issue early warning to suitably allocate water.