

Part IISection AQuestion no 2

a.

Ans:- Circulatory system: The circulatory system is made of vessels and muscles that help to control the flow of blood around body. This process is called circulation. The main parts of the system are the heart and blood vessels.

Role of human heart in circulation.

Human heart is muscular organ that pumps blood through the body. Everyday, the heart pumps about 2,000 gallons of blood, beats for 100,000 times. It.

Structure of human heart.

The human heart has four chambers. The right and left atria are receiving chambers for blood. The atria are also called auricles. The heart's lower ^{two} chambers are pumping chambers right and left ventricles. The ventricles propel blood into arteries. A septum separates the left and

right side of heart.

Working of human heart in blood circulation

Blood returning from a trip around the body has given up most of its oxygen and picked up carbon dioxide from body's tissues. The oxygen poor blood feeds into two large veins, the superior vena cava and inferior vena cava, which empty into right atrium of heart. The right atrium conducts blood to the left right ventricle and right ventricle conducts into the pulmonary artery. The pulmonary artery carries the blood to the lungs where it picks up the fresh supply oxygen and eliminates CO_2 . Now oxygen rich blood returns to the heart by pulmonary veins, which empty into the left atrium. Blood vessels ^{passes} from left atrium into left ventricle, from where it is pumped out of heart into aorta, ~~to~~ smaller arteries that branch

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to the whole body.

Q/d)

Ans:- Liver

Humans have five vital organs that are essential for survival. These are brain, heart, kidneys, liver and lungs.

The liver is an abdominal glandular organ in the digestive system. It is located in the right upper quadrant of abdomen, under diaphragm.

Function of liver

The liver has complex role in function of body. Detoxification, metabolism, hormone regulation, digestion, and decomposition of red blood cells to a. It produces bile, a chemical substance that breaks down fats and make them more easily digestible.

The liver also synthesizes important elements of plasma, and stores some vital nutrients

including vitamins (A, D, E, K and B)

It also stores simple glucose and converts it to usable glucose if blood sugar level falls in body. One of the best role of liver is a detoxification system. It removes toxic substances from blood such as alcohol, and drugs. It breaks haemoglobin, insulin and excessive hormones to keep hormone level in balance.

Question no 3

a)

Ans. Kidney

The kidney are dark-red, slightly flattened, bean-shaped organs about 10cm long, 5cm wide and 4cm thick and each weighing about 270g. They are placed against the back wall of abdominal cavity just below diaphragm.

Nephron Function

The main function of nephron are related to filtering, reabsorbing

secreting - glutamate carbohydrates and solutes. The glomerulus has two cell layers as well as basement membrane that separates it from Bowman's capsule. This basement membrane contains collagen and glycoprotein fibres. These fibres have a meshlike structures that uses ultra filtration to filter the blood. Although smaller molecules in blood are able to pass through this membrane larger molecules such as blood cells and proteins cannot. This process removes the substances including amino acids and glucose but selective reabsorption allows the body to reabsorb them and keep the electrolyte levels balanced.

After the fluid is filtered, it goes into proximal tubule where it is reabsorbed into the peritubular capillaries.

This is the point at which any essential substances get

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transported back to blood. The numerous microvilli increase the surface area making absorption more effective. While, the substances are re-added the solute concentration found of the blood in these capillaries increases. This means that great deal of water must go back into blood while in proximal tubule using osmosis as this will balance electrolyte levels.

The loop of henle concentrates the salts - The limbs of Loop of henle are able to reabsorb the certain solutes, water, and ions. These substances are reabsorbed from area in collecting ducts. The ascending limb is permeable to salts than water so during absorption of salts, more water exists the descending limb which in turn creates concentrated urine -

d)

Ans. Food preservation methods

1) Drying: Micro-organisms in healthy growing state may contain in excess of 80% water. If the water is removed from the bacterial cell then multiplication will stop.

2) Cold → Most bacteria, yeasts and molds grow best in temperature range $16-30^{\circ}\text{C}$. At temperature below 10°C however growth will slow. But when water is ^{not} completely frozen

In air foods - This is due to dissolved sugars, salts and other constituents.

3) Heat: Most bacteria, yeast, molds grow best in temperature range of about 16 to 38°C - Most bacteria are killed in the range $82-93^{\circ}\text{C}$ but many bacteria spores are not destroyed even by boiling water at 100°C - so temperature of 121°C must be maintained for 15 min.

Question no 3

a)

Ans. Artificial Intelligence

Artificial intelligence has impacted numerous aspects of world.

1) Automation: Artificial intelligence has revolutionized automation in industries such as manufacturing, logistics, and transportation.

2) Healthcare: It has transformed the healthcare sector by improving diagnoses, drug discovery, and medicine.

3) Finance: It has revolutionized financial industry by enabling faster and more accurate data analysis, fraud detection and algorithmic trading.

4) Transportation: It has impacted transportation particularly with the development of self-driving cars. Sensors to perceive environment, make decisions and navigate autonomously, protecting road safety.

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b).

Ans: Water scarcity is a pressing global issue, and addressing it requires a combination of short term and long term measures. Here are few measures to deal with water scarcity.

1) Water conservation: Encourage water conservation practices at both individual and community levels promote awareness campaigns.

2) Improved irrigation techniques:

Enhance agricultural practices for treating and reusing waste water for non-potable purposes such as irrigation and industrial processes, and toilet flushing.

4) Rainwater harvesting: Encourage the adoption of rainwater harvesting systems at individual, community and institutional levels.

5) Desalination technique: Desalination can provide a reliable source

Question no 4

s: Avalanche An avalanche is rapid flow of snow, ice and debris down a mountainside or slope. It is natural disaster that poses threat to human life, infrastructure and environment.

Examples

Mount Everest Avalanche (2014):

In April 2014, an avalanche struck the Khumbu Icefall on Mount Everest resulting in deadliest incident in mountain's history. Sixteen Nepalese guides lost their lives in this incident.

Tunnel Creek Avalanche (2012):

In Feb 2012, an avalanche occurred in Stevens Pass ski area in USA. The avalanche buried and killed three skiers in the Tunnel Creek backcountry area.

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Section B

Question no 6

①

Solution age of father five years ago = $(F - 5)$

Three times age of son = $3(S - 5)$

Age of son = 30 years

$$(F - 5) = 3(30 - 5)$$

$$F - 5 = 3(25)$$

$$F - 5 = 75$$

$$F = 75 + 5$$

$$F = 80 \text{ Ans}$$

So, Father age is 80 years old.

d)

Ans.

8, 4, 32, 7, 5

17, 19, 23, 29

Question 7

c)

Ans. IQ and EQ ∴ IQ refers

to the person's intellectual

or cognitive abilities as measured

by a standard test.

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EQ, on the other hand refers to emotional intelligence or emotional quotient. It represents person's ability to perceive, understand, manage and express emotions effectively. It involves skills such as self-awareness, relationship management.