

Part-II

Section-A

Q#2

(A)

Definition

Circulatory System

Def. It is a system which is involved in the transportation of nutrients in the body

Explanation

This system involve the circulation of blood in which various gases for instance oxygen and carbondioxide are exchanged.

This system comprises of a network of capillaries, vein and arteries.

Arteries: (1) carry oxygenated blood away from heart

(2) have high blood pressure

Veins: (1) carry blood toward heart (de oxygenated)

(2) have low blood pressure

Capillaries: (1) They are very small vessels

(2) carry both oxygenated and deoxysewated blood.

(3) No blood pressure

General Instructions

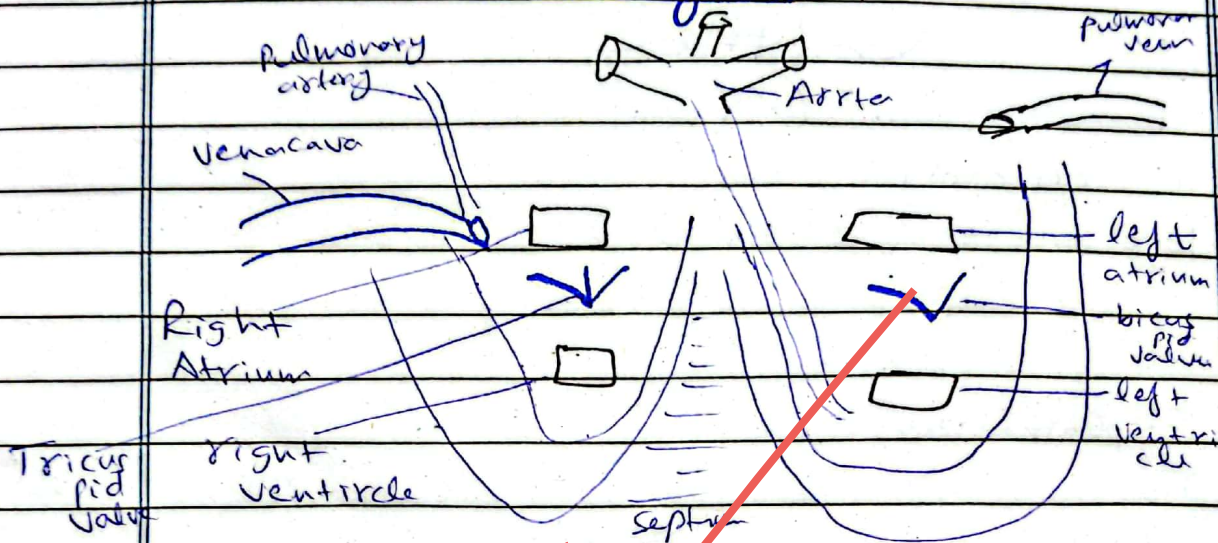
1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.
3. Do not use table for comparison and contrast questions.
4. Draw figures/diagram/flowchart where needed.
5. Start new question from fresh page.
6. Write unit of the answer in ability section.
7. Explain mathematical steps and the reasoning for better score.
8. Change colour scheme for references to give them more visibility.
9. Manage time well.
10. Wide page borders are discouraged. Should be reasonable.
11. Avoid writing wrong references.
12. Give more weightage to expressedly asked part/s of the question.

Human Heart

Location: in the middle of chest close to left side of body

Chamber: It has 4 chamber (2 Atrium and 2 Ventricle)

Diagram



How it works.

- ① Veins bring deoxygenated blood into Venacava (largest vein).
- ② From Venacava deoxygenated blood is pumped into Right atrium.
- ③ When right atrium contracts through tricuspid valve (prevent back flow of blood) deoxygenated blood is pumped into Left atrium ventricle.
- ④ When left ventricle contracts, the blood is pumped into Pulmonary Artery.
- ⑤ Pulmonary Artery takes that blood into lungs from where oxygenation process take place.
- ⑥ From lungs, Pulmonary vein bring oxygenated blood into Left Atrium.

- (A)
- ① when left atrium contract, the oxygenated blood through bicuspid valve is pumped into left ventricle
 - ② when left ventricle contract the blood is again pumped into Aorta (big artery)
 - ③ From Aorta, the arteries carries oxyg blood to other side of the body

From the aforementioned discussions, it can be said that heart plays a pivotal role as it carries ^{out} one of the most sophisticated function of the body

(B)

Carbohydrate

Def. carbohydrate are organic compound which contain carbon, hydrogen and oxygen.

→ They are main source of energy

→ It's empirical formula is $C_x(H_2O)_y$

Example: glucose, fructose, maltose, lactose are some of the example

Classification of carbohydrate

(1) Monosaccharide

Literal meaning

mono - one, saccharide - sugar unit

Def. They have only one sugar unit.

→ Simplest carbohydrate

Example: glucose, fructose

(2) oligosaccharide

Literal meaning: oligo - few
Saccharide - sugar

Def. When 2 or more monosaccharide unit combine together they form oligo-saccharide

Range: 2 - 7

When 2 monosaccharide combine disaccharide

When 3 monosaccharide combine trisaccharide etc.

Example: Sucrose, Lactose and Maltose

(3) Polysaccharide

Literal meaning: Poly - many
Saccharide - sugar.

Def. When many monosaccharide unit join together they form polysaccharide

Example: starch, glycogen etc.

Function of carbohydrate

- ① They are stored in the form of glycogen (energy reserve)
- ② used and are produce in kreb cycle
- ③ energy source for body
- ④ form structure of the body.

(D)

Liver

Liver is known as the chief chemist of the body as it performs vital function

① role in digestive system

Liver secrete bile and through bile duct, bile reaches small intestine. It emulsify and digest Fats.

② Involve in the process of detoxification of blood.

③ It detoxifies poisonous substance

④ It is involve in the synthesis of protein and lipid.

⑤ It is involve in the synthesis of urea

⑥ It store protein and carbohydrate



Water Pollution

Def. It is the contamination of water bodies due to human induced activities for instance, agriculture, industrialization, throwing of harmful metal into water bodies.

Types of water Pollution

① Physical water Pollution

It is associated with the

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Physical change in water bodies
For example: colour, smell, odour, taste changes.

Causes

- ① Industrial ^{untreated} waste spread or thrown into river.
- ② Agricultural waste and domestic waste thrown into water bodies.
- ③ oil spill is also an cause of such pollution.

② Biological water pollution

When tiny harmful micro organism are present in water body it makes biological water pollution.

Example: bacteria, viruses, etc.

Causes

- ① It can be due to untreated water which may lead to outbreak of cholera.
- ② Eutrophication is another cause.

③ Chemical water pollution

Def. when untreated chemical waste is thrown into water bodies it leads to chemical water waste.

Causes

- ① When heavy metal like Hg, Al, Si are thrown into water bodies. It leads to chemical water pollution.
- ② Fertilizer are another examples.

Q#4

(D)

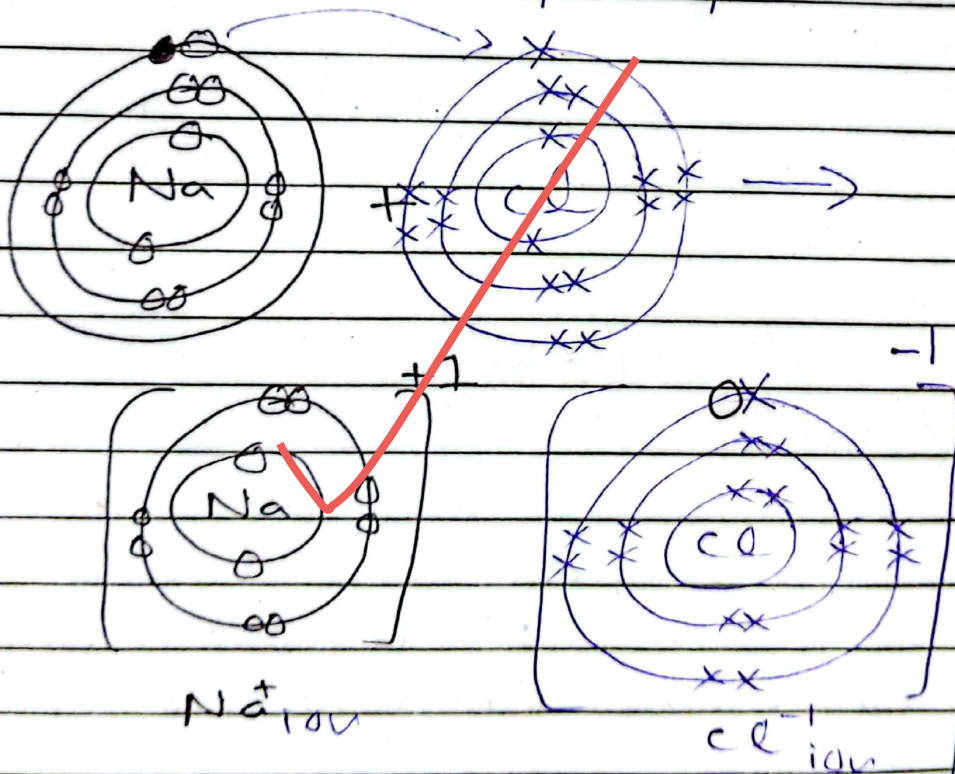
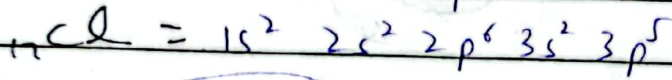
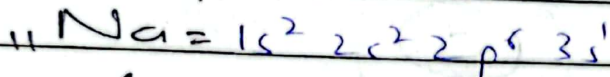
Ionic bond

Def. It is the complete transfer of electron from one atom into another.

→ The resulting (loss) atom become cation

→ while the gaining atom become Anion

Forexample



→ Na loses electron to complete its octet

→ Cl gain electron to complete its octet

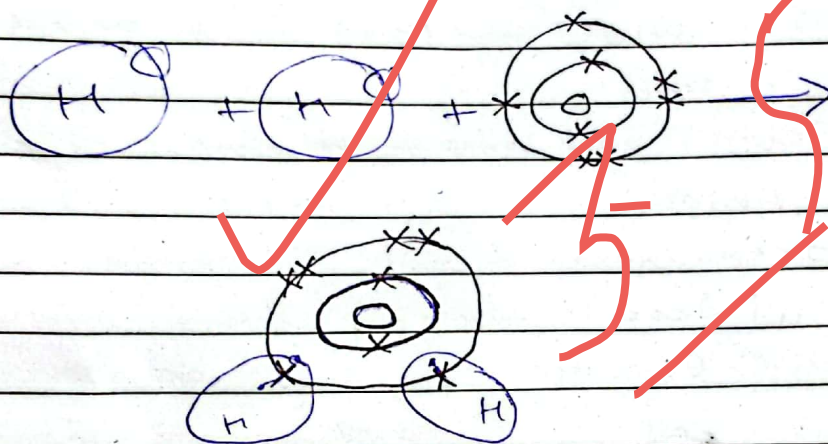
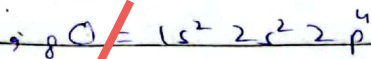
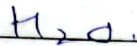
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Covalent bond

Def. It is formed due to the mutual sharing of a electron.

→ It is formed between non-metal

Example



- Hydrogen get its duplet complete
- while oxygen get to complete its octet.

(A)

Artificial Intelligence has taken the world by storm. It is bringing immense changes in our day to day. For instance Chat Gpt, robotics, deep fake, metaverse etc. All of these phenomena are revolutionizing the world.

Chat GPT: This AI tool is open hub of unlimited resource content.

which will bridge the knowledge gap difference and will provide answers to almost every question.

Robotics: AI generated robots and AI powered cars are becoming a new innovation in this process. For instance, Tesla is making AI car on deep learning tool.

Drones: AI powered weapons are now used in weapon systems. For example, self-automated drones have made this possible.

Metaverse: This is a new phenomenon. As meta means beyond, verse means universe. This AI tool aims to diversify our reality into 3 dimensions. Recently, Facebook has started work on it. It is using virtual and augmented reality to shape the incoming future.

Challenges

- ① will lead to redundancy in research
- ② Global AI arms race
- ③ AI will lead to massive unemployment
- ④ uncontrollable machine, which to extent we don't know.
- ⑤ will take ^{always} human decision making power

(B)

Water scarcity is making the future of humanity bleak in this good earth various nations are facing immense water scarcity for instance, Pakistan, Egypt, Middle Eastern nations etc. Moreover, water table is declining at a much faster rate.

Situation in Pakistan

Pakistan is a water stressed country. As per UNDP, by 2025 Pakistan will be facing acute to severe water scarcity. Moreover, water storage capacity of Pakistan is just 33 days, while India is 120 days and China 499 days.

Measures to deal

Water scarcity

① Built more dams

Pakistan loses alot of water to sea so Pak a water stressed nation should build small to medium water dams

② Build more canal and barrage

Pakistan should invest in building canal and barrage to divert the water flow, and increase its storing capacity.

(3) Innovation in agricultural practices
Pakistan must adopt innovative agriculture practices for instance drip irrigation, sprinkle irrigation instead of flood irrigation

(4) Crops which absorb low water
Pak. should invest less in crops like cotton and sugarcane which absorb max water. other alternative crops like maize are reliable

(5) Water issue should be in textbook course

The government must adopt and take water scarcity an existential challenge. Course should be designed in a way which impart student with the knowledge that water is an essential commodity which must not be taken for granted.

(C)

Vaccine

It is a process in which a weak agent or microorganism is pumped inside the body and the body antibodies get activated and kill it and remember that killed ^{agent} and its associated microorganism whenever it reenter body

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Types

- ① Weakened live viruses are when used as a vaccine to boost immunity of the body, eg measles
- ② Killed viruses: are used to activate the immunity of body, eg Polio
- ③ Toxoid virus are used which are inactivated and increase body immunity
- ④ Conjugate: viruses combined with protein to activate body immunity

Detail?

Section - B

Q#s

Reason?

- (d)
- (i) 8, 4, 32, 7, 5, 35
- (ii) 17, 19, 23, 28, 31, 37

(b)

Data

Income tax amount = 1500

Income tax rate = 7%

sol

$$\begin{aligned}
 &= \frac{7}{100} \times 1500 \\
 &= 105 \\
 &= 1500 - 105 \\
 &= 1395 \text{ Rs.}
 \end{aligned}$$