

(SECTION – B)

- Q. 6. (a) If the sum of four numbers is 105. When 03 is added to a number, twice of another number, five times of third number and fourth number become equal to each other. What are these numbers in ascending order? (5)
- (b) Find out the correct word from the given jumbled spellings. (5)
- | | | |
|---------------|--------------|--------------------|
| (i) UCTREUTRS | (ii) LOVONAC | (iii) CIHPROSTATAC |
| (iv) YNTIAUMH | (v) NNTHORER | |
- (c) Find the missing numbers in the series below (5)
- | | | |
|--------------------------|----------------------------|------------------------------|
| (i) 121, 11, 81, 9, ?, 7 | (ii) 100, 50, 25, ?, 6.25 | (iii) 4, 9, 64, 125, 1296, ? |
| (iv) 2, 5, 12, 24, 48, ? | (v) 44, 22, 66, 33, 132, ? | |
- (d) If the sum of three digit number is 15 and sum of 10th and unit digit is 12. The difference of unit digit from 10th digit is equal to 02. What is the three digit number? (5) (20)

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GSA :- (CSS-2024)

Q6 part a

Sum of four no's = 105

Let 1st No Be A

$$A + B + C + D = 105$$

$$A + 3 = 2B$$

$$A = 2B - 3 \text{ --- (2)}$$

$$5C = 2B$$

$$C = \frac{2B}{5} \text{ --- (3)}$$

$$D = 2B \text{ --- (4)}$$

$$A + B + C + D = 105$$

$$2B - 3 + B + \frac{2B}{5} + 2B = 105$$

$$5B + \frac{2B}{5} = 105 + 3$$

$$\frac{25B + 2B}{5} = 108$$

$$\frac{27B}{5} = 108$$

$$27B = 108 \times 5$$

$$B = \frac{364}{27} \times 5$$

$$B = 20$$

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putting the values of B in eq (1), (2), (3), (4)

$$A + 3 = 2B$$

$$A + 3 = 2(20)$$

$$A + 3 = 40$$

$$\boxed{A = 37}$$

$$\boxed{B = 20}$$

$$C = \frac{2B}{8}$$

$$= \frac{2(20)}{8}$$

$$= \frac{40}{8}$$

$$\boxed{C = 5}$$

⇒ Values in Ascending
Order as

$$\boxed{5, 20, 37, 40}$$

$$D = 2B$$

$$= 2(20)$$

$$= 40$$

part B:-

1) Structure

3) CATASTROPHIC

5) Nothin.

2) Volcano

4) Humanity.

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part C:-

1) 121, 11, 81, 9, ? 7

$$\begin{array}{ccccccc} & \times 11 & & \times 9 & & \times 7 & \\ & \curvearrowright & & \curvearrowright & & \curvearrowright & \\ 121, & 11, & 81, & 9, & \underline{49} & 7 \end{array}$$

Every odd place no is the square of even place number.



2) 100, 50, 25, ? 6.25

$$\begin{array}{ccccccc} & \div 2 & & \div 2 & & \div 2 & \\ & \curvearrowright & & \curvearrowright & & \curvearrowright & \\ 100, & 50, & 25, & \underline{12.5} & 6.25 \end{array}$$

Every upcoming no is the half of previous number.



3) 4, 9, 64, 125, 1296, ?

$$\begin{array}{ccccccc} 4, & 9, & 64, & 125, & 1296, & \underline{2401} \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ (2)^2 & (3)^2 & (4)^3 & (5)^3 & (6)^4 & (7)^4 \end{array}$$

The 1st two numbers are square of 2 and 3, second 2 numbers are cube of 4 and 5, and the next two numbers have power 4 of 6 and 7.



$$\begin{array}{r} 24 \\ 16 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 48 \\ 32 \\ \hline 16 \end{array}$$

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4) 2, 5, 12, 24, 48 _____

2, 5

$$2 \times 2 = 4 + 1 \quad 4 \times 2 = 8 + 4 \quad 8 \times 2 = 16 + 8 \quad 16 \times 2 = 32 + 16 \quad 32 \times 2 = 64 + 32$$

2 5 12 24 48 96



5) 44, 22, 66, 33, 132 _____

$$\begin{array}{r} 66 \\ 2 \overline{) 132} \\ \underline{12} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

$\div 2 \quad \div 2 \quad \div 2 \quad \div 2 \quad \div 2$

44, 22, 66, 33, 132, 66

Every even place term is half of the odd place one



Part d

Sum of 3 digit no = 18

$$U + T + H = 18 \quad \text{--- (1)}$$

$$U + T = 10 \quad \text{--- (2)}$$

$$T - U = 2 \quad \text{--- (3)}$$

Adding equ (2) and (3)

$$U + T = 10$$

$$- U + T = 2$$

$$\hline 2T = 12$$

$$\boxed{T = 6}$$

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$$U + 7 = 12$$

$$U + 7 = 12$$

$$\boxed{U = 5}$$

$$U + 7 + H = 18$$

$$7 + 5 + H = 18$$

$$12 + H = 18$$

$$H = 18 - 12$$

$$\boxed{H = 3}$$

So the number is 573

←→ (CSS-2024)

- Q. 4. (a) What is role of Carbohydrates and Vitamins in the body? Discuss briefly. (5)
- (b) Discuss the functioning of Liver and Pancreas. (5)
- (c) What are the standards of drinking water? How Heavy Metals in the water affect the living organisms? (5)
- (d) What is radioactivity? Discuss the laws of radioactivity. Name two radioactive elements. (5) (20)

$$H = 3$$

So the number is 573



(CSS-2024)

QUESTION #4:-

CARBOHYDRATES:-

The word carbohydrates literally means "hydrated carbon" consists of compounds of carbon, hydrogen and oxygen. Chemically they are polyhydroxy aldehydes and ketones.

e.g.:

Glucose, fructose etc.

Role of Carbohydrates:

Structural role

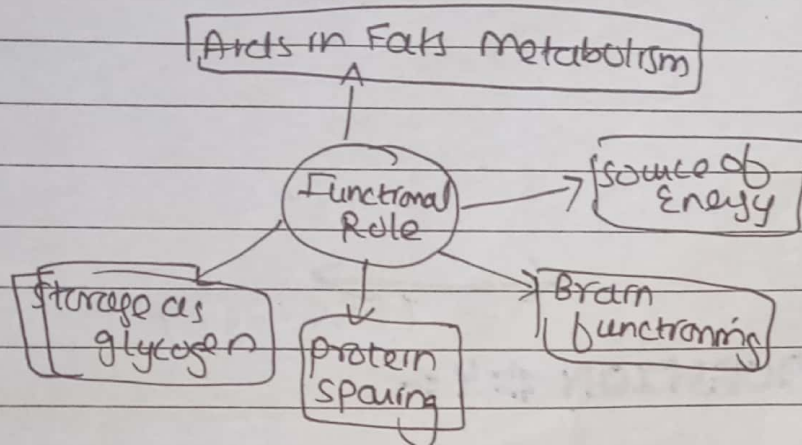
1) Some carbohydrates are main constituents of cell wall of

Functional role.

⇒ primary source of energy
Because after breakdown converted into glucose use as fuel for cells.

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- bacteria and microorganisms. tissues, organs.
- 2) Some proteins and fats form glycoprotein and glycolipids, providing structural support in extracellular matrix of bacteria and microorganisms.



Vitamins:- Vitamins are organic compounds, needed in small amounts and must be acquired through diet because they are not endogenously produced by body either or if it produces, are in insufficient quantities.

Role of water Soluble — Vitamin B

Vitamins:

- ↓ (Act as cofactor in enzymatic reactions)
- synthesize RBCs, fats etc.
- Vitamin C → Antioxidant, inhibit aging
- Heals injuries by producing collagen

Role of Fat Soluble Vitamins :-

Vitamin A	Vitamin D	Vitamin E	Vitamin K
Improves eyesight maintains integrity of skin, muscles and mucous membrane	Helps in growth of bone tissues, calcium and phosphate metabolism.	→ Antioxidant → Defense against diseases	Key role in blood clotting

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FUNCTIONS OF LIVER:

It is largest organ located in the upper right quadrant of body, beneath diaphragm and at the top of right kidney.

1) PRODUCTION:-

It produces bile - a digestive fluid helps in digestion and absorption of fats and fat soluble vitamins.

2) Metabolism:- metabolizes proteins, lipids and carbohydrates through conversion of lactic acid $\rightarrow$ glycogen, stored glycogen $\rightarrow$ glucose, ammonia to urea, and excess carbohydrates and proteins into fatty acids and triglycerides.

3) Detoxification:-

Detoxify many chemicals like ammonia, urea and uric acids from nitrogen of amino, food additives, pesticides, drugs etc.

4) Storage:-

Liver stores Iron and glycogen.

5) Synthesis:-

Synthesize nitrogenous wastes, lipids, cholesterol, lipoproteins and plasma proteins like prothrombin, albumin etc.

6) Recycling:-

Recycle the contents of old RBCs (e.g) Iron and other constituents of haemoglobin.

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FUNCTIONS OF PANCREAS:-

Endocrine

Region of pancreas perform endocrine function is "Islet of Langerhans" → hormone producing cells

Alpha cells

↓
Insulin Production

→ maintain blood sugar by suppressing glucose level

Beta cells

↓
Secretion of glucagon

→ maintain blood sugar by increasing glucose level.

Exocrine

1) produces digestive enzymes.

Amylase → to catalyze carbs digestion.

Lipase → to digest fats.

Trypsin + Chymotrypsin → for proteins digestion.

2) Secretes bicarbonate into small intestine to neutralize the acidic chyme that enters the stomach, creating optimal pH environment for the action of digestive enzymes.

Part C:-

STANDARDS OF DRINKING WATER (ACCORDING TO WORLD HEALTH ORGANIZATION(WHO) AND ENVIRONMENTAL PROTECTION AGENCY EPA)

Parameter	WHO/EPA Recommended Limit
pH	6.5-8.5
Turbidity	< 5 NTU
Total dissolved solids	< 500 mg/L

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Nitrate (NO_3^-)	$< 50 \text{ mg/L}$
Lead (Pb)	$< 0.01 \text{ mg/L}$ (10ppb)
Arsenic (As)	$< 0.01 \text{ mg/L}$ (10ppb)
Mercury (Hg)	$< 0.006 \text{ mg/L}$
Cadmium (Cd)	$< 0.003 \text{ mg/L}$
Bacteria (E. coli)	Should be absent in 100ml of water.

EFFECTS OF HEAVY METALS ON LIVING ORGANISMS:-

Heavy metals such as lead, mercury, arsenic and cadmium are toxic even at low concentration.

Their effects include.

1) ON HUMAN HEALTH:-

• Lead (Pb)

It affects the nervous system, especially in children causes learning disabilities and developmental delays.

• Arsenic (As)

Causes skin lesions, cancer and damages kidneys and lungs.

• Mercury (Hg)

It may damage the brain and nervous system, especially harmful to unborn babies.

• Cadmium (Cd):

It causes bone demineralization, kidney damage and is linked to cancer.

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2 ON AQUATIC LIFE:-

It accumulates in fish and aquatic organisms (bioaccumulation). Also disrupts reproductive systems and leads to death of species. Affects Biodiversity and food chains.

3 ON ENVIRONMENT:-

Contaminated water affects soil fertility and agriculture. Enters food chains, harming both animals and humans in the long term.

part d:

RADIOACTIVITY:-

It is a phenomenon in which unstable nuclei of certain elements emit electromagnetic radiations; alpha, beta or gamma rays, in its process to attain a stable condition, measured in Curie or Rutherford. the units of radioactivity.

LAWS OF RADIOACTIVITY:-

- 1) Radioactivity is a spontaneous process happens as a result of the decay of the nuclei.
- 2) The radioactivity rate does not depend on

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the extent of the reaction and is not affected by pressure and temperature.

3) Radioactivity is based on the conservation laws: conservation of charge, conservation of mass energy, conservation of momentum.

4) The chemical and physical properties of the daughter nuclei are independent of the properties of the mother nucleus.

5) The energy emitted in radioactivity is always accompanied by the alpha, beta and gamma particles.

6) The decay rate of radioactive substances depends on the number of atoms at the time.

Names of RadioActive Elements:-

1) Uranium - 238 (U-238)

2) Radium - 226 (Ra-226)

