

GENERAL SCIENCE AND ABILITY

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PART - II
SECTION - I

Increase length of theory portion
Keep length equal for all parts
Write complete logic and steps in
math portion

Question . 4

ANSWER - A

Solid waste Management

Definition

The process by which waste material are safely disposed in order to avoid hazard of pollution.

Methods employed in Solid waste management.

Solid waste management is carried out in various steps from collection point until decomposition.

Following are the major steps involved:

1- Collection.

Collection is the first step of waste management. In this step waste material is collected from various points. The waste is collected together and taken to a dumping point.

Collection requires certain prerequisites in order to work effectively, such as collection vans, workers and a well-organized municipal system.

2- Dumping and separation

After collection of the waste material from various parts, it is dumped into a central location which is usually away from residential or populous areas.

After dumping, the waste material is separated into various categories such as recycled products, non-soluble products and toxic substances. The non-soluble and toxic substances are taken for further processing.

3. Decomposition

The toxic material is taken on further

for decomposition. This process is carried out to avoid any hazard and accident during other processes of management of non-soluble waste. Such material includes ; batteries, medical equipments, aerosol sprays etc.

4- Composting

This is an important step for the decomposition or processing of non-soluble waste. In this step the waste material is placed into composting machine where decomposition of the material takes place with varying degree of temperature.

At first, The temperature is increased to a high degree for about an hour. Then the temperature is gradually decreased upto 40°C . This cycle is repeated for few times until non-soluble waste is decomposed while producing gas in the gas collection chamber.

Once the entire waste products are decomposed into a semi-solid

or liquid form for final step of solid waste management.

i. Disposal

Disposal is the final step of the process. In this step, a deep ditch is created in the ground away from the city area. The ditch is layered with protective sheets to avoid infiltration into ground which would disrupt the quality of under ground water table. Thereafter, the waste is disposed off into this ditch.

ANSWER : 4 B

Human Heart

Circulatory System

Circulatory system of human beings is composed of various interconnected elements. Every element perform its function in successfully carrying out the circulation of blood in entire body.

Human heart

Heart is the main organ of human body to pump blood through out body.

Structure

Human heart is composed of four chambers. They are as following:

- 1- Right Atrium
- 2- Right Ventricle
- 3- Left Atrium
- 4- Left Ventricle

These chambers pass blood through bicuspid and tricuspid valves.

Functioning of Heart

Mechanism of heart involves various parts of body with major function of heart. The mechanism of a single blood circulation is carrying out in following pattern:

- 1- Blood from the body is collected by capillaries and veins and is taken into the right atrium through pulmonary vein which is deoxygenated blood.
- 2- From right atrium the blood is

then sent to right ventricle through bicuspid valves.

3- After right ventricle blood is sent to lungs, where it gets oxygenated.

4- After oxygenation of blood, it is then sent back to left ventricle of heart through pulmonary artery.

5. Through tricuspid valve, the blood is then passed on to left atrium.

6- The oxygenated blood from heart is then sent to the body through arteries.

ANSWER : 4 C

Myopia and Hyperopia

Myopia

Myopia is a condition in which a person is unable to ^{clearly} see distance object. It is also known as short-sightedness.

Normally an individual can see beyond 6 meters, but in this condition an individual is unable to ^{clearly} see

beyond 6 meters. The vision is blurred due to convergence of visual lines.

When such conditions arise, spectacles of concave lens are used.

Hyperopia

Hyperopia is also a condition of blurriness of vision, but in this condition the vision for near objects is blurred. This is also known as long-sightedness.

In such a situation, an individual can see distance objects but cannot clearly see near objects in distance of 6 meters.

In this case, spectacles of convex lens can be used which converge the visual lines.

Major Parts of eyes

Eyes are the parts of the body which allow us to see things in visual range. Following are the major parts of eyes, divided into three categories:

1- The sclerotic layer

It includes the white bulging part of eyes.

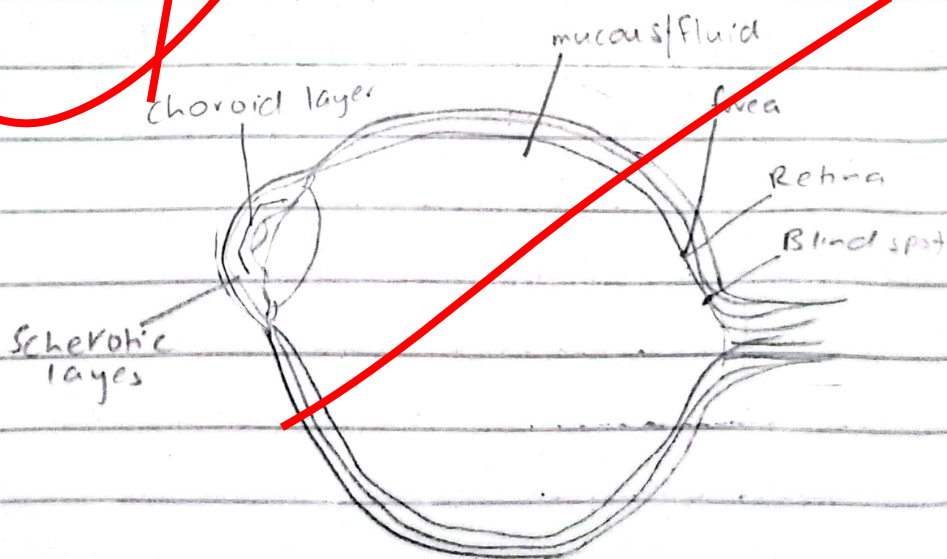
It directs light into pupil and cornea.

2- The choroid layer

It includes the dark part of eyes i.e. cornea and iris along with pupil.

3- The retina

Retina is the internal part of eyes. It is a screen where bipolar cells i.e. rods and cones are present.



ANSWER : 4 d

Uses of following

1- Microwaves

Microwaves are usually used in appliances for heating purposes.

2- Ultraviolet

Ultraviolet are used in ultrasonic machines.

3- X-rays

X-rays are used in various medical diagnosis machines such as X-rays machines, in telescopes.

QUESTION : 5

ANSWER - 5 a

Methods of food preservation

Definition

Food preservation is a process to

prolong the utility and usability of food items. The process involves storage of food item by various methods.

Organic method

- 1- Sun drying the food such as use in traditional ways e.g. drying of apricot and drying of meat.
- 2- Putting certain spices on the food. Pickling is one such method.
- 3- Using air tight containers to keep moisture away. This prevent growing of any fungus.

Inorganic method

- 1- Use of preservatives which are chemical products.
- 2- By low temperature cooking for minimum time period. Leaving the rest for later cooking.
- 3- Use of cold storage or refrigerators which does not provide suitable temperature for fungus or microbial growth.

ANSWER - 5b

Milky way

Definition

Milkyway is a galaxy in the universe. It is a spiral shape galaxy which appears white when viewed with the high ranged telescopes.

Milkyway is the galaxy in which earth is present. in the elliptic solar system.

Dark matter relation to galaxies

Dark matter is a spot in the center of galaxies which has a strong energy and magnetic field to attract the galaxies. This matter keeps the galaxies in their respective places

Different parts of galaxies

Galaxy is composed of various parts that stars are in their respective position due to a strong central energy. These parts include:

- 1- Solar systems ie, sun, moon and planets
- 2- Dust and ions
- 3- Asteroids
- 4- Comets
- 5- Dwarf planets

ANSWER: 5 C

Solar and Lunar eclipses.

Solar Eclipse

- 1- Solar eclipse occurs when moon comes between sun and Earth. and cast shadow on sun.
- 2- Occurs only in full moon.
- 3- It occurs twice a year
- 4- Types include; Total and ring eclipses

Lunar Eclipse

- 1- Lunar eclipse occurs when Earth comes between sun and moon. and cast shadow on moon.
- 2- Occurs in half both.
- 3- It occurs once a year.
- 4- Types include; Total and Partial eclipses

s-figure



s-figure



ANSWER : 5 d

Nuclear fission and fusion

Nuclear Fission

Nuclear fission is a chemical process in which atoms of chemical or radioactive substances break down resulting in emission of energy. This energy leads to or activates further atoms to break down.

It is a chain reaction which does not stop after beginning until the chemical substance fully breaks down. For example, in sun nuclear fission occurs.

Nuclear Fusion

Nuclear fusion is a chemical process in which atoms of various chemical or radioactive substances are brought together to react. This process initially requires energy to be carried out. It also releases some amount of

energy. For example, a atomic explosion occurs as a result of nuclear fusion

Ionic bond in table salt

Ionic bond

Ionic bond is a chemical bond which is formed by ions of opposite charges.

Table salt

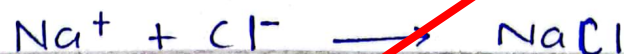
Table salt is the common salt which is used in various ways.

It contains two elements which have positive and negative charges.

The elements or the ions are

Sodium Na^+ and Chloride Cl^- .

The bond they formed can be written as;

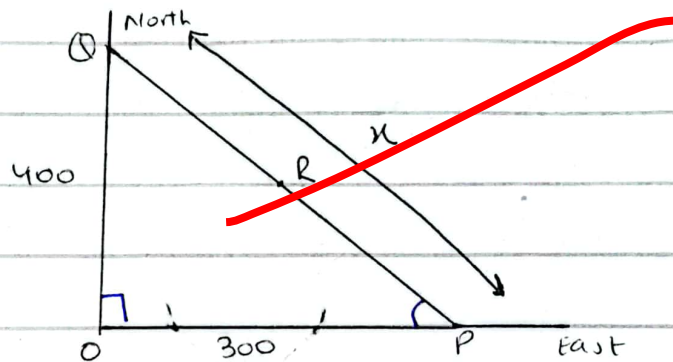


NaCl is a stable compound which is commonly known as Table salt

Section - II

QUESTION . 7 - A

ANSWER



By Applying pythagorean theorem

$$(\text{Hypotenuse})^2 = (\text{base})^2 + (\text{perpendicular})^2$$

$$(OQ)^2 = (OP)^2 + (OQ)^2$$

$$(x)^2 = (300)^2 + (400)^2$$

$$\sqrt{x^2} = \sqrt{(300)^2 + (400)^2}$$

$$x = \sqrt{90000 + 160000}$$

$$x = \sqrt{250000}$$

$$x = 500$$

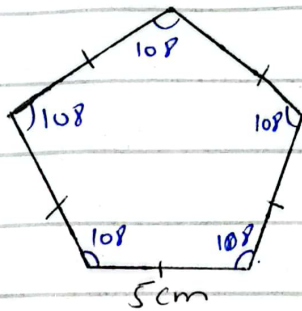
Now that PQ is 500, we can find the value of QR by dividing 500 by 2 because point R is right in the middle of P and Q. Hence $QR = \frac{500}{2}$

$$QR = 250$$

$$\text{Solution} \Rightarrow 250$$

Q.7 - b

ANSWER



Finding angles of Perimeter of regular Pentagon

A regular Pentagon has a ~~an~~ ~~all~~ interior angles of 108°

Now adding 108 ~~times~~ ^{five times} it

$$\text{# 5 times} \Rightarrow 108 + 108 + 108 + 108 + 108$$

$$= 540^\circ$$

$$\text{Perimeter of angles} = 540^\circ$$

Q.7-c

ANSWER

Mental age = 11 years

Chronological age = 9 years

IQ = x

Formula of IQ $\Rightarrow \frac{\text{mental Age}}{\text{Chronological Age}} \times 100$

$$= \frac{11}{9} \times 100$$

$$= 1.2 \times 100$$

$$= 120$$

~~IQ of person = 120~~

Q.7-d

ANSWER

Average age of 3 boys = 15 year

Ratio of ages = 3:5:7

Age of youngest boy = ?

$$\text{Age of boy 1} = 3n$$

$$\text{Age of boy 2} = 5n$$

$$\text{Age of boy 3} = 7n$$

Now putting in formula to find n

$$\frac{3n + 5n + 7n}{3} = 15$$

3

$$15n = 15 \times 3$$

$$\frac{15n}{15} = \frac{45}{15}$$

$$n = 3$$

Putting value of n to calculate age

$$3n \Rightarrow 3(3) \Rightarrow 9 \text{ yrs}$$

$$5(n) \Rightarrow 5(3) \Rightarrow 15 \text{ yrs}$$

$$7(n) \Rightarrow 7(3) \Rightarrow 21 \text{ yrs}$$

Age of youngest boy = 9 years

QUESTION - 8 (a)

ANSWER

Sum of three consecutive odd number is 273

Find three odd numbers.

let the number be = ~~x~~

Hence,

$$(x) + (x+1) + (x+2) = 273$$

$$x + x + 1 + x + 2 = 273$$

$$3x + 3 = 273$$

$$3x = 273 - 3$$

$$3x = 270$$

$$\frac{3x}{3} = \frac{270}{3}$$

$$x = 90$$

first odd number is 90

putting value of x in second number

$$x + 1 = 90 + 1$$

$$= 91$$

putting value of x in 3rd number

$$x + 2 = 90 + 2$$

$$= 92$$

$$\text{Therefore, } 90 + 91 + 92 = 273$$

Three consecutive odd numbers
are $90 + 91 + 92 = 273$

Are 90 and 92 odd numbers?

Q. 8 b

ANSWER

i - 4, 16, 36, 64, ?, 144

Since every number in series is twice even number. So,

Next in series number is twice the number 10.

$$\text{twice number } 10 = 10 \times 10 = 100$$

Series is 4, 16, 36, 64, 100, 144

ii - 30, 29, 27, ?, 20, 15

Series is in decreasing or descending order with ~~subtracting~~ ^{subtracting} a number in ascending order.

The number subtracted in the missing number is $27 - 3 = 24$

Series is 30, 29, ~~27~~, 24, 20, 15

iii - 1, 7, 15, 25, ?, 51

Series of the number is made by adding even number in ascending order.

ing order starting with six. to the answer of previous addition.

The number to be added to obtain answer is 12.

Now adding 12 in 25

$$12 + 25 = 37$$

Series is 1, 7, 15, 25, 37, 51

iv, 0, 2, 6, 12, 20, 30, ?

Series is increasing order of even number and adding to obtained answers

$$\text{ie } 0 + 2 = 2$$

$$2 + 4 = 6$$

$$6 + 6 = 12$$

$$12 + 8 = 20$$

$$20 + 10 = 30$$

$$30 + 12 = 42$$

The next number in series is 42

v. 48, 24, 72, 36, 108, ?

Q. 8 c

ANSWER

i- THIRSI
SHIRT

ii- GNDREA
GARDEN

iii- SCHAMOT

iv- ONL NDO
LONDON

v- HOLIDAY

HOLIDAY

Q. 8 - d

ANSWER

Given

Age of Sara = n years

Sara's mother = ~~n~~ $6n$ years

Age of Sara's brother = ~~n~~ $2n$ years

Sum of their ages ^{after 3 years} = 72

Find ages of all three

Solution

After 3 years ages of all three will be :

$$\text{Sara} = 3 + n$$

$$\text{Sara's mother} = 3 + 6n$$

$$\text{Sara's brother} = 3 + 2n$$

$$\text{Sum of ages after 3 years} = 72$$

$$n + 3 + 3 + 6n + 3 + 2n = 72$$

$$9n + 9 = 72$$

$$9n = 72 - 9$$

$$9n = 63$$

$$\frac{9n}{9} = \frac{63}{9} \Rightarrow 7$$

$$\text{Sara age} = 7$$

$$\text{Mother age at present} = 6x$$

$$= 6(7)$$

$$\text{Mother age} = 42$$

$$\text{Brother's age} = 2(x)$$

$$= 2(7)$$

$$\text{Brother's age} = 14$$

Hence, Sara age = 7

Mother's age = 42

Brother's age = 14