

General Science and Ability

Part II

Section II

Qno. 7:

a)

Soln:

$$V = ?$$

$$d = 14 \text{ cm}$$

$$\pi = 22/7$$

$$V = \frac{4}{3} \pi r^3$$

$$D = 2r$$

$$r = \frac{D}{2}$$

$$r = \frac{14}{2}$$

$$r = 7 \text{ cm}$$

$$V = \frac{4}{3} \times \frac{22}{7} \times (7)^3$$

$$V = \frac{4}{3} \times \frac{22}{7} \times \cancel{7} \times \cancel{7} \times 7$$

$$V = \frac{4}{3} \times 22 \times 49$$

$$V = \frac{4}{3} \times 1078$$

Date: _____

Day: _____

$$V = \frac{4312}{3}$$

$$V = 1437.33 \text{ cm}^3$$

B)

Ans:

$$\text{Total Savings} = 25000$$

$$1 : 2 : 3 : 4 : 5$$

$$\text{Total parts} = 1 + 2 + 3 + 4 + 5$$

$$1666.66 = 15$$

$$\frac{25000}{15}$$

$$15 \times 1$$

$$\text{One part} = 1666.66$$

$$\text{Smallest Part} = 1$$

$$= 1 \times 1666.66$$

$$= 1666.66$$

C)

$$\text{i) } 2 \quad 6 \quad 18 \quad 54 \quad 162 \quad 486$$

which no. does not fit?

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

So, all number fit

ii) 3, 5, 7, 11, 13 17

Next prime number is 17

D)

$$a^2 + b^2 = c^2$$

$$(5)^2 + (12)^2 = \cancel{169} (13)^2$$

$$25 + 144 = 169$$

$$169 = 169$$

$$(13)^2 = (13)^2$$

Triangle is right triangle and angle is 90°

$$\text{Angle of } a = \frac{5}{13} = 22.6^\circ$$

$$\text{Angle of } b = \frac{12}{13} = 0.92 \times 90 = 82.07^\circ$$

$$\text{Angle of } c = \frac{13}{13} = 1 = 90^\circ$$

Checked by: _____

Date: _____

Day: _____

Date: _____

Q no. 6:

d)

i) SISTAICITS

STATISTICS

ii) LGEBMAR

ALGEBRA

c)

$$d = 36 \text{ km}$$

$$\text{Speed} = 18 \text{ km/h}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = \frac{36 \text{ km}}{18 \text{ km/h}}$$

$$\text{Time} = 2 \text{ hour}$$

$$\text{Starting time} = 1 \text{ pm}$$

$$\begin{aligned} \text{Reaching time} &= 1 \text{ pm} + 2 \text{ h} \\ &= 3 \text{ pm} \end{aligned}$$

b)

Original price = 200\$

Discount = 25% of 200\$

Tax = 6%

Discount = 25% of 200

$$= \frac{25}{100} \times 200$$

$$= 50 \$$$

Price after discount = 200\$ - 50\$
= 150\$

Tax = 6% of 150

$$= \frac{6}{100} \times 150$$

$$\text{Tax} = 9$$

Total amount paid = 150 + 9
= 159\$

a)

Apple : Berry : Cherry : Date = 3 : 6 : 2 : 5

Let each part = x

Apple = 3x

Berry = 6x

Cherry = 2x

Date = 5x

Checked by:

Date: _____

Day: _____

If Apple candies exceed
dates candies by 35

$$5x - 3x = 35$$

$$2x = 35$$

$$x = \frac{35}{2}$$

$$x = 17.5$$

$$\text{Berry} = 6x$$

$$\text{Berry} = 6 \times 17.5$$

$$\text{Berry} = 105$$

$$\begin{array}{r} 17.5 \\ \times 6 \\ \hline 105.0 \end{array}$$

Section I

Q no 4:

a) Chlorophyll

The green pigment in an organic compound is called Chlorophyll. It helps the plant to absorb light energy and manufacture food. Chlorophyll molecule resembles with Haem group of Haemoglobin. Haemoglobin is a protein which transport oxygen. But there

Checked by: _____

is a difference between the two molecules. The central atom of Chlorophyll is Mg^{++} while the central atom of haemoglobin is Fe.

b)

Role of Ribosomes in protein synthesis

Ribosome is a tiny granular structure. Palade was the first who discovered ribosome in 1955. Ribosomes of eukaryotes are composed of ribonucleo protein. Ribonucleoprotein contains equal amount of RNA and protein. The RNA in protein is Ribosomal RNA.

Functions

1) Ribosomes bind to mRNA which carries a copy of genetic code from DNA.

2) Ribosomes catalyze the formation of peptide bond.

3) When ribosomes reaches a stop codon, polypeptide chain is released.

4) Once this chain is released it folds into functional protein that can perform its role in cell.

d)

1) Biofuel

Biofuels are fuels produced directly or indirectly from organic materials including biomass plants and animal wastes.

2) Isotopes

Atoms of an element having same atomic numbers but different mass numbers are called isotopes.

e.g: ${}^1_6\text{C}$, ${}^{13}_6\text{C}$, ${}^{14}_6\text{C}$

3) Hydrosphere

Hydro means water and Sphere means planet. Hydrosphere is the total amount of water on a planet. Hydrosphere can be liquid vapour or ice.

4) Troposphere

Troposphere starts from earth surface and extends at 50 km, we live in this layer. Weather patterns in this layer.

c)

Methods of Solid Waste Management

Solid waste management methods include:

1) Landfills

It is a place where garbage is generally stored on the ground. It is the cheapest method for waste disposal in the world.

Date: _____

Day: _____

2) Incineration

Incineration is also a technique of transformation of waste by action of fire. This waste cause air pollution but it can be used to produce heat and electricity.

3) Waste Collection

Collection of waste is done by means of garbage trucks which go to each point of garbage to collect waste.

4) Energy recovery

Energy recovery from waste is the process of converting non recyclable waste materials into usable heat, fuel or electricity through combustion, anaerobic digestion and pyrolyzation.

Q no. 3.

d) Dengue

Dengue is a mosquito viral disease that spread in all regions in recent years. It is transmitted by female ~~virus~~ mosquitoes mainly of the species *Aedes aegypti*. This virus is mostly common in tropical and subtropical regions including in South America and central Africa. It is not a contagious disease which spread from person to person.

Symptoms:

The symptoms of dengue infections are

- ★ Flu-like illness
- ★ High fever
- ★ Severe headache
- ★ Pain behind the eyes
- ★ Rashes on skin
- ★ Nausea, Vomiting
- ★ Muscles and joint pain

Checked by: _____

Causative agents.

There are four distinct type of virus that cause dengue are:

- DEN 1
- DEN 2
- DEN 3
- DEN 4

Others species are *Aedes aegypti*, *Ae. albopictus*

Remedies

- ★ Dispose off solid waste properly
- ★ Cover all the domestic storage containers
- ★ Apply appropriate insecticides in houses
- ★ Use personal household protection such as window screens, long sleeved clothes, vaporizers
- ★ Improve mobilization for sustained control vectors

c)

Merits and demerits of volcanic eruption.

Merits:

- 1) Volcanic ashes contain nutrients that create fertile soil for agriculture.
- 2) Volcanic activity brings mineral deposits such as gold, silver, iron to the ground.
- 3) Volcanic eruption build landscapes that attract tourists.
- 4) Heat from volcanic activity can be used to generate geothermal power which is clean.
- 5) Hot springs created by volcanoes attract tourists that boost economy.

Demerits:

- 1) Volcanic eruption release gases and ash into the atmosphere which cause respiratory problems.

Checked by: _____

2) Volcanic gases and ashes also contaminate water bodies.

3) Eruption triggers other natural disasters like earthquakes and wildfire.

4) It damages infrastructure leading to loss of life.

5) Volcanic flow destroy everything in their path.

b)

Doping

Doping is the process of adding a small impurity to a pure semiconductor to change its electrical conductivity.

Types:

i) Intrinsic semiconductor

These are pure semiconductor materials like Si or Ga with no impurities added. Their electrical conductivity is low and highly sensitive to temperature.

Checked by: _____

2) Extrinsic semiconductor

These semiconductors are doped with impurities to change their electrical conductivity. It has two types

- N-type semiconductor

It is doped with an element from group V because group five has five valence electrons, one more than Silicon's four. This extra electron act as charge carrier.

Such as Phosphorous. Majority charge carriers are negative called n-type.

- P-type semiconductor

It is doped with an element from group III such as boron. Group III have three valence electron. This create a hole or vacancy where an electron should be in crystal lattice.

The majority charge carriers are positive holes called p-type.

a)

Cell is the basic structural and functional unit of life. Cell form organelles to perform various functions. To manage all the process within a cell, cell divides into various compartments each with a specific functions. These are called organelles.

Mitochondria:

Mitochondria is very important organelle. They are present only in Eukaryotic cell. They are involved in manufacturing and supply of energy in the cell. That's why it is called power house of the cell. Mitochondria are composed of lipid and protein. Mitochondria are involved in metabolic process. Energy is released during this process. This energy is transferred to ATP, which is broken down into ADP. ADP absorb energy from mitochondria and again become ATP.

Checked by: _____