

GSA MOCK

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SECTION - B (1)

QUESTION - 4(A)

Flood Definitions

Floods are a natural disaster that occur when water overflows the banks of rivers or it directly overflows onto land that is dry. Floods have many different types of classification such as urban flooding, flash floods, GLOF and so on.

Main Causes of Floods

Causes

Human

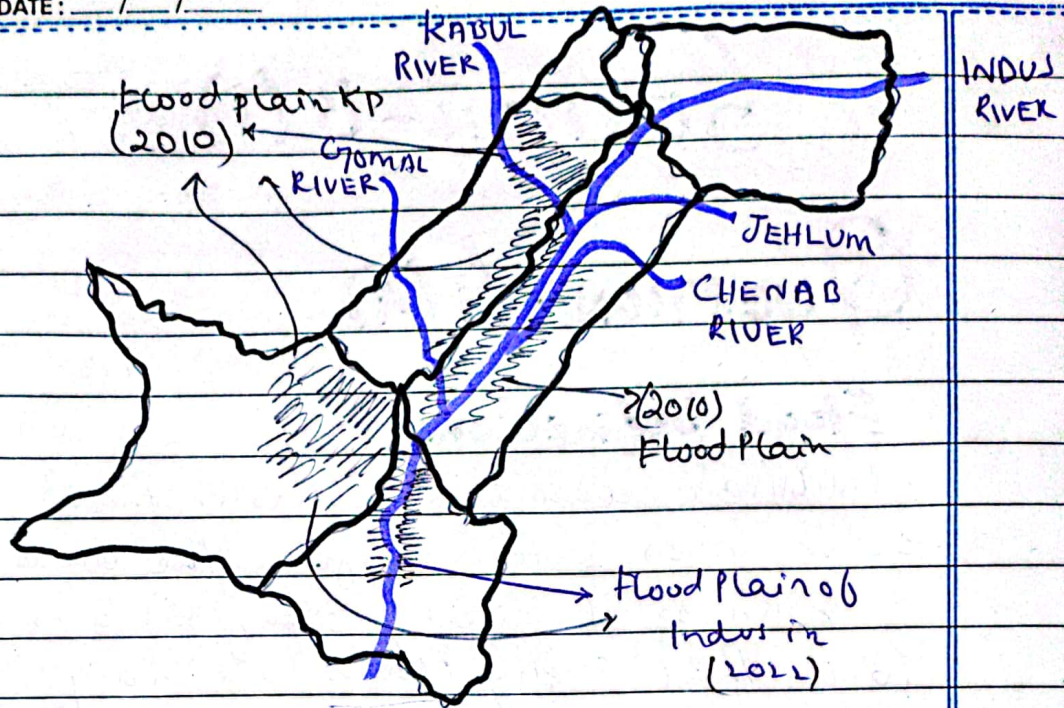
- (a) Alteration of Landscape
- (b) Urbanization
- (c) Climate change
- (d) Encroachment on
- (e) River/flood plains
- (f) Dam failures.

Natural

- (a) Excessive Rainfall
- (b) Glacial Melting
- (c) Landslides
- (d) Tsunamis/Earthquakes

Difference between 2022 and 2010 Floods

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Cause

Both had the same cause monsoon rains were excessive.

Land Covered:

2010 :- $\frac{1}{5}$ th Total Land Area

2022 :- $\frac{1}{10}$ th of total Land Area

Death Destruction:

2010 : 2000 deaths ; 20 million directly affected

2022 : 1730 deaths , 33 million affected.

Floods of 2022 were caused by excessive

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rainfall in the lower plains of the Indus. These were localized ~~and~~ rains that brought close to 800% more rain in Balochistan and 500% more rain in Sindh. These are primarily blamed on climate change and global warming.

ROLE OF NDMA

NDMA stands for National Disaster Management Authority. The primary role of NDMA is to coordinate the post disaster response and to some extent ensure districts, tehsils implement pre-disaster mitigation measures. NDMA also works on coordinating with provinces to minimize the risk of disasters.

QUESTION 4(B)

Atoms form mainly two types of chemical bonds:-

a) Ionic Bond

b) Covalent Bond

Ionic Bonds:-

In the ionic bond, the exchange of electrons takes place from an atom

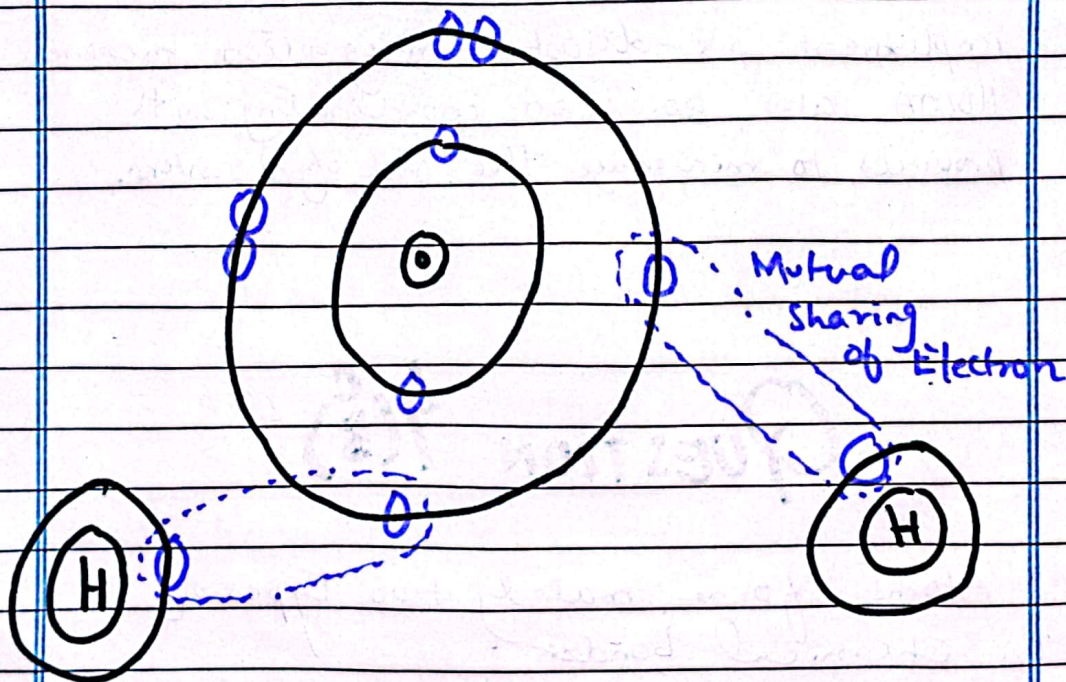
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that has an affinity of electrons to an atom that has a deficiency of electrons. Example :- NaCl

Covalent Bond

In this bond, the mutual sharing of electrons between two atoms. As illustrated below, the bonds that water (H_2O) are covalent bonds.

STRUCTURE OF H_2O



O is an electron deficient atom/molecule. It needs to complete its octet/in the p-shell it needs to have 8^{electrons}. However, it only possess 6 electrons. Hydrogen also

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on the other hand, and needs to complete its duplet.. It needs 2 electrons in its s-shell. The atom only possess one. Covalent bonding is mutually beneficial for both as both share the electrons and gain stability.

Q4 (d)

Material	Definition	Example
Conductor	A conductor is a materials that possess property such as heat and electrical conductivity	Steel, Copper Silicon Iron
Semi-Conductor	A semi-conductor is a material that on its own cannot conduct heat or electricity but after doping the material can.	Silicon Germanium
Metals	A material that is malleable, ductile, has	

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free electrons ^{to} and
allow for conductivity
and tough physical
characteristics

Iron
Steel.

Plastics

These are non-
conductive, brittle
and non malleable
materials. These
materials deforms
when force is applied
permanently altering
their shapes.

~~Polyethylene~~
PVC.

Ceramics

It is a hard
non-reactive
material, that
is neither
metallic nor
organic; it
is heat, corrosion
resistant.

Brick,
Porcelain

QUESTION 4(B)

STARS

PLANET

Size

Stars are larger than planets. Sun is about 109 times the Earth.

Planets are comparatively smaller than the ~~Ear~~Stars.

Composition

Stars are composed of various gases; hydrogen and helium

Planets are from solid particles and are a combination of all 3 forms of matter.

Temperature

Temperature on stars is particularly higher to support nuclear fusion reactions on them

Temperature on planets is particularly lower.

Ability to support life

Do not possess the ability to support life

Possess the ability to support life.

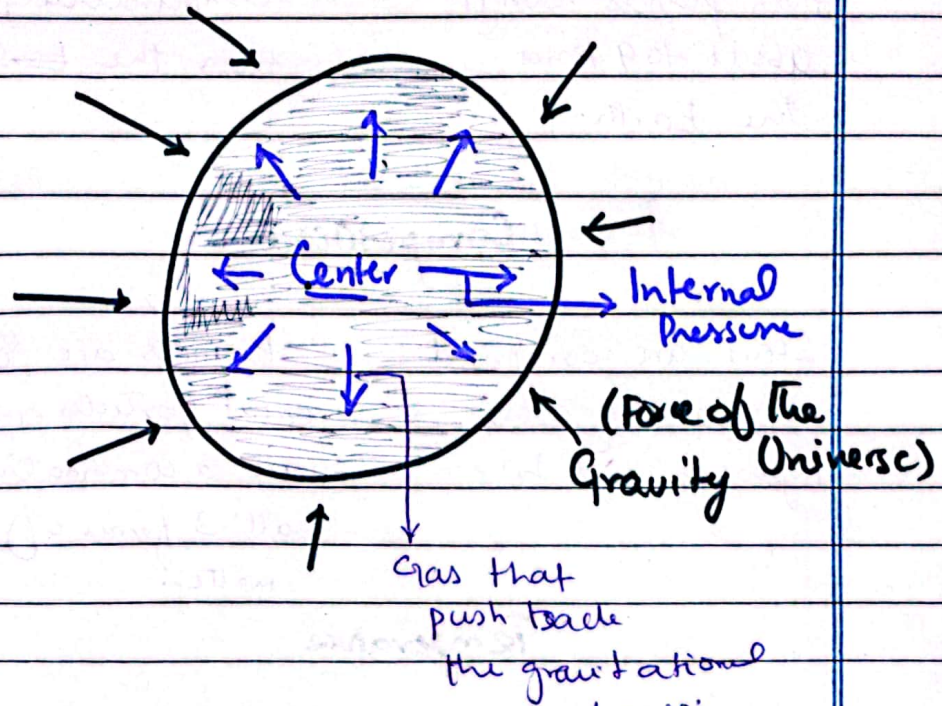
Ability to Emit Light

Emit light and has the ability to emit light.

Does not have the ability to emit light.

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STAR TO BLACK HOLE



⇒ Thermonuclear reactions keep the the internal and external forces in equilibrium.

⇒ Once the fuel runs out for the thermonuclear reactions, the stars collapse on themselves

⇒ Due to the force of the gravity the mass are condensed into a mass area.

⇒ This area is exerts a significant gravitational pull due to the Inverse square law.

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$$\left| \frac{F d m_1 m_2}{r^2} \right|$$

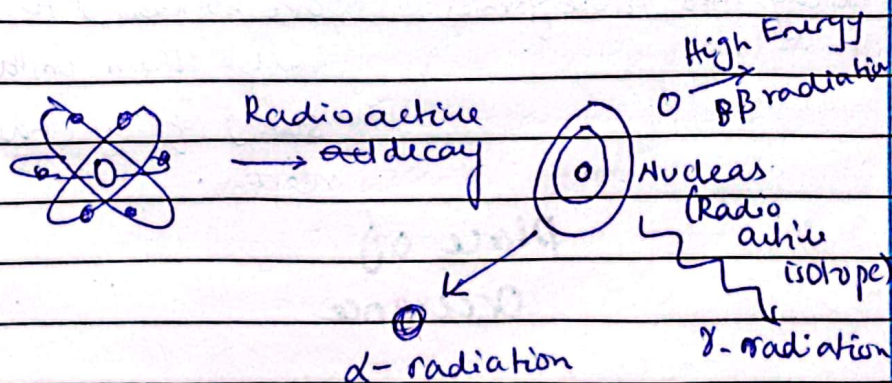
⇒ This area is known as the black hole.

QUESTION - 5(A)

Radio Activity

'It is the property of some unstable atoms to emit nuclear radiation.'

α , β , γ rays are emitted by the decay of the atom.



Atoms will spontaneously decay from their unstable radioactive isotope to stable

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isotopes. During this process, energy (radioactive) is released which is called radiation.

Difference between Natural And Artificial Radioactivity

Natural Radioactivity

Artificial Radioactivity

Source

Radioactivity is induced by natural sources.

It is induced by human activities

Process

Radiation is released when unstable nuclei decay into stable forms.

Radiation is released when stable nuclei are bombarded to make them unstable setting off a chain reaction.

Place of Occurrence

Nature, Sun, and Earth's core.

Nuclear Reactors, Atomic Bombs.

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Q5(B)

Polio

It is a muscular skeletal disease that can cause paralysis in the lower body. It is spread due to the polio virus and three types: Polio Type I-III.

Symptoms

Polio is an asymptomatic disease. In some cases the disease may cause sore throats, fever. However majority would not show any symptoms.

Cause of Spreading

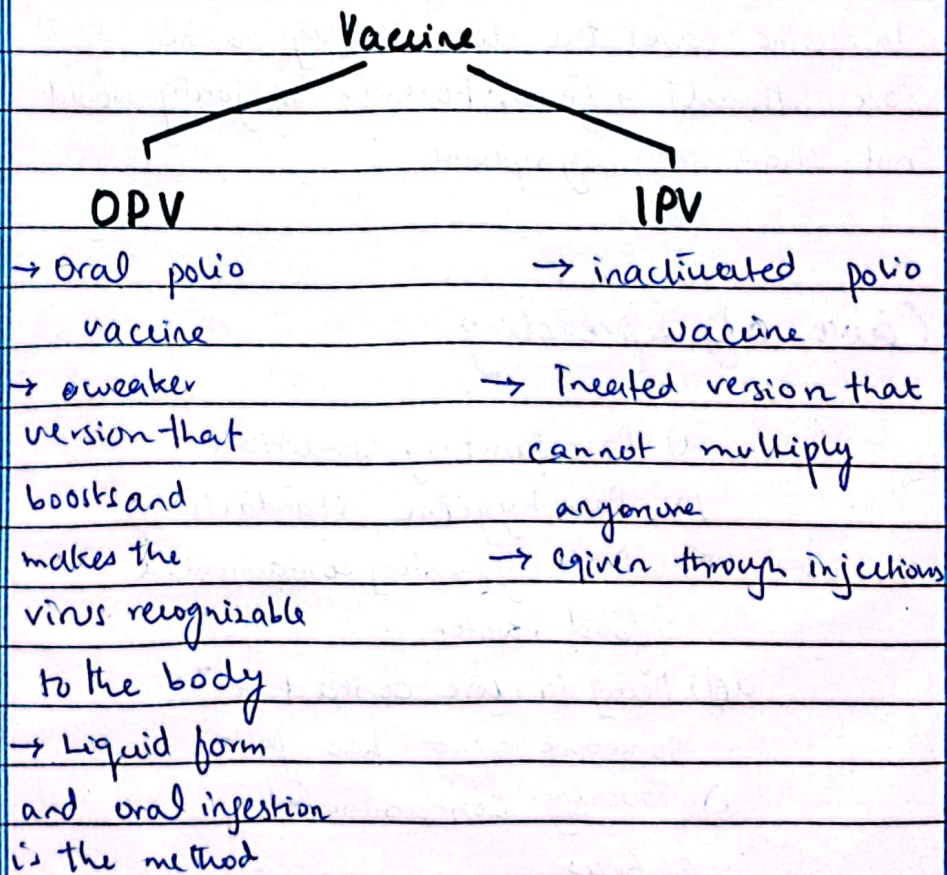
- a) Poor Sanitary Conditions
- b) Poor hygiene standards
- c) Drinking/Eating contaminated food, water
- d) Being in close contact with someone who has polio
- e) Touching contaminated surfaces

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Prevention

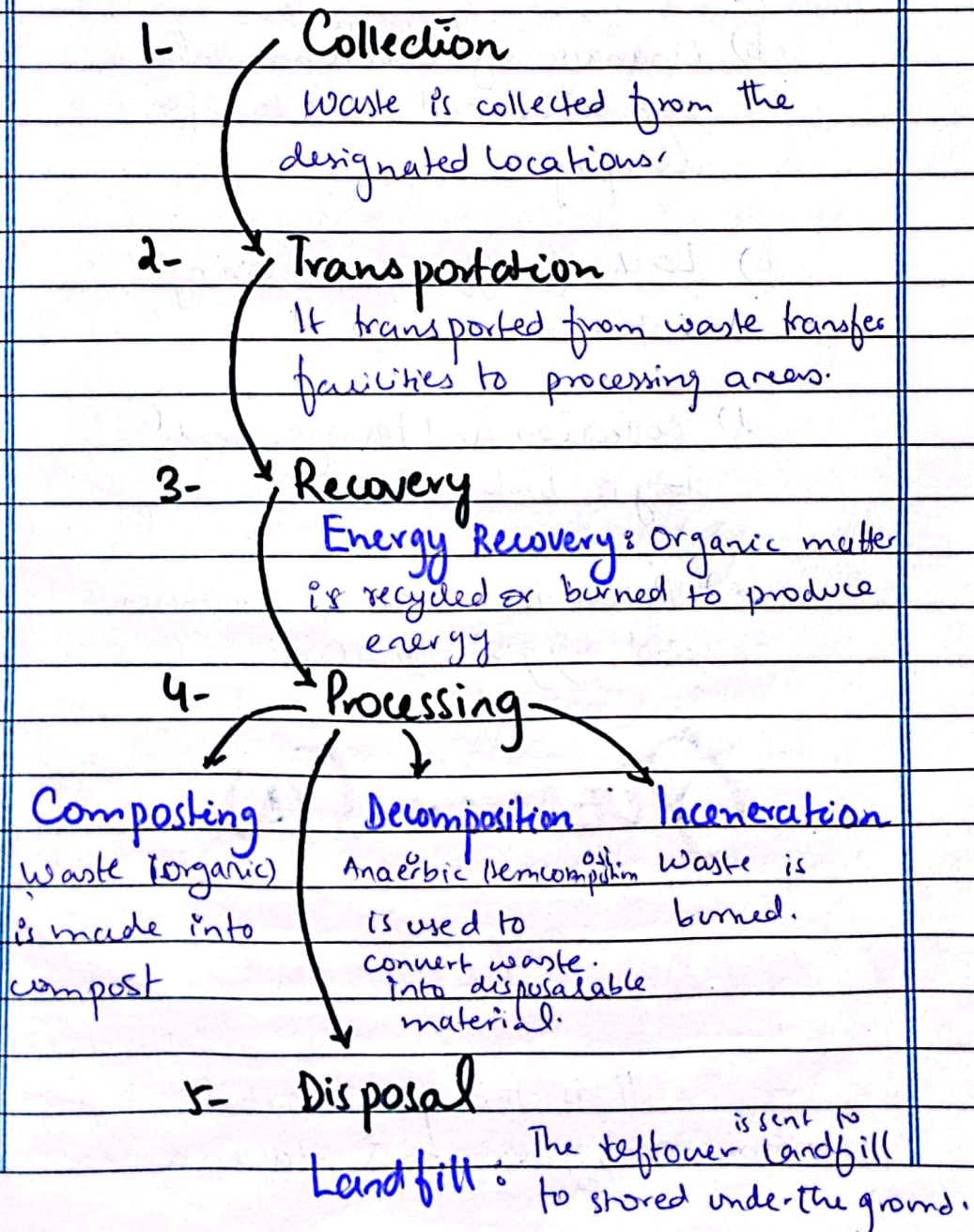
- a) Vaccination
- b) Adopting the correct sanitation and hygiene practices.
- c) Ensuring the source of food/water is not contaminated
- d) Maintaining excellent hygiene on a personal level.

Vaccine



QUESTION 5(C)

STEPS INVOLVED IN SOLID WASTE MANAGEMENT



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ISSUES OF SWM IN PAKISTAN

- a) Lack of finances and authority of SWM agencies
- b) Unaware of ^{International} Environmental practices and resort to open dumping
- c) Lack of efficient processing centers
- d) Collection and transfer model ~~legis~~ is broken.
- e) Public is unaware of sanitation and hygienic practices.

QUESTION (10)

POPULATION PLANNING

It is the process when communities, governments take a

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holistic view of their population and plan for the future. This plan may endorse or discourage a population increase. It depends place to place and region to region.

For example, Japan is facing a population crisis due to their aging population, while Pakistan is facing a crisis of over population. Governments chart a course of action that manages the population of the country.

Benefits

- a) Resources are adequately managed
- b) Crime and ~~sa~~ Deviance can be effectively curbed
- c) Health facilities are not overburdened
- d) Employment can be guaranteed.
- e) Homelessness can be curbed
- f) Migration patterns can be reversed.
- g) Growth (Inclusive) can be achieved.

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SECTION - B (II)

Question No. 6(A)

Solution

$$\text{Enrollment in Jan '22} = 850$$

$$\text{Enrollment in Jan '23} = 1120$$

$$\begin{aligned} \text{Difference} &= 1120 - 850 \\ &= 270 \text{ students} \end{aligned}$$

$$\% \text{ difference} = \frac{270}{850} \times 100$$

$$= 31.76\%$$

QUESTION 6.(B)

$$\text{Age of son} = x$$

$$\text{Age of man} = 5x$$

Two years ago, condition was

$$(x - 2)^2 + (5x - 2)^2 = 114$$

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$$\Rightarrow x^2 - 2x + 4 + 25x^2 - 20x + 4 = 114$$

$$\Rightarrow 26x^2 - 22x = 106$$

$$\Rightarrow 2(13x^2 - 11x) = 106$$

$$\Rightarrow 13x^2 - 11x = 53$$

$$x(13x - 11) = 53$$

Two Conditions

$$x = 53$$

$$13x - 11 = 53$$

$$13x = 53 + 11$$

$$= 64$$

$$13x = 64$$

$$x = \frac{64}{13}$$

$$\frac{64}{13}$$

$$\boxed{x = 4.9}$$

if Son's age is
53, the man's
age would be
65. which is
impossible

$x = 4.9 \rightarrow$ present age of
son is 4.9 years

and

$x = 5x \rightarrow$ Present of man
 $= 24.9$ years

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QUESTION - 6 (C)

Solution

The number of heads = 48

Number of feet = 140

As we know that both animals have same number of heads and different number of feet

Let $x = \begin{matrix} \text{(hens)} \\ 2 \end{matrix}$ } Number of feet
 $y = \begin{matrix} 4 \\ \text{(cows)} \end{matrix}$ } for cow & hens

$$x + y = 48 \text{ (heads)} - \text{Eq (1)}$$

$$2y + 4x = 140 - (2)$$

xing (1) by '2'

$$(2x + 2y = 96) - (3)$$

-ing (2) by (3)

$$2y + 4x = 140$$

$$\underline{2y + 2x = 96}$$

$$2x = 44$$

$$\boxed{x = 22} - (4)$$

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Put (4) in (1)

$$x + y = 48$$

$$22 + y = 48$$

$$y = 48 - 22$$

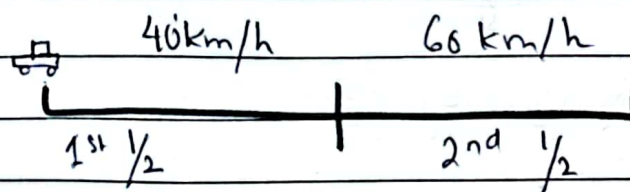
$$\boxed{y = 26}$$

Number of hens = 22

Number of cows = 26

QUESTION 6 (b)

Solution



Car speed during 1st half of
Journey = 40 km/h

Car speed during 2nd half
of Journey = 60 km/h

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$$\begin{aligned}\text{Average} &= \frac{60 + 40}{2} \\ &= \frac{100}{2} \\ &= 50 \text{ km/h}\end{aligned}$$

Average speed of the car = 50 km/h

QUESTION. 07(A)

Solution

Let 'x' be the number

Given Condition

$$\Rightarrow \frac{x}{6} + 50 = 60$$

$$\Rightarrow \frac{x}{6} = 60 - 50$$

$$\frac{x}{6} = 10$$

$$\boxed{x = 60}$$

Check

$$\frac{60}{6} + 50 = 60 \Rightarrow 10 + 50 = 60$$

$$\Rightarrow \boxed{60 = 60}$$

Proved.

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QUESTION 7(B)

Solution

Given Data:

8, 16, 24, 34, 40, 48

The following series are all the multiples of '8'. As shown below

$$8 \times 1 = 8$$

$$8 \times 2 = 16$$

$$8 \times 3 = 24$$

$$8 \times 4 = 32$$

$$8 \times 5 = 40$$

$$8 \times 6 = 48$$

However, in the series '34' is the odd one out because it does not appear in the multiples of '8'. The correct version would be the above multiples

QUESTION 7(D)

Solution

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Given Data

$$\begin{aligned} \text{Even Day Tariff} &= \text{Rs. } 2000/- \\ \text{Odd Day Tariff} &= \text{Rs. } 1000/- \end{aligned}$$

$$\begin{aligned} \text{Total cost of stay} &= \text{Rs. } 30,000/- \\ \text{Day on which stay} \\ \text{started} &= 5^{\text{th}} (\text{odd}) \end{aligned}$$

$$\begin{aligned} \text{Since Total cost of tariff} &= 1000 + \\ & \quad \underline{2000} \\ &= 3000/- \end{aligned}$$

$$\begin{aligned} \text{Cost/Tariff} &= \frac{30,000}{30,000} \\ &= 10 \text{ nights/days} \end{aligned}$$

Since the tariff was of 2 days

$$10 \times 2 = 20 \text{ days}$$

$$\begin{aligned} \text{Stay started on } 5^{\text{th}} &= 5 + 20 \\ &= \underline{\underline{25}} \end{aligned}$$

Check out date = 25th of
the month

QUESTION 7(C)

Given Data =

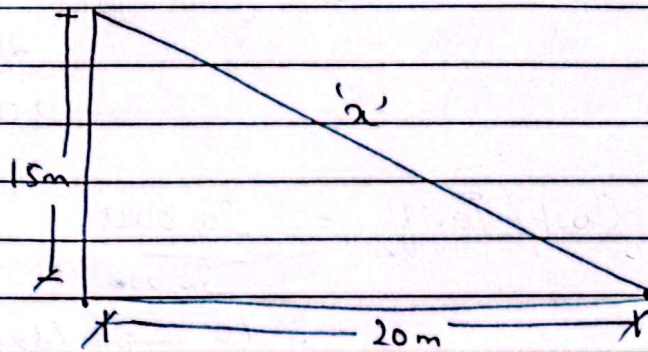
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Tower height = 15m

Distance from base = 20m

Distance to top from person's position = x

Figure:



Apply Pythagoras Theorem

$$(x)^2 = (20)^2 + (15)^2$$

$$= (325) + 400$$

$$x^2 = 725$$

$$x = \sqrt{725}$$

$$\boxed{x \approx 29.92m}$$

The distance from the person's position to the top is approximately 29.92m