Read the question carefully and identify whether it tests scientific concepts, numerical skills, or analytical ability.

Answer exactly what is asked especially when a question has multiple parts, address each part fairly according to its marks.

Mock Exam
General Science & Ability

Part – II

Section-I

For a 5-mark part, write at least 2 and at most 3 sides of the answer sheet; neither too short nor unnecessarily long.

Manage time wisely: approximately 35 minutes per full question, or about 8 minutes per 5-mark part.

(Q.ro 2)

(1)

Use simple, correct scientific terminology; avoid vague or overly theoretical explanations.

Difference between Star and Planet

Make answers look scientific and applied, not just bookish.

following are the differences between star and planet:

Use flowcharts, diagrams, tables, or rough sketches wherever they add clarity (e.g. cycles, processes, mechanisms).

1) Stars generate energy by nuclear fusion. Planets on the other hand does not generate energy.

Ensure diagrams are relevant, neat, and properly labeled.

2) Stars emit light and shine on their own, while planets reflects light from a star.

Demonstrate clear understanding of basic concepts in physics, chemistry, biology, and everyday science.

In numerical questions, write the formula first, then substitute values and show step-by-step working.

3) Stars are mostly composed of hydrogen and helium. Planets are composed of

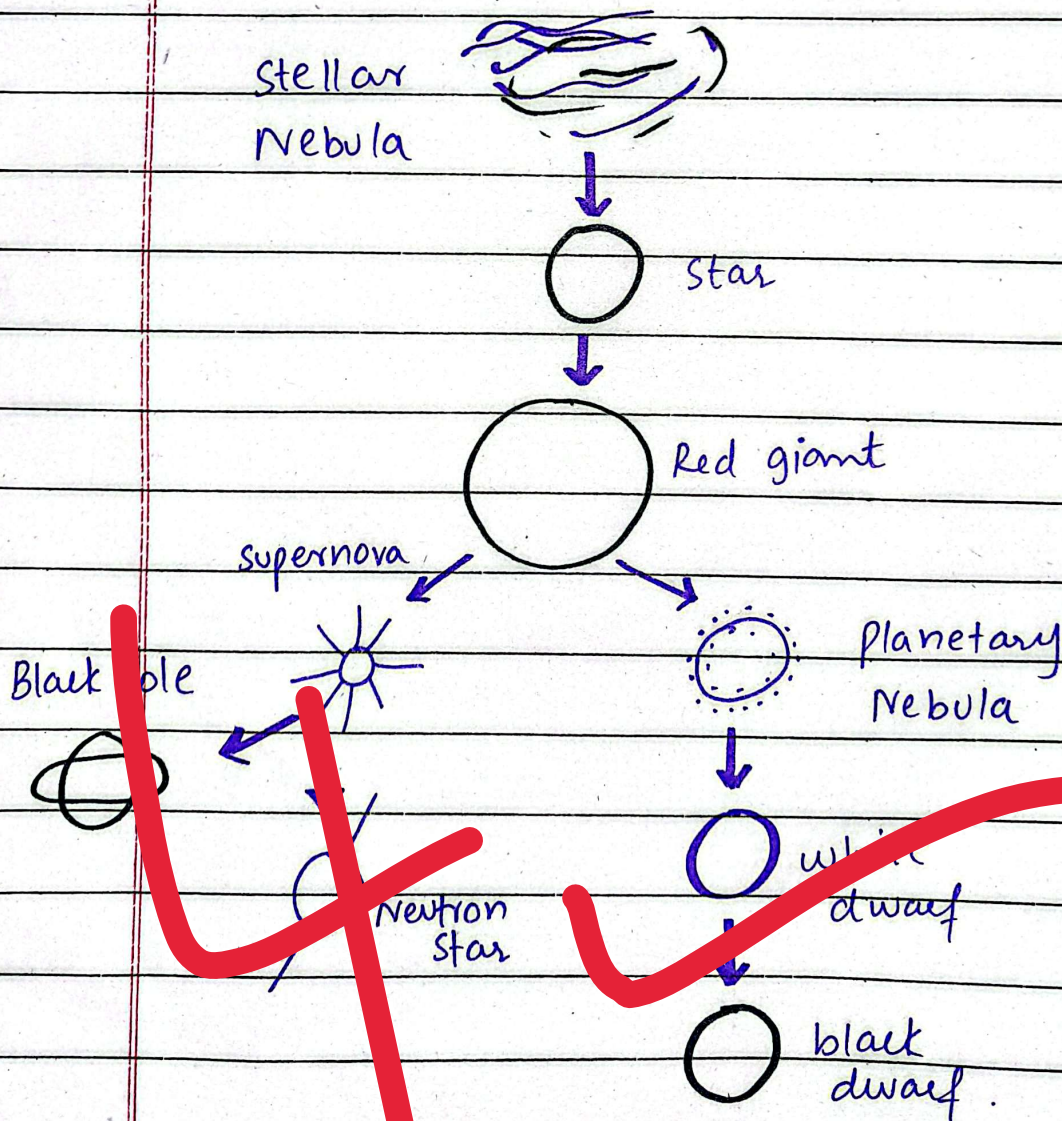Always mention correct units, symbols, and conversions in calculations and final answers.

rocks or gasses.

4) Stars are extremely high in temperature. While planets are cooler compared to stars.

5) Stars are Sun, Sirius. While Planets includes Earth, jupiter.

Life cycle of a Star:

Stellar Nebula

Star

Red giant

supernova

Black hole

Planetary Nebula
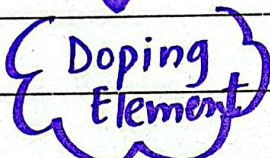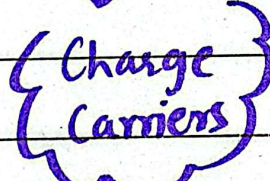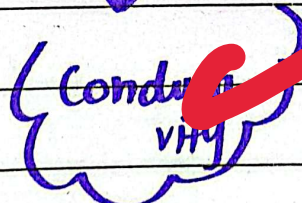
white dwarf

Neutron Star

black dwarf.

⟨B⟩

Semiconductors:

These are the materials with conductivity between conductors and insulators.

For example: Silicon, Germanium

Difference between n-type and p-type:

N-Type	Feature	P-Type
Pentavalent e.g. Phosphorus	Doping Element	Trivalent e.g. Boron
Electrons (Negative)	Charge Carriers	Holes (positive)
Due to Electrons	Conductivity	Due to holes

Modern Applications:

Following are the modern applications

+ n-type and p-type semiconductors;
→ 1. Diode transistors, ICs.
→ 2. Solar cells, LEDs.

(C)

Global Warming :

Global warming is gradual increase in Earth's average temperature due to greenhouse gases trapping heat.

Mechanism of Greenhouse Effect :

1. Sun emits energy; Earth absorbs some and reflects some as Infrared radiation

2. Greenhouse gases trap Infrared radiation in the atmosphere

3. This warms the Earth's surface and lower atmosphere.

Major Greenhouse Gases:

1. Carbon dioxide (CO_2)
2. Methane (CH_4)
3. Nitrous oxide (N_2O)

(D)

Tsunami:

A series of large ocean waves caused by sudden displacement of water.

Natural Triggers:

Following are the natural triggers.

1. Underwater earthquakes.
2. Volcanic eruptions.
3. Landslides into the ocean.
4. Meteorite impacts.

Potential Impact on Coastal Areas:

Following are the potential impact on coastal areas:

1. Flooding and destruction of infrastructure.
2. Loss of human life.
3. Soil erosion and salinization of farmland.
4. Economic and environmental damage.


(Qro. 3)
(A)

Mitochondria:

Mitochondria are very important organelles found only in Eukaryotic cells. The structure of mitochondria maybe a rod or a filament like structure. Consists of two membranes. Outer is smooth, inner mumebrane consists of many infolding called cristae. There are also small particles F_1 present inside the matrix.

Inner membrane

outer membrane

→ Ribosomes

DNA ←

→ F_1 particles

cristae
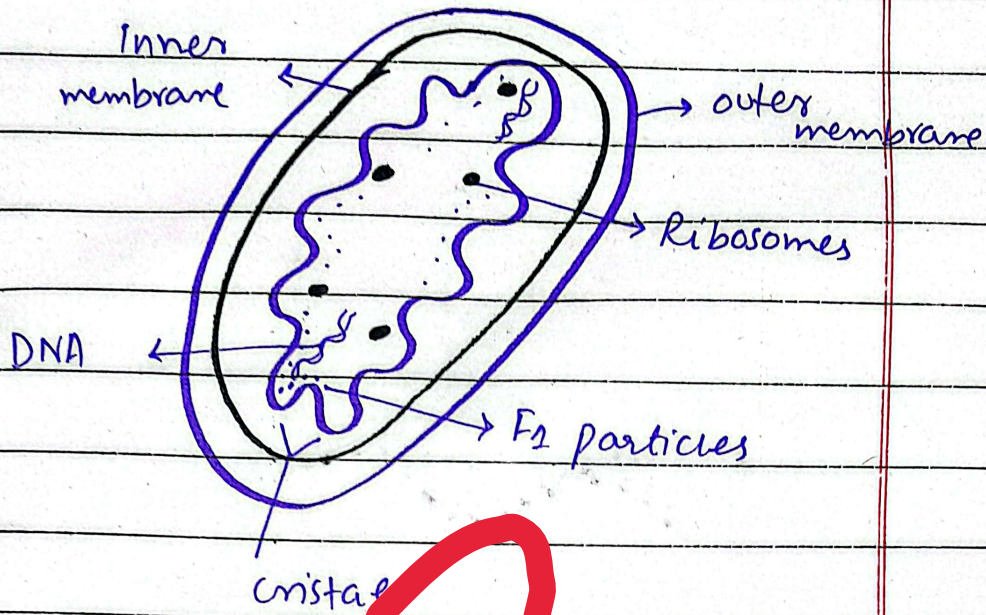
÷ Mitochondria

Why Called "power house" of the cell :

Mitochondria called the power house of the cell because it is involved in manufacturing and providing energy to cells.

Ribosomes :

These are small, spherical, non-membrane-bound, can be free in cytoplasm or attached to rough endoplasmic reticulum.
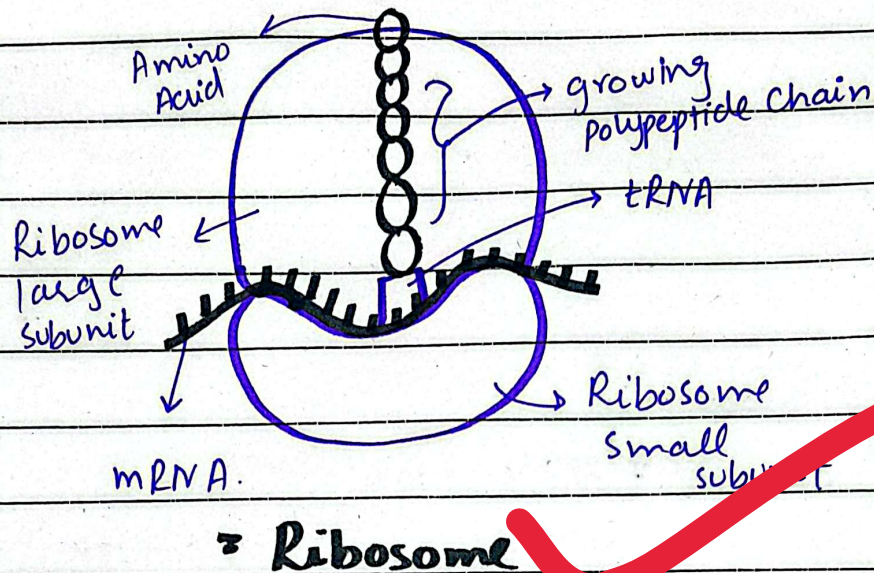
Function :

Protein Synthesis by translating mRNA into polypeptides.

Amino Acid

→ growing polypeptide chain

→ tRNA

Ribosome large subunit

mRNA.

→ Ribosome small subunit

= **Ribosome**

~**(B)**~

Enzymes:

Enzymes are biological catalysts that speed up chemical reactions without being consumed.

Example:

Amylase found in saliva, pancreas breaks down starch into sugar.

Lock and Key Model:

lock and key model explains how enzymes catalyze chemical reactions by binding specifically to their substrate.

Key points:

1. Enzyme as lock has a specific active site
2. Substrate as key fits exactly into enzyme's active site.
3. When substrate binds, it forms a temporary complex.
4. Enzyme helps convert the substrate into product.
5. The product leaves the active site and the enzyme is free to act again.

Factors Affecting Enzyme Activity:

1. Temperature - high or low can denature enzyme

2. PH - extreme acidity or alkalinity reduces activity.
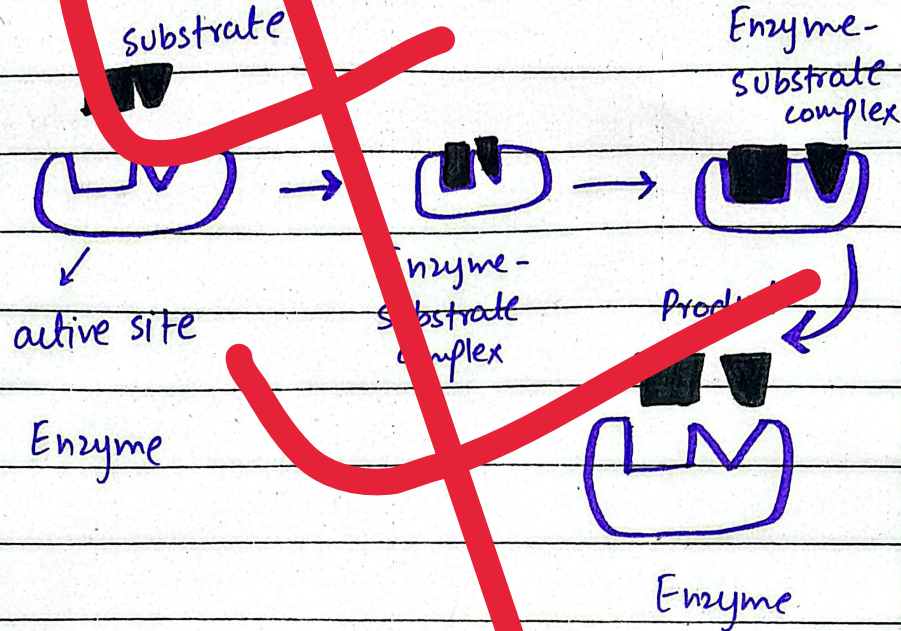
■ Lock and Key Model

⌐ (C) ⌐

Difference between Renewable and Non-Renewable Energy:

1.   Renewable energy is naturally replenished. On the other hand non-renewable energy is finite, cannot be replaced easily.

2. Examples of renewable energy is solar, wind, hydro.

While non-renewable energy sources are coal, oil, natural gas.

3. Renewable energy has low impact on the environment. While non-renewable energy has high impact on environment such as pollution, greenhouse gases.

Wind Energy as Sustainable Source :

Wind energy converts wind kinetic energy into electricity using turbines. It has a potential as sustainable source for the future.

1) Abundant and renewable
2) Low carbon footprint
3) Can reduce dependency on fossil fuels.
4) Especially effective in coastal and high-altitude regions.

~(Quo 3)~
~(D)~

Dengue Fever:

It is a viral disease transmitted by mosquitoes.

Vector:

Aedes aegypti mosquito. (a day-biting, black with white markings)

Symptoms:

Headache, high fever, joint/muscle pain, rash, nausea.

Preventive Measures:

Following are the preventive measures:

Eliminate mosquito breeding sites.

Use mosquito nets and repellents.

Community sanitation and fogging campaign.

Public awareness about early

symptoms and treatment.

Section - II

(Qro - 6)
(A)

A fills tank in 10 hrs   rate $= \dfrac{1}{10}$

B fills tank in 15 hrs rate $= \dfrac{1}{15}$

C empties tank in 30 hrs $= -\dfrac{1}{30}$

Combined rate:

$$= \dfrac{1}{10} + \dfrac{1}{15} - \dfrac{1}{30}$$

$$= \dfrac{3 + 2 - 1}{30} = \dfrac{\cancel{4}2}{\cancel{30}\,15} = \dfrac{2}{5}$$

Time to fill tank:

$$\text{Time} = \dfrac{1}{\text{Rate}} = \dfrac{1}{\frac{2}{15}} = \dfrac{15}{2} =$$

$$= 7.5 \text{ hours}$$

$$= 7 \text{ hours } 30 \text{ mins.}$$

$\dfrac{30,10,15}{}$

(B)

Ratio = $4 : 5 : 7$

let salaries = $4x, 5x, 7x$

after changes,

Y's salary increased by 10%.

$$= 5x \times 10\% = 5x \times 1.1$$

Z's decreased by 25% $= 7x \times 0.75$

$$= 5.25x$$

New total = $169\ldots$

So,

$4x + 5.5x + 5.25x = 14.75x$

Now

$14.75x = 169500$

$x = \dfrac{169500}{14.75}$

$x = 11,500.$

find salary of X So,

$= 4x.$

$= 4 \times 11,500$

$= 46000.$

〜•(C)•〜

let the number of original workers = W.

Total work = 1 unit

work done in 60 days = 3/5

Remaining work = 2/5

work rate per day = $\dfrac{work}{days}$

Rate = $\dfrac{3/5}{60} = \dfrac{3}{5 \times 60} = \dfrac{3}{300} = \dfrac{1}{100}$

$\dfrac{3}{5\times 60}$

$\dfrac{3}{300} = \dfrac{1}{100}$

Now,

Remaining work = $\dfrac{2}{5}$

Days taken = 20

Total work done = $\dfrac{W+10}{100}$ × 5

$\dfrac{W+10}{5W}$

This must equal remaining work

$\dfrac{W+10}{5W} = \dfrac{2}{5}$

$W+10 = 2$	$5W = 5$
$W = 8$	$W = 5/5$
	$W = 1$

(D)

let total students = n

Total marks = $78n$

Top 5 scores = $98+95+92+90+85$

$= 460$

Remaining students = $n-5$

75 total remaining average

So,

$= 75(n-5)$

$= 75n - 375$

Subtract top 5 from total.

$78n - 460 = 75n - 375$

$78n - 75n = 375 + 460$

$3n \qquad 85$

$n = \dfrac{85}{3}$

$n = 28.33$

$n \approx 29.$

total number of students
in the class

466
375
85

(Qro.7)
(A)

Total = 100

cricket = 65

Hockey = 40

Neither = 20

People who watch either = 100 - 20

$$= 80$$

Cricket + Hockey - Both = 80

$$65 + 40 - Both = 80$$

$$105 - Both = 80$$

$$Both = 105 - 80$$

$$Both = 5$$

(B)

length = width + 4

Perimeter = 2 (length + width) = 72

$$= L + W = \frac{72}{2}$$

$$\Rightarrow L + W = 36$$

Since length = Width + 4

So,

$$W + 4 + W = 36$$

$$2W = 36 - 4$$

$$2W = 32$$

$$W = \frac{32}{2}^{16}$$

$$W = 16.$$

Since length = __ so,

Depth = 2.5 m.

Volume = L × W × H

V = 20 __ 0 × 2.5

= 800 m³

$$\langle(d)\rangle$$

let father = f

Son = S

F + S = 75

F = 75 − S

10 years ago,

$$F - 10 = 4(S - 10)$$

$$75 - S - 10 = 4S - 40$$

$$65 - S = 4S - 40$$

$$105 = 5S$$

$$S = \frac{105}{5}$$

S = 2

so,

$f = 75 - s$

$f = 75 - 21$

$f = 54$.

Father = 54 years

Son = 21 years.

$$\begin{array}{r} 75 \\ 21 \\ \hline 54 \end{array}$$

———————

~·(C)·~

Distance = 400 km

Speed = $60 + 40 = 100\,km/h$

Time to meet = $\dfrac{400}{100}$ = 4 hours

Departure = 8:00 AM

So will meet at 12:00 PM

———————

The End!