Good for math work
Increase length of theory portion
Keep length equal for all answers

SECTION - I

QUESTION # 05

(A) INTRODUCTION:

The atmosphere contain many micro-organisms, that are very difficult to see through naked eyes. These tiny living organisms take their nutrients and water contents present in the food. Due to this the food gets spoiled and is unable to eat. The spoilage of food by pathogens is prevented by food perservating techniques. The growth of bacteria, fungus and viruses are thus prevented in the food. This preservation of food check the growth of micro-organism by blocking air content, decreasing chemical reactions.

FOOD PRESERVATION:

"Food Preservation is a Technique by which the spoilage of food is prevented and is made edible for long duration."

METHODS OF FOOD PRESERVATION

(i) FERMENTATION:

In this method, the food is processed and altered to make edible things. e.g:- Cheese, Bread e.t.c

(ii) FREEZING:

Freezing is the method in which the chemical reactions of pathogens are checked by decreasing temperature below the optimum level of enzymatic activity.

(iii) CANNING:

In this technique, the food is packed in air-tight canner, and block the air entry, required for the growth of bacteria.

(iv) VACCUM-PACKAGING:

In this method, the food is packed in vaccum packaging and dissuades pathogen from growing due to lack of air in the packages.

(1) DRYING FOOD:

It is simple method of food preservation, in which the water content of food is dried. Due to less water content pathogens are difficult to grow in food medium.

(8)

INTRODUCTION:

The universe is made of up of billions of galaxies. These galaxies are several light years away from each other. Milky way is the galaxy in which our solar system is present. It is present in Galactic plane. Galaxies are composed of stars, planets, Asteroids, Gas, dust

MILKY WAY:

Milky way is the name of Galaxy in which our solar system is present. It is flat, disk like with several arms. It consists of sun, planets, stars and dust.

RELATION OF DARK MATTER TO GALAXIES:

Dark matter composed of around 27% of the universe. It is unexplored and unseen matter

which do not reflect lights and thus are undetectable. But the presence of dark matter in galaxies have profound effect on the rotation of stars and planets. The gravitational pull and other forces in galaxies are brought up by these dark matter. Thus, dark matter is very crucial for regular motion and rotation of galaxies.

DIFFERENT PARTS OF GALAXIES:

i. **STARS:** Stars makes up the biggest portion of galaxies. Each star have their own planets and are present in several planes of galaxies.

ii. **DUST:** Another component of Galaxy is dust, the dust is due to huge collision of rocks and resulting debris.

iii. **GAS:** Galaxies also contain many gases such as hydrogen, helium, Carbon and thus it consist major portion of galaxy

(c) # DIFFERENCE BETWEEN SOLAR AND LUNAR ECLIPSE:

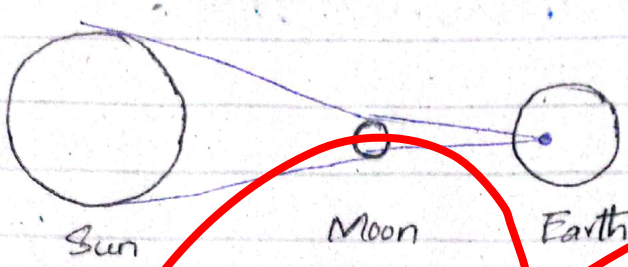
i. DEFINITION:

Solar eclipse occurs when moon comes in between the sun and earth, making its shadow on earth. While, lunar eclipse occurs when rotation of earth comes in between moon and sun.

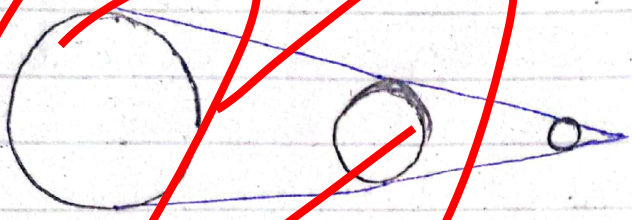
ii. TYPES:

Solar eclipse is of three types i.e Total solar eclipse, partial solar eclipse and annular solar eclipse. However, lunar eclipse consists of two types i.e total lunar eclipse and partial lunar eclipse.

SOLAR ECLIPSE.



LUNAR ECLIPSE.



ALIGNMENT:

In solar eclipse, moon align in such a way that it blocks the light of sun on specific area of earth. While, in lunar eclipse, earth align in such a way the it forms a shadow on the moon making it appear red or dark orage.

(D) # INTRODUCTION:

The atoms contain huge energies due to presence of intra-atomic particles i.e electrons, neutrons and protons. When atoms are broken down or combine together, they emit large amount amount of energy. These atomic reactions are called nuclear fusion and fission.

NUCLEAR FISSION:

In this type, nucleus is bombarded with neutrons, resulting in break down of element and loss of energy

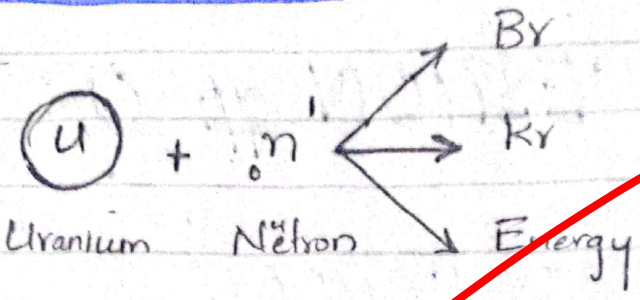
i.e: ${}_0^1n + {}_{92}^{235}U \longrightarrow Ba + Kr + Energy$

NUCLEAR FUSION:

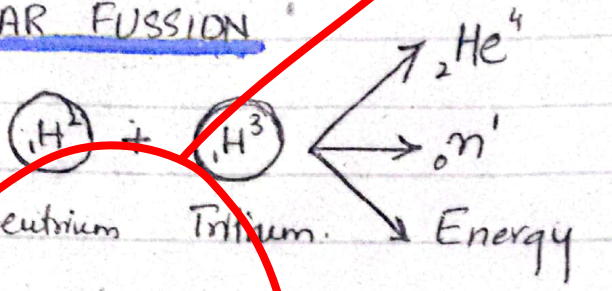
In this type, two nucleus are combined or fused together to emitt large amount of energies.

i.e ${}_1^2H + {}_1^3H \longrightarrow {}_2^4He + {}_0^1n + Energy$

NUCLEAR FISSION



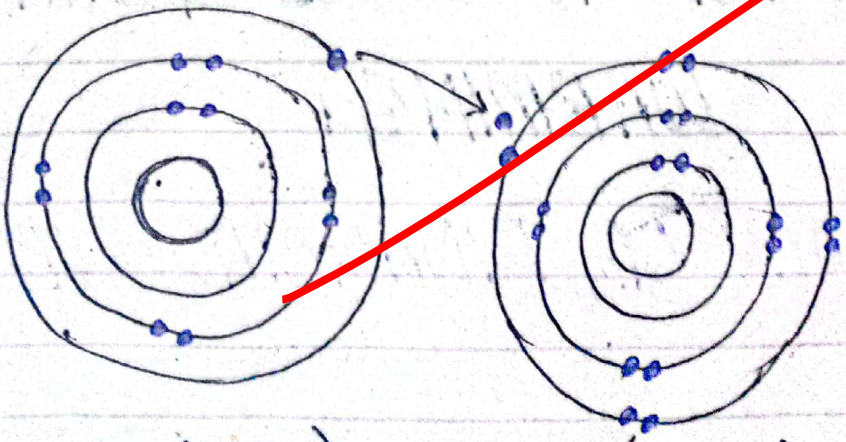
NUCLEAR FUSSION



IONIC BOND IN TABLE SALT:

Table salt (NaCl) contains ionic bond between sodium and chlorine. In this type of bond chlorine get one electron from sodium to complete its outer shell, while sodium gives one electron present in its outer orbit to complete octate rule.

Illustration:



Na (Sodium) ⟶ Cl (Chlorine)

QUESTION # 03

(A) INTRODUCTION:

2023 was reported as the hottest year according to Asian Development bank. Due to increase green house gas emissions, global warming is at unprecedented levels Recurrent floods, droughts, heatwave, wildfire are among the huge climate calamities due to global warming. Unfortunately, developing countries are facing many hurdles to tackle impacts of Global warming, some are mentioned below:

HURDLES TO TACKLE GLOBAL WARMING:

(a) LACK OF FINANCIAL SUPPORT:

Many developing countries put high hopes on COP-28 session, But the announcement of

loss and damage fund (LDF) is just a lip service. Still, no any clear blue-prints for allocation, distribution of funds are tabled down by developed countries.

(B) POOR IMPLEMENTATION:

Despite many resolutions passed after Paris Agreement to align energy supplies to green energy, many developing countries faces lack of implementable policies to tackle the impact of global warming.

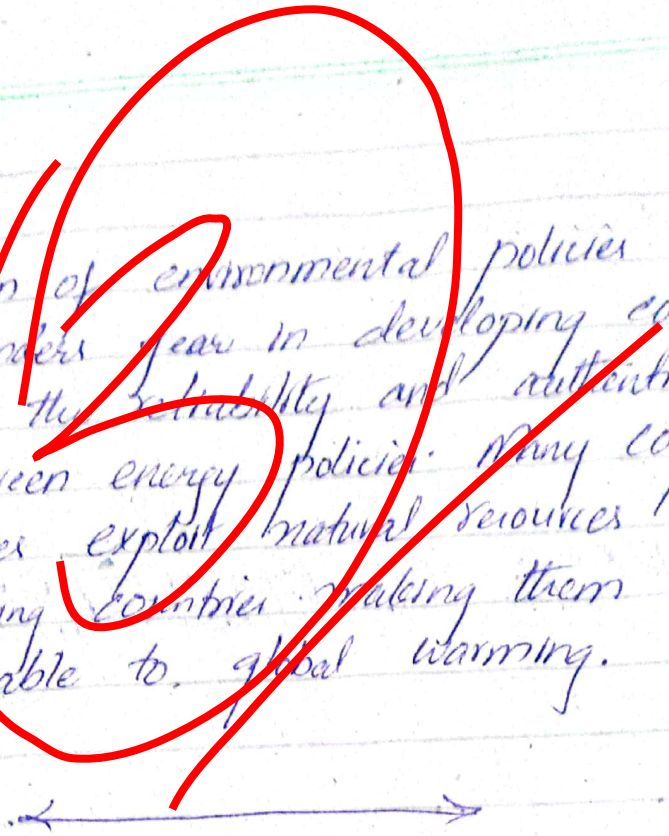
(C) DIFFICULT TO TRANSITION FROM FOSSIL FUELS:

In COP-28, it was concensually agreed to transition from fossil fuels. Unfortunately, many developing countries excessively depends on hydrocarbons for energy production. It is difficult for them to transit without green energy robust.

(D) CORPORATE INTERESTS:

The presidency of COP-28 was given to major oil producing idustry of UAE. This bogus and skeptical

operation of environmental policies engenders fear in developing countries about the reliability and authenticity of green energy policies. Many corporate businesses exploit natural resources of developing countries making them vulnerable to global warming.



(B) INTRODUCTION:

Human body needs various nutrients in specific proportion for proper growth and development. Any deviation to the required levels results into malnutrition. The nutrients in specific portions constitutes balanced diet composed of many macro and micro-nutrients.

BALANCED DIET:

Nutrients required for living beings in particular proportion for normal growth and development is known as balanced diet. The balanced diet of human beings consists of:

- Carbohydrates
- Proteins
- Fats
- Vitamins
- Other micro-nutrients

PROTIEN:

Protien consits about 10-12pc of balanced diet. It is acquired from fish, eggs, meat e.t.c

CARBOHYDRATES:

Carbohydrates constitutes about 60-70pc of balanced diet. It is present in fruits, vegetables and wheat.

FATS:

It constitutes about 20-25pc of balanced diet. It is of two types ie saturated or unsaturated fats. It is biggest source of energy.

VITAMINS:

There are two types of vitamins i.e water soluble and fat soluble vitamins. They are required for normal functioning of body.
e.g:- Vitamin A, B, C, D, E, K.

OTHERS:

Other nutrients consists small micro-nutrients and elements such as zinc, magnesium, potassium.

(c) INTRODUCTION:

Machine learning is the subset of Artificial learning. It has revolutionized the today's world by increasing the productivity and reducing time-space consuption. Machine learning has diversed implications that has revolutioned the world beyond expectations.

IMPACTS OF MACHINE LEARNING

(i) INCREASE PRODUCTIVITY:

Due to automation and self-learning capability of computers through machine learning, the productivity is increased at unprecedented levels.

(ii) REDUCE TIME CONSUMPTION:

The historical analysis and self-guiding principles of machine

learning making computers to operate quickly, without taking much time to process.

(iii) AUTOMATION:

Machine learning engender automatic capabilities to the computers, making them to self-process and analyse the given task and operate automatically. It has revolutionized the today's world by incorporating this automation in industrial, healthcare, and education facilities.

(v) IMPROVED DECISION-MAKING:

Machine-learning has improved decision making power of humans. It facilitates to analyze cost-benefit results of any action based on previous records. Thus, it has facilitated mankind in every decision of today's world.

(D) DIFFERENCE BETWEEN RAM AND ROM

(i) DEFINITION:

RAM is known for Radom-access memory, which is read and write memory of the computer. While ROM is known for Read only memory, which exclusively read the memory.

(ii) VOLATILITY:

RAM is temperory memory and thus volatile and is erased when switch is off. However, ROM is non-volatile and is thus permanent memory.

(iii) MODIFIABILITY:

RAM memory is easily and frequently modified. While ROM is difficult to modified after manufacture

iv. USEAGE:

ROM is used permanent and long-lasting purposes for while RAM is used temporarily and for short-term purposes.

v. TYPES:

RAM consists of static and dynamic memory cells. While ROM consists of PROM, EPROM and EEPROM.

QUESTION # 8

(A) Data:

Sum of three consecutive odd numbers = 273
Three consecutive odd numbers = ??

Solution:

Let the number be

$x+1, x+3, x+5$

According to the question

$(x+1)+(x+3)+(x+5) = 273$

$x+1+x+3+x+5 = 273$

$3x+9 = 273$

$3x = 273-9$

$3x = 264$

$x = 264/3$

$x = 88$

So, the numbers are

$88+1 = 89$

$88+3 = 91$

$88+5 = 93$

The three consecutive odd number are

$\boxed{89, 91, 93}$ Answer

(B)

i) 4, 16, 36, 64, ____

$4 = 2^2$

$16 = 4^2$

$36 = 6^2$

$64 = 8^2$

$100 = 10^2$

So the missing number is 100 Answer

ii) 30, 29, 27, ___, 20, 15

30 → 29 : −1

29 → 27 : −2

27 → 24 : −3

24 → 20 : −4

20 → 15 : −5

So, the missing number is 24 Answer

iii) 1, 7, 15, 25, ___, 51

1, 7, 15, 25, ___, 51

+6 +8 +10 +12 +14

∴ 25 + 12 = 37

So, the missing number is 37 Answer

(iv) 0, 2, 6, 12, 20, 30, ___

0, 2, 6, 12, 20, 30, ___
+2 +4 +6 +8 +10 +12

∴ 30 + 12 = 42

So, the missing number is 42 Answer.

(v) 48, 24, 72, 36, 108, ___

48 = 12 × 4
24 = 48 ÷ 2
72 = 12 × 6
36 = 72 ÷ 2
108 = 12 × 9
54 = 108 ÷ 2

So, the missing number is 54 Answer.

(C) i. THRSI = SHIRT
GNDREA = GARDEN
SCHAMOT = STOMACH
ONLNDO = LONDON
HLODALY = HOLIDAY

(D) Data:
Sara's Age = x
Sara's Mother Age = $6x$
Ali's Age = $2x$
After 3 year, Sum of their ages = 72
Age of Sara, Ali and Mother = ?

Solution:
After three ages
$(x+3)+(6x+3)+(2x+3) = 72$
$x+3+6x+3+2x+3 = 72$
$9x+9 = 72$
$9x = 72-9$
$9x = 63$
$x = 63/9 = 7$

Sara's mother age = $6x$
$6 \times 7 = 42$
Sara's Brother age = $2x$
$2 \times 7 = 14$

So, the age of Sara = 7 years
Sara's Mother = 42 years
Sara's Brother = 14 years Answer.

SECTION - II

QUESTION - 7

(A) Data:-

OP = 300km

OQ = 400km

QR = ??

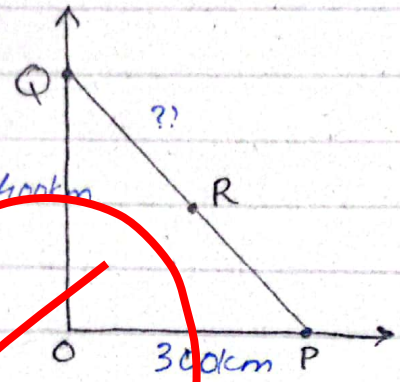


Illustration :-

According to Pythagoras Theorem

$H^2 = P^2 + B^2$

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

$H^2 = 160000 + 90000$

$\sqrt{H^2} = \sqrt{250000}$

$H = 500km \rightarrow PQ = 500km$

According to the question asked.

$QR = \frac{PQ}{2} = \frac{500}{2}$

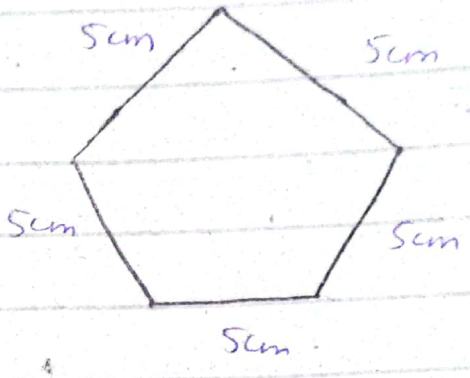
$\boxed{QR = 250km}$ Answer.

(B) Data:

Each Side of Pentagon = 5cm

Perimeter = ??

Illustration = ?



Solution:

Perimeter = Sum of all sides in Pentagon

= 5cm + 5cm + 5cm + 5cm + 5cm

= 25cm

Result:

Perimeter of Pentagon with each side of 5cm is 25cm

Answer

K.W

122.22
9 | 1100

(C) Data:-

Mental age = 11 yrs
Chronological Age = 9 yrs
IQ = ?

Solution:-

$$IQ = \frac{\text{Metal age}}{\text{Chronological age}} \times 100$$

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

$$IQ = \frac{1100}{9}$$

$$\boxed{IQ = 122.2}$$ Answer

(D) Data:

Average age of 3 boys = 15 years
Ratio of their ages = 3 : 5 : 7
Age of youngest boy = ??

Solution:

let the common factor in the ratio of their ages is n

$\therefore \quad 3n : 5n : 7n$

$$\text{Average} = \frac{\text{Sum of age}}{\text{No. of boys}}$$

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

$$15 \times 3 = 15n$$

$$45 = 15n$$

$$n = 45/15$$

$$n = 3$$

So, $3n = 3 \times 3 = 9$

$5n = 5 \times 3 = 15$

$7n = 7 \times 3 = 21$

Age of 3 boys are 9, 15, 21

The age of youngest boy is **9 years**

Answer