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Part-II
Section - I

Q1 (a)

Introduction:

Solid waste management is a system of collection, deposition and dumping off of the waste materials produced in cities and other populated areas. It is necessary for preventing environmental pollution. It is mostly done by metropolitan corporations.

Methods employed in solid waste management:

The following method are employed in dealing with solid waste

Collection of the waste:

The foremost step is the collection of waste across the city on a metropolitan area with the help of collection vehicles such as

trucks, rickshaws etc. A skilled labour carry out these activities. by using different equipments and with the help of machinery.

Deposition of the waste:

The collected waste is brought to a single point present in the city. Here all the wasted is collected which being brought with the help of different vehicles. The next step here is to sort out "recycleable waste" which is sent to different industries for recycling. The rest of the waste is processed for dumping off.

Dumping off or decomposition of the waste:

Different methods are used to treat the solid waste for example, dumping off in the ground, incineration, and

mixing with the soil.

Animal and plant related waste or inorganic waste is usually mixed into the soil in agricultural lands to increase the fertility of soil.

Precautions: Dumping off should be done far from the populated areas and from ~~Conclusion~~ arable lands because it may lead to risks for the human population and soil infertility. Similarly, solid waste should be handled ~~with~~ by following the SOPs, failing to it will lead to hazardous risk for the labour and environment as a whole.

Conclusion:

Hence, solid waste management is method of collection to dumping off of the hazardous waste. It is done by private companies or by government departments.

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Q 4 (b)

Introduction:

Heart is a major organ in human body. It is a muscular organ. Heart plays a vital role in human blood circulation system

Working of human heart:

Heart is a vital organ, which plays a major role in oxygination of blood.

Blood:

Blood is made up of plasma 55% and 45% of blood cells. e.g Red blood cells, white blood cells etc. Blood plays a major role in transportation of vitamins, mineral and gaseous exchange in different parts of the body

Function of veins, arteries and cappilaries:

Heart carries blood to and from the body with the help of a
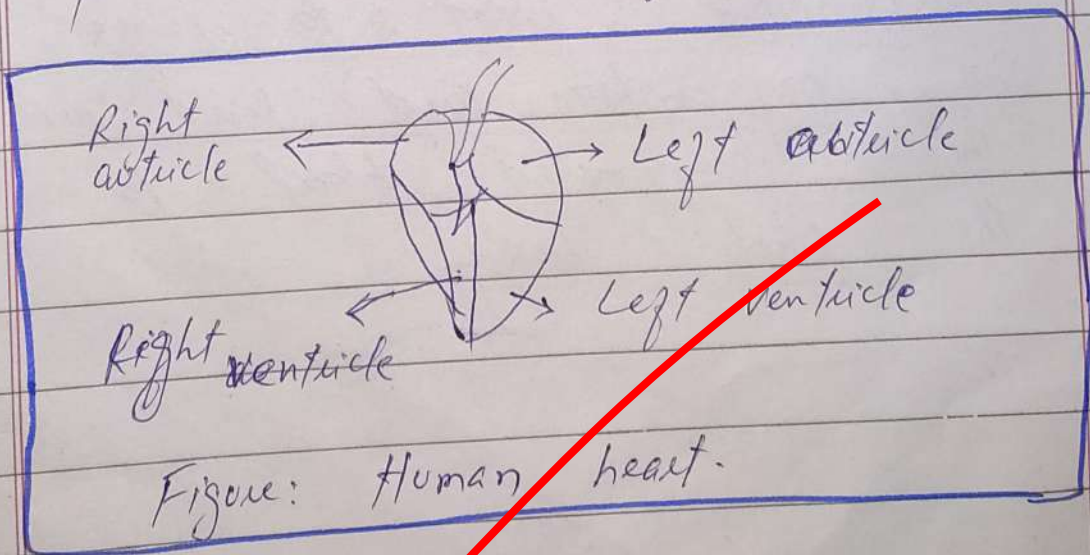
network of veins, arteries and cappilaries.

The veins carry deoxygenated blood from the body to the heart except the plumonary vein and arteries carry oxygenated blood from the ~~body~~ heart to the body except plumonary artery.

Heart and its parts: and their function:

Heart is made up of four chambers.
i) Right auricle, ii) right ventricle
iii) Left auricle iv) left ventricle
It has also some valves to prevent the back flow of blood.

Right auricle ← [heart diagram] → Left auricle

Right ventricle ← [heart diagram] → Left ventricle

Figure: Human heart.

Function of heart:

The deoxygenated blood enters

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vana cava which deliver blood to right auricle and right auricle transfer blood to right ventricle. It then transfer blood to lungs through pulmonary artery. The oxygenated blood is then transfered by lungs to left auricle. Left auricle send blood to left ventricle. From the left ventricle the oxygenated blood is transfered back to the whole body.

Conclusion:

Thus, heart is a major muscular organ of the human body. It's function is to send deoxygenated blood to lungs for oxygenation and send back the oxygenated blood to the whole body

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(d) & (c)

Introduction:

Myopia and Hyperopia are conditions of human eye in which one cannot not see things either at long distance (Myopia) or at short distance (Hyperopia).

Myopia :or Short sightedness

Myopia is the condition of eye, in which a person is unable to see the distant objects clearly. It is because the light is not accurately focused on the Retina in human eye. The causes of Myopia are genetic, disease based etc.

However, though using concave lens we can fix the issue of Myopia in patients-

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Hyperopia: Or far-sightedness

Hyperopia is a condition in which a man is unable to see the nearby objects but he can see the objects at a distance. The major reason is that, the light is focused behind the ratina in the eye. However, by using convex lens the problem can be solved.

Major parts of human eye:

Cornea

Iris

pupil

Ratina

Seclera

Newe tissues

Conclusion:

Myopia and Hyperopie are conditions of human eye in which a patient can not see near objects in the case of far sightedness and cannot see distant objects in case of myopia.

Q4 (d)

~~Introduction~~

Microwave and its uses

These are types of $\land$ waves which are used in:
electromagnatic

For cooking purpose:

Microwaves have high penetration power or high frequency therefore, used for cooking purpose. These waves enter into the food and heat it untill it is ready for eating.

Used for communication purpose

Microwaves are also used for communication purposes. For example, used in satellite system for communication between radar and a satellite.

There are other uses of microwaves as well.

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ii) X-Rays uses:

X-rays are electromagnetic rays which are used for the following purpose:

Medical uses:

In Medical sciences, x-rays are used to diagnose diseases and fractures in the bones. These rays have high penetration power.

Security purpose

X-rays are also used for security purposes among other uses. These are used in scanners at the airports or official buildings to detect objectionable and harmful objects.

iii) Uses of Ultraviolet rays:

Uses in Communication:

Ultraviolet rays are used for communication purposes for a shorter distance for instance, used in tv remotes etc.

Carrying Sun's energy to earth:

Ultraviolet rays also carry sun energy to the earth. Hence, a major source of energy carrier.

Uses in remote sensing:

Ultraviolet rays are also used in remote sensing. In this phenomenon, a remote sensor through light on an object to collect data. Here the source of light are ultraviolet rays. Which carry light towards the object and and reflect back to the source i-e remote sensor. In this remote sensing collect data from the reflected ultraviolet rays.

Q5 (a)

Introduction:

Food preservation is a method of storing food for a long time. Through food preservation, the shelf life of food is increased.

Methods of food preservation:

Following methods are used in food preservation.

Refrigeration:

Many bacteria cease to act at a lower temperature. Therefore, food is freezed which increases shelf life of food. It maintains the taste of food.

Canning:

Canning is another method of food preservation. In this method food is usually stored in tin boxes. In this way the food is prevented from microorganisms which increases

it's shelf life.

Pasteurization:

In this method food materials especially liquids are boiled to kill the microorganisms. e.g many bacteria are killed at 100℃. So, pasteurization helps to keep food preserved for longer duration.

Dehydration:

In this method food, usually, meat like products are dried under the sunlight. Dried food is free from moisture therefore microbes are unable to propagate themselves and food is preserved for longer period.

Packaging

Packaging of food is also a method of food preservation. Here the food is packed in boxes etc which protect them from damage during transportation and also protect them from microbial activity.

Application of chemicals: Additives

Food preservation also include additive usage. For example, salt and sugar

are added into the food to increase its shelf life and protect it from microorganisms.

Transformation of food products into different forms.

Moreover, food is also processed to enhance their shelf life. For instance, tomato is transformed into tomato ketchup, fruits into Muraba, juices etc. It helps to enjoy the food in off season.

Conclusion:

Food processing is a method to increase shelf life of food by preventing it from physical and microbial activity damage through canning, pasteurization, refrigeration etc.

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Q5 (b)

Introduction:

Milky way is the name of galaxy in which earth's solar system moves.

what is Milkyway?

There are thousands of galaxies in the ~~solar system~~ universe and each galaxy consists of hundreds of solar systems. Milkyway is a galaxy in which our solar system functions.

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Relationship of Dark matter with glaxies:

Dark matter is made up of non bonding objects therefore, it can not be seen yet. The dark matter and galaxies are both cosmological objects

However, with the passage of time and after the big bang, some of the energy has united to form galaxies, solar system etc but 74% of energy is dark matter which due to non-bonding, is still not formed.

parts of galaxies:

There are different types of galaxies, For example, Disc shaped, mound etc.
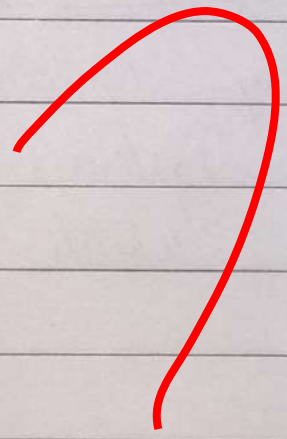
Conclusion:

Galaxy is a cosmological object and milky way is a type of galaxy in which earth's solar system works.

Q5 (c)

Introduction:

Solar and lunar eclipses are phenomenos in our solar system. It is the darkness of one body due to the other.

Difference between solar and Lunar eclipse:

Here are the following differences b/w solar and lunar eclipses.

Solar eclipse:

When moon comes in between of earth and the sun it is called solar eclipse. The moon halt the light of sun reaching to earth which causes darkness on earth.

Bodies involved:

Sun, moon and earth. Here moon comes in between sun and earth.

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Causes:

The main reason is earth's revolution around the sun. During the revolution a period comes when moon comes between sun and earth.

Types:

solar eclipse has following types

a- Total solar eclipse:

when moon come directly in between earth and sun, barring complete flow of sunlight to earth.

b- Partial solar eclipse:

when moons comes partially between sun and earth, leaving some sunlight to reach earth.

Lunar eclipse:

Luna means moon. The eclipse in which earth comes in between sun and moon, leaving moon in darkness.

Types of Lunar eclipse:

Lunar eclipse occues in following types.

a- **Partial lunar eclipse:**
When earth does not come directly between sun and moon, leaving some light to reach the moon.

b- **Total lunar eclipse:**
When earth comes directly between sun and moon, leaving moon in a full darkness.

Conclusion:

Solar and lunar eclipses are darkness of one body due to the interference of another body. Here sunlight is either halted by moon or earth to reach them respectively.

Q5 (d)

Nuclear Fission:

Nuclear fission is a reaction where bigger nuclei split into smaller nuclei to release energy. When nuclei breaks it releases energy. For example, atom bombs are made using this phenomenon, where a small bomb after dropping split into smaller nuclei and release energy which damages everything.

Nuclear Fusion:

Nuclear fusion, on the other hand, is joining of smaller nuclei into bigger one, forming a large nuclei with high energy. For example, stars and sun produce energy through fusion reaction.

Ionic bond in table salt:

Ionic bond is the complete share of electrons from one atom or ion to the other. For example in NaCl.

In NaCl the chlorine atom shares it electrons, ~~completly~~ present in the outer most shell, completely to sodium Na. In this way due to extra electrons Na+ has positive charge and chlorine has negative charge Cl.

Conclusion:

Nuclear fusion and fission are processes of energy production. In former smaller nuclei get together to form a larger one and in latter larger nuclei split into smaller.

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Section - II

Q6 (a)

Solution:

Given data:

Three candidate received votes = 15000,

10000 & 8000

Percentage of total votes of winning candidate = ?

To find total number of votes = A+B+C

$$15000 + 10000 + 8000 = 33,000$$

Winning candidate votes = 15000

His percentage = $\dfrac{\text{obtained votes}}{\text{Total votes}} \times 100$

$$= \dfrac{15000}{33000} \times 100$$

vote Percentage of winning = 45.4 %

Candidate.

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Q6 (b)

Given data:

Ratios of angle of triangle = 3 : 4 : 5

Find each angle = ?

Solution:

Adding the total ratio = 3 + 4 + 5

$$= 12$$

Now finding $\frac{angle:}{ratio}$ ~~of each~~ angle

Total degree of a triangle = 180

So, angle $A = \dfrac{3}{\cancel{12}} \times \overset{15}{\cancel{180}}$

$$\boxed{A = 45°}$$

Angle $B = \dfrac{4}{\cancel{12}} \times \overset{15}{\cancel{180}}$

$$\boxed{B = 60°}$$

Angle $C = \dfrac{5}{\cancel{12}} \times \overset{15}{\cancel{180}}$

$$\boxed{C = 75°}$$

Q6 (c)

Solution:

Given data:

Each group consists = 4 boys + 6 girls

Total girls available = 102

First find the groups to be formed =

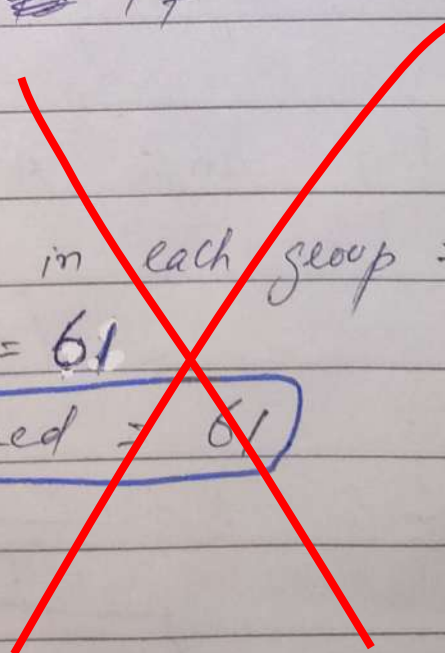$$= \frac{\text{Total girls}}{\text{Required girls per group}}$$

$$= \frac{102}{6}$$

Total groups to = 17
be formed

Now boys required in each group = 4

so   4 × 17 = 61

[Total boys required = 61]

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Q8 (a)

Solution

Given data:

Sum of Three Consecutive odd numbers = 273

Dividing this number with 3

$$= \frac{273}{3}$$

$$= 91$$

[So, the numbers are 89, 91, 93]

Q8 (b)

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

Solution:

The seres can be breaked as:

$$2^2, 4^2, 6^2, 8^2, \dots 10^2, 12^2$$

Its square of even numbers starting from 2.

So, the answer is $10^2 = 100$

[seres will be 4, 16, 36, 64, 100, 144]

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

Solution:

In this series ~~one~~ subtraction is done from the next number, from first number e.g. $30 - 1 = 29$ then $29 - 2 = 27$

So the series will be =
30, 29, 27, 24, 20, 15

iii)   1, 7, 15, 25? 51

Solution:

In this series even numbers are added to the next number, even numbers are starting from $6 =$ e.g. $1 + 6 = 7$, $7 + 8 = 15$ so, the series will be =

1, 7, 15, 25, 37, 51

iv)   Solution

In this series even numbers starting from 2 onwards are added to the next number

$0 + 2 = 2$, $2 + 4 = 6$

so the series will be

$0, 2, 6, 12, 20, 30, 42$