PART II
SECTION-I

Q2:

(a)   Malnutrition

Malnutrition is a condition when there is excess or deficiency of nutrients in the body. Often malnutrition is used when there is deficiency of nutrition, however, for that more specific term is is undernutrition. The biological system of our body requires balanced diet i.e a diet that is sufficient in amount for proper growth, developement of body's muscles, tissue and proper regulatory functioning of body. Balanced diet includes macronutrients i.e those nutrients which are required in larger quantity such as carbohydrates, proteins and fats and micronutrients i.e those nutrients which are required in smaller quantity such as vitamins, minerals etc. When any of the diet is taken in excess or deficient, body's functioning is impaired, as a result with passage of time signs appear physically such as weighloss, hairfall, frequent infection, delayed wound healing, longer durations required for recovery, depression, anxiety, weakness, muscle fatigue, muscle cramps, headache etc. Severe deficiency can produce even drastic consequences such as death.

Amount of nutrition required by body varies from person to person according to their weight, age, height, daily activities, or occupation, any underlying illness etc.

Causes Of Malnutrition

Malnutrition is more common in under-developed and developing areas of the world especially due to poverty. Following are some causes listed;

(i) Reduced dietary intake

(ii) Increase utilization by the body

(iii) Reduced absorption by the body

(iv)

Reduced dietary intake is one of the most common and important etiological factor of malnutrition. This may be due to poverty, unavailability of food, or consumption of repeatedly same food everyday that may fulfil the apetite but doesn't accomplish body's needs. Another factor is reduced absorption and reabsorption of nutrients inside the body. It occurs due to underlying gastric or intestinal problems such as deficiency of intrinsic factor causes pernicious anemia or celiac disease in which intestinal villi are lost which are important for food absorption, there may be some other factors like intestinal surgeries, other abdominal surgeries that severely effect process of absorption. Malnutrition can also be consequence of increased utilization by the body, more than normal requirement of body. This may happen due to some normal conditions such as during growth of baby or lactation of by mother or increased utilization can also

appear due to under-lying diseases, major trauma or burns etc. These all factors highlight root causes of malnutrition, a deadly disease for thousands of newborns.

Consequences Of Malnutrition

Consequences of malnutrition can vary from mild symptoms to severe conditions of body. It effects every organ of the body including muscles, bones, lungs, heart, GIT, kidneys, hairs, skin, nails, etc. Every system of body gets shadow of malnutrition

Weight loss: Depletion of fat and muscle mass, is the most obvious sign of malnutrition. In children it appear as Cachexia ~~Cachexia~~ and Kwachoiker. Initially when food reserves are depleted, fat is utilized for energy requirement, after fat depletion muscle mass is used by body resulting in severe weight loss.

Muscle Function: Muscle function is impaired initially due to depletion of nutrients resulting in cramps, muscular pain, weakness etc. Insufficient dietary intakes results in shutting down of energy dependent cellular membrane pumping mechanism. To meet this requirement, function reserves such as adipose tissue, muscle mass, bones are consumed resulting in alteration of body composition.

Gastro-intestinal Functions

Adequate nutrition is required for proper functioning of body. When nutrients are depleted their alter pancreatic exocrine functions, intestinal absorption mechanism, intestinal blood flow, villous architecture etc. Colon loses its ability to absorb electrolytes and water which may result in diarrhea, which is most important cause of death in severely malnourished patients

Cardio-respiratory system

Heart and respiratory system are the most vital systems of the body which are severely effected due to malnutrition. Their muscular mass may be reduced, severely effecting pumping mechanism of heart. Electrolyte imbalance such as alteration of potassium level can produced irregular heart beat, arrythmias or may be heart attack. Electrolyte deficiencies may also reduce cardiac output, reduced respiratory perfusion, diaphragmatic weakness, increased accumulation of secretion inside lungs etc which may increase spells of infection of respiratory tract.

Immune system

Our defence mechanism is also effected, increasing risk of infection due to impaired leukocyte function, cytokines, complement system, phagocytes, etc. These factors increases risk of infections and delayed healing mechanisms.

Above all were some of the major consequences of malnutrition, that can be addressed with balanced diet. Adequate intake of nutrition can reverse most of the impaired function and helps in maintaining growth, development and normal functioning of body.

(b)

Difference between food contamination and food adulteation

Food contamination is addition of foreign material into the the food, these contaminants are removed during food cleaning or processing. Food contamination may be physical such as hair, dust, metals, soil, plastic, glass or other foreign substances. It may be chemical such as pesticides, insecticides, toxins, herbicides etc or it may be biological such as bacteria, virus, fungi, parasites or other insects. Then comes the term Food adulteation, which is deliberate contamination of food to increase benefits such as addition of contaminated water into milk or addition of soap power, chalk power into milk, brick powder added into chilli power, addition of food colourings into various products to increase their profitability. Injecting watermelons to increase their size, growth and improve their colour etc. These all are acts of adulteation done by seller for their benefit.

(c) Computer Buses.

Computer buses are the parallel lines that transfer ~~trans~~ data between components of computer, or outside computer. Amount of transfer of data depends upon number of data lines in buses. ~~One bus transfers one byte~~ Number of data lines increases capacity of computer buses. A bus with 32 lines carry 32 bytes. This archetechure of computer buses is present inside CPU for communication and transfer of energy. Types of buses may be:

① Data bus

② System bus

③ Control bus

Difference between RAM and ROM

RAM	ROM
• RAM stands for random access memory.	• ROM stands for read only member
• RAM is a volatile type of information that is lost when power is cut	• ROM is a non-volatile memory that is permanant memory holding that remains even power is switched off.
• Contents of Random Access memory can be accessed and proccessed as well.	• Contents of Read Only Memory can only be accessed but can not be processed.

• RAM stores immediate instructions that are required by processor	• ROM contains only boot-up information or instructions for the computer
• RAM allows data to be read and written at the same time irrespective of physical location.	• ROM has gap of time between reading and writing of data due to mechanical gap.
• Examples include CD, DVD, hard hard disk.	• ROM contains non-volatile chips that can not be processed, they are put permanantly inside computer
• RAM has multiple data line to increase its capacity such as 16-lines, 32 lines, 64 lines etc.	the only way to change processing is over-writing through special softwares.
	ROM is necessary for computer functioning so that it knows what to do when computer is switched on, start up instructions, and proper functioning information is inserted.

(d)
Geo- Stationary satellites

Satellites are the machines that are sent into space through rockets, these machines spin around planets or stars. The term of satellite is used for moon, planet or machine orbitting the star or any planet. Geo-stationary satellites are those machines which orbit in from west to east over the equator. It looks still or stationary because it travels at the same rate of as that of earth and in the same direction as that of earth. These satellites are moved into the orbit when gravitational force of earth balances it to keep satellite there, if satellite is moved from the particular orbit it will either fall into space or fall back on earth. Geo-stationary Satellites are mostly used as communication satellites or weather satellites to keep them permanantly in sky and they appear motionless despite the fact that they are in motion.

Difference between Natural and Artificial satellite.

Natural satellites are naturally present in space orbiting since millions of years such as moon, ~~earth~~ revolving around earth, earth revolving around sun, several moons orbitting several planets these all are natural satellites. Whereas, artificial satellites are machines

sent through rockets by human beings into the space such as communication satellite, weather satellite, Navigation satellite, astronomical satellite and earth observating satellite etc. These all have specific function such as global positioning system (GPS), observe clouds, rainfalls, weather prediction, making phone calls, internet, networks, monitor space and take detailed photographs of space etc.

Jupitor has one artificial space aircraft named "Juno" sent by NASA for detailed study of Jupitor.
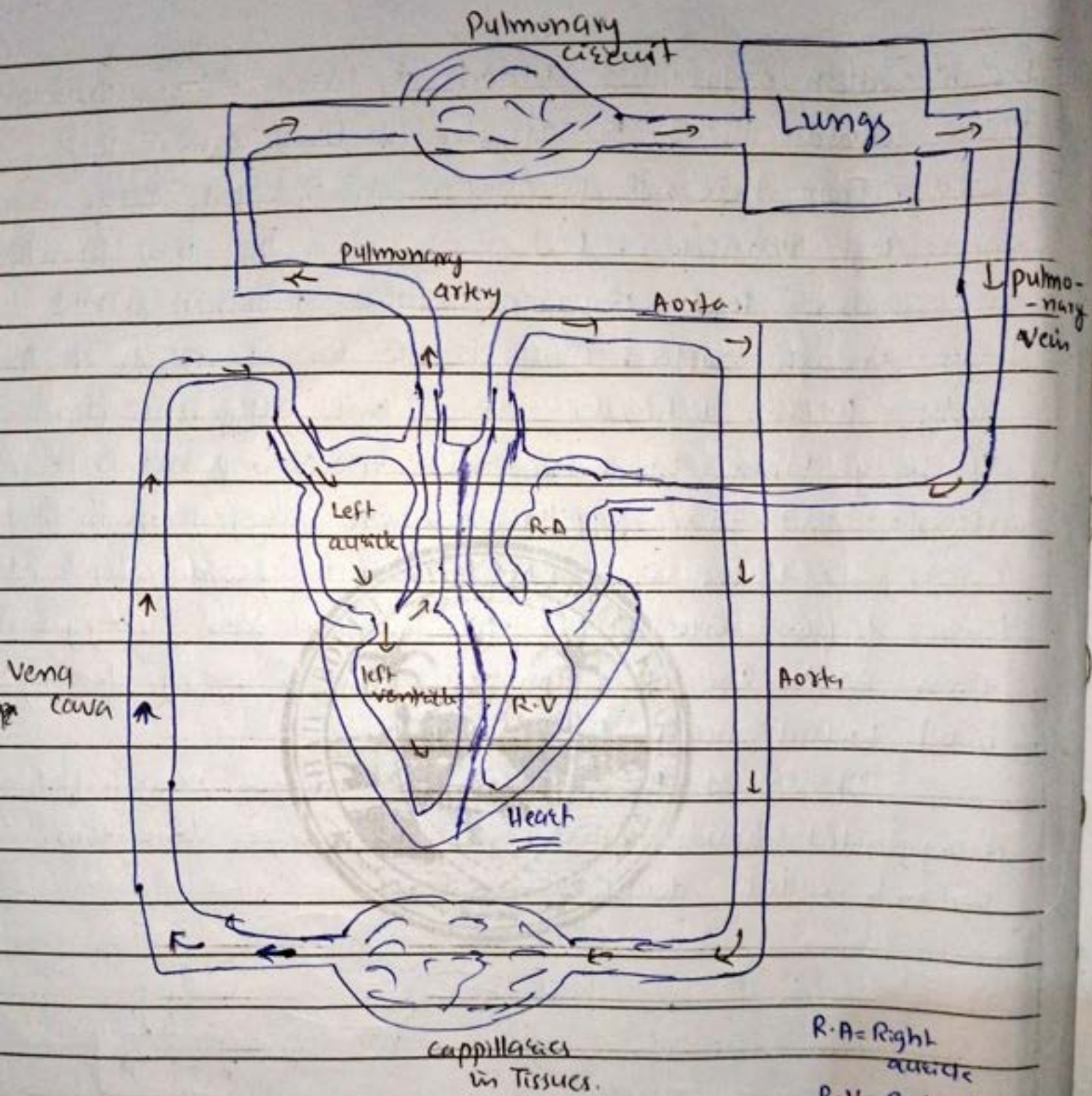
QB

9. ## Double Circulation of Heart.

Human heart has double circulatory system because blood flows inside and outside the heart twice during single passage of blood into body and heart has 2 separate circuits for oxygenated and deoxygenated blood. Circulatory system consist on major three components.

① Blood

② Blood vessels

③ heart.

Blood is the fluid that contains plasma and blood cells. blood vessels are passage lines in which blood flows through the whole system and Heart is the major circulatory organ. Heart consist of four chambers Right and left auricles and Right and left ventricles. Initially deoxygenated blood from all parts of body is concentrated in vena cava, the largest vein of body. Vena cana brings deoxygenated blood into right auricle. From right auricle blood passes through tricuspid valve into right ventricle, from where it is taken by pulmonary artery towards lungs. Lungs carry out oxygenation of blood where Oxygen (O_2) enter and Carbon-dioxide leaves the blood. Then,

bright reddish oxygenated blood is taken through pulmonary veins towards heart. the oxygenated blood enters left auricle. From here, it passes through bicuspid valve and enters left ventricle. Left ventricle is the most muscular chamber that pumps blood towards whole body through aorta. Aorta is the largest artery of the body which distributes blood into different parts of body. When blood reaches arteries, passes into arterioles and then cappillaries, here oxygen from blood enters into tissues and carbon dioxide from cells and tissues diffuses into blood converting it into deoxygenated form. Again, the cycle continues by bringing deoxygenated blood toward heart.

It showed the separate circuits for oxygenated and deoxygenated blood which flow in separate lines this system is called double circulation.

Pulmonary circuit

Lungs

Pulmonary artery

Aorta.

pulmo--nary Vein

Left auricle

R-A

Vena cava

left ventricle

R-V

Aorta

Heart

cappillaries in Tissues.

R·A = Right auricle
R·V = Right ventricle.

Double Circulation. Of Heart.

(b)

Liver is a chief chemist

Liver being the largest gland of body is also considered as a chief chemist. It is the centre of metabolism where synthesis of proteins, carbohydrates, fats and other compounds takes place. Other significant functions like detoxification of toxins, degradation of complex compounds, production of bile, digestion, immunity, vitamin storage etc. liver is called chemical factory because more than 500 chemical functions are carried out by liver. It produces enzymes, chemicals, clotting factors, Albumin, globulin, lipoproteins etc. It produces bile which helps in digestion of fats. It detoxifies waste from body such as drugs, alcohal, toxins, ammonia, allergens etc. It act as storage source for vitamins, glycogen etc. liver has capacity to regenerate itself. Due to its diverse functions it is known as Chief chemist of the body.
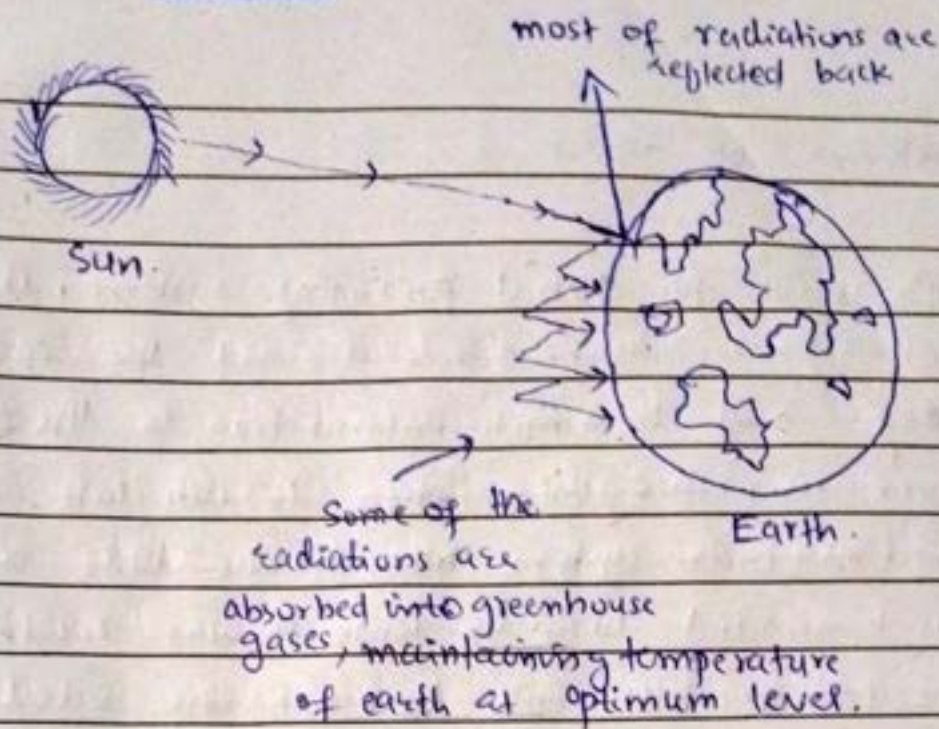
(c) Greenhouse effect is a blessing

Greenhouse effect is a natural process on earth which insulates the earth from freezing temperature. It is a process when sun radiations reach the earth atmosphere, those radiations are absorbed by greenhouse gases which retain sun's radiation on earth keeping a balance of temperature on earth surface, which is average temperature for human beings to survive. Without greenhouse effect earth could have reached temperature of $-18°C$ which could halt survival of living organisms.

Rise of population in the world has immensely increased human activities such as burning of fossil feuls, excessive release of greenhouse gases, over-release of chloro-flouro carbon (CFCs) in the atmosphere which has significant role in breaking of ozone layer. These all factors have increase greenhouse effect which seemed a blessing in critical times but now it is contributing to increased temperatures on earth known as Global warming. It is addition of carbondioxide and methane into the atmosphere which has risen atmosphere of earth by $1.5°C$ since the industrial revolution.

Greenhouse Effect

most of radiations are
reflected back

Sun.

Earth.

Some of the
radiations are
absorbed into greenhouse
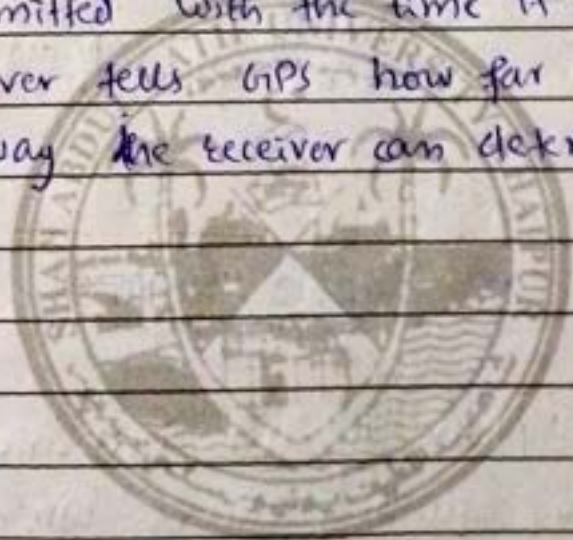gases, maintaining temperature
of earth at optimum level.

(d)

(b) ## Working of Mobile Phones

A mobile phone is an electronic device that
works over a radio frequency carrier. When you make
a call electromagnetic radiations are released from phone
also known as radiofrequency energy. These radiations are
received by nearest mobile phone towers enter antenna.
Antenna receives those electromagnetic radiations and
transmit them to switching centre which functions
as an exchanger of mobile phones. Here call is connected
to another mobile phone or telephone.

(a) Working of GPS

GPS, stands for global positioning system, it is an artificial satellite that orbits around the earth twice a day and transmits information to the earth. GPS receiver uses this information to calculate user's exact location. GPS system measure the time a signal was transmitted with the time it was received. This time receiver tells GPS how far the satellite is. In this way the receiver can determine user's position.

SECTION - II

Q6:

(a) Solution

No. of pupils in 2022 = 850. → ①

No. of pubils in 2023 = ~~1150~~ 1120 → ②

Increased percentage for enrollment = ?

Total increase in no. of pupils are:
Substrate eq ① from eq ②

$$1120 - 850 = 300 → ③$$

To find percentage of increased enrollment

$$Percentage = \frac{Given}{Total} \times 100.$$

$$\%age = \frac{300}{850} \times 100.$$

$$\boxed{\%age = 35.29\%}$$

So, there is 35.29% increase percentage for enrollment.

(b)

Data

let age of ~~men~~ son be = x

age of his ~~son~~ father = $5x$

Two years ago; their age was;
$$x^2 + (5x)^2 = 114 \longrightarrow ①$$

present age of his sun= ?

Solution

lets find value of x from eq: ①

$$x^2 + (5x)^2 = 114$$
$$x^2 + 25x^2 = 114$$
$$26x^2 = 114$$
$$x^2 = \frac{114}{26}$$

$x = \sqrt{10.87}$ $x = \sqrt{4.38}$

$x = 3.29$ $x = 2.09$

present age of sun = $2.09 + 2$
$$= 4.09 \text{ years}$$

So, current age of his son is 4.09 years.

(c)

    no. of heads = 48

    no. of feet = 140

Let 'x' be no: of hens and 'y' be no. of cows.
So, total no. of heads are;
$$x+y = 48$$
$$x = 48-y \longrightarrow ①$$
total no: of feet are,
$$2x + 4y = 140 \longrightarrow ⑪$$

Put value of 'x' from eq① in eq⑪

$$2x + 4y = 140$$
$$2(48-y) + 4y = 140$$
$$96 - 2y + 4y = 140$$
$$96 + 2y = 140$$
$$2y = 140 - 96$$

$$y = \quad 2y = 44$$
$$\boxed{y = 22} \longrightarrow$$

To find value of 'x' put value of 'y' in eq①
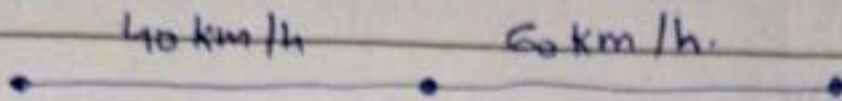
$$x = 48 - y$$
$$x = 48 - 22$$
$$\boxed{x = 26}$$

So, Total no. of hens are 26 and no. of cows are 22

4

(d)

40 km/h   60 km/h.

$V_1 = 40 \text{ km/h}$

$V_2 = 60 \text{ km/h}$

average speed = ?

$$V_{avg} = \frac{V_1 + V_2}{2}$$

$$V = \frac{40 + 60}{2}$$

$$V = \frac{100}{2}$$

$$\boxed{V = 50 \text{ km/h}}$$

Average speed of care is 50 km/h

Q7

(a) let number be x

x is divided by 6 and 50 is added

$$Total = 60$$

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

$$x = ?$$

As,

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

$$\frac{x + 6(50)}{6} = 60.$$

$$x + 300 = 60 \times 6$$

$$x = 360 - 300$$

$$\boxed{x = 60}$$

So, the number is 60.

(b)

series $\rightarrow$ 8, 16, 24, 34, 40, 48.

odd one = ?

$$1 \times 8 = 8$$
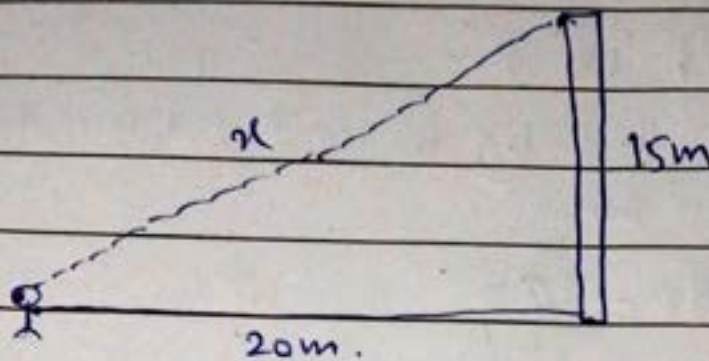$$2 \times 8 = 16$$
$$3 \times 8 = 24$$
$$4 \times 8 = 32$$
$$5 \times 8 = 40$$
$$6 \times 8 = 48$$

As all above numbers are multiples of '8' so odd number is 34

6

(c)

$x = ?$

As it forms right angled triangle

So from pythagoras theorum

$$(Hyp)^2 = (Base)^2 + (perp)^2$$

$$(x)^2 = (20)^2 + (15)^2$$
$$x^2 = 400 + 225$$
$$x = \sqrt{625}$$
$$\boxed{x = 25m} \text{ Ans.}$$

So, aerial distance from top of tower is 25m

(d)

tarrif for odd dates = 1000 Rs
tarrif for even dates = 2000 Rs
Total paid = 30000
Started from = 5th day
Total days = ?