

Mock Exam GSA

Elaborate your answer with diagrams.

QNO. 4

Answer(a)

Hepatitis

Hepatitis refers to the inflammatory condition of liver. It is commonly caused by viral infection but there are other causes of hepatitis.

These include auto-immune hepatitis and hepatitis that occurs as a secondary result of medication, drugs, toxins and alcohols. Auto-immune hepatitis is a disease that occurs when body makes antibodies against liver tissues.

Causes

Hepatitis is caused by virus. This virus is transmitted through contaminated water, food and blood of an infected person.

Hepatitis A is caused by contaminated food, water and direct contact with infected person. It is not severe type of hepatitis and a person infected with hepatitis A can be recovered fully with lifetime immunity. Hepatitis B, C are mild severe acute and chronic hepatitis. It is transmitted through blood, sexual practice and other body fluids. Unsafe injection practice, non-sterilized medical instrument also cause hepatitis C.

Symptoms :-

High fever, headache, joint pain, tiredness, jaundice are the initial symptoms of hepatitis. But when it becomes severe then following symptoms appear:

→ Bleeding disorder

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- Build up fluid in abdomen.
- Hypertention
- Kidney Failure
- Hepatic encephalopathy involve fatigue, memory loss.
- Liver cancer and then death.

Prevention :-

Hygiene practicing, good hygiene is one key way to avoid contracting hepatitis E and A. Hepatitis B, C and D contracted through contaminated blood can be prevented by:

- not sharing drug needles.
- not sharing razors.
- not using others' toothbrush.
- not touching spilled blood.

←—————→
Answer(b)

Methods of Food Preservations :-

Food preservation is a process by which food is

stored in a protective way to control the attack and growth of food borne diseases by microbes and maintain food flavour, texture and nutritive values for a long time. There are many methods to preserve foods.

1. Refrigerating & Freezing :-

At low temperature enzymatic reactions are reduced and lower the growth of microorganisms. This is best for preserving food like eggs, milk, vegetables for some days.

2. Boiling :-

By boiling microorganisms are killed and food is preserved for short time. For example milk is boiled at a certain process and then is cooled quickly.

3. Sugaring :-

Excess sugar is also

a preservative. Foods can be preserved in the form of jams, jellies and murabbas by adding sugars in them.

4- Drying :-

In this method water is dried from food by sun, hot air and food is preserved.

As micro-organisms can not grow in the absence of water and enzymatic reactions also need watery environment.

5- Canning

In this method air is removed and food is preserved in airtight bags or cans. Food is cooked and then packed in sterilized containers. Microbes are killed during the sterilization of containers.

6- Salting and Pickling :-

Salting mean curing the food to remove moisture like meat and pickling means to preserve food in brine or marinate with

vinegar. In Asia, oil is also used to preserve food.

7. Smoking :-

In this process food is cooked, flavoured and preserved by exposing it to smoke from the wood. St. Smoke is antimicrobial and antioxidant. Meat and fish is smoked. Formaldehyde present in smoke act as preservative and heat to dry food.

There are some modern methods also to preserve food.

1. Chemical Additives :-

Food additives are added to food but is toxic when large amount is consumed. It is helpful to maintain nutritive value of food and preserve it. These chemical inhibit and reduce the growth of microbes. So food is preserved. e.g. nitrites and nitrates are used to preserve milk and

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sulphur dioxide is used to preserve fruits and vegetables from enzymatic reactions.

2. Irradiation :-

In this method food is exposed to gamma and X-rays through a chamber. These rays kill the microbes, break chemical bonds and destroy cell membrane and cell wall. It also stop ripening fruits.

3. Pasteurization :-

In this method food is heated to certain temperature for certain time. As a result micro-organisms are killed like in milk and it is preserved.

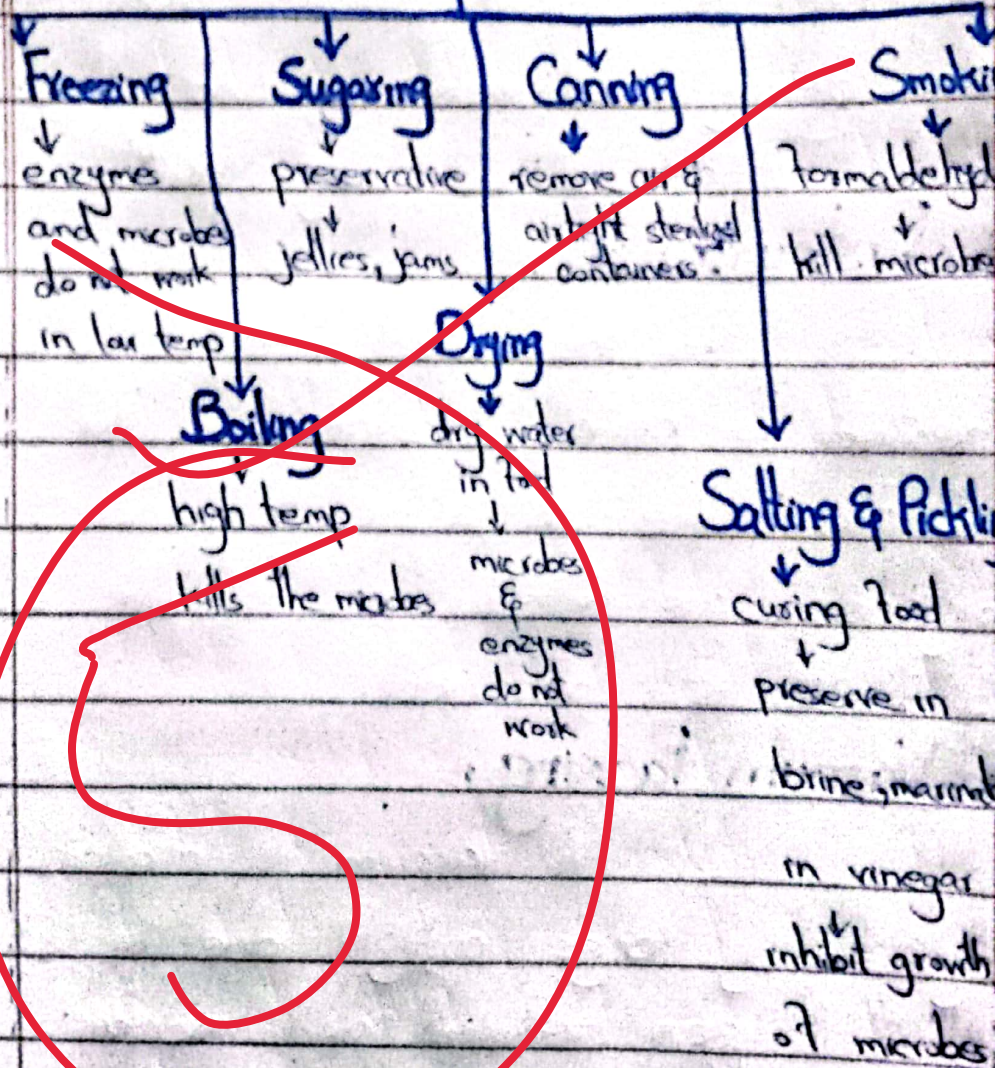
4. Vacuum Packing :-

A vacuum is created by making bags airtight due to which oxygen reduced and microbes die. This is useful for nuts to maintain nutritive value and flavour.

5. Nonthermal Plasma :-

In this technology, surface of food-stuff is exposed to flame of ionized gases like nitrogen and helium. Micro-organisms are killed if present on the surface of food.

Methods



Modern Methods

Food Additives

↓
toxin
kill or suppress
growth of microbes

↓
NO₂ for milk, SO₂
for fruits & vegetables

Vacuum Packing

↓
vacuum created
↓
no oxygen
↓
microbes die
↓
preserve nuts

Irradiation

↓
Food exposed to radiations
↓
break chemical bonds
↓
kill microbes
↓
stop ripening of fruits.

Nonthermal Plasma

↓
Food stuff
exposed to
gaseous plasma
↓
kill microbes

Pasteurization

↓
heat food
↓
high temp
↓
kill microbes
↓
preserve
milk and
fruit
juices

(c)

Fertilizers

Fertilizers are organic or inorganic molecules by nature or synthetic origin, added to soil for supply one or more nutrients that are necessary for plant growth. Fertilizers are chemical substances

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that provide nutrients to plants and crops for their growth. Farmers use fertilizers to gain better crop yield. Fertilizers contain nutrients like sulphur, nitrogen, potassium that play important role in plants development. These nutrients also make soil fertile for crops.

Types of fertilizers :-

There are two types of fertilizers.

1. Inorganic Fertilizers
2. Organic Fertilizers.

Inorganic Fertilizers :-

These are chemical fertilizers that contain nutrients made by chemical means. There are of two types.

a. Nitrogen Fertilizers :-

Nitrogen Fertilizer is essential for development of crops. Nitrogen is the constituent of

chlorophyll that maintain balance during photosynthesis. It make up nucleic acid and constitutes protein. Nitrogen is essential for plant growth and maintain quality of agricultural products.

b. Phosphorus Fertilizers:-

Phosphorus in the polymer of cell help in productivity and proliferation of cell. This fertilizer help in the growth of plant roots.

2. Organic Fertilizers :-

These are natural by plants and animals. These add carbonic compounds to the soil and organic matter of soil make fertile by changing chemical and physical properties of soil. It is essential for green food.

Fertilizers

organic, inorganic
nutrients to soil
for plant growth

Inorganic Fertilizers

chemical fertilizers
↓
nutrients made chemically

Organic Fertilizers

natural
↓
plants, animals
↓
cubane

Nitrogen Fertilizers

↓
nitrogen containing
↓
constituent of chlorophyll,
amino acid, proteins
↓
increase crop production

compound to
soil.
↓
fertile

Phosphorus Fertilizers

↓
in protoplasm and
help in growth
and proliferation
↓
growth of roots



(d)

Anatomy of Human Tooth:-

Human tooth consist of following parts:

1. Tooth Enamel
2. Dentine or Ivory
3. Dental Pulp
4. Cementum
5. Gums.

Tooth Enamel:-

It is the hardest part of tooth and hardest tissue of the body. It protects the tooth called crown. It is inorganic and dead part of tooth.

Dentine:-

It is bony tissues and make much mass of tooth. It supports enamel and absorb pressure of eating. It consists of a number of micro fibers embedded in homogeneous matrix of collagenous protein.

Dental Pulp:-

It is made up of connective tissues and contains nerves and vessels that nourish the tooth.

It is the soft part of tooth and is in the inner side of dentine.

Cementum:-

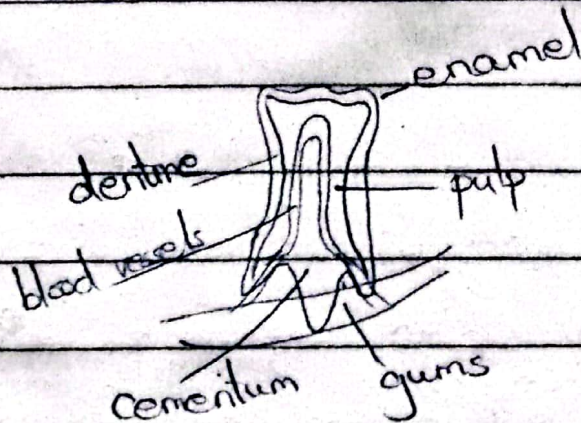
It is outside the root of dentine and has elastic fibres.

It connects the tooth with jaw.

It is hard like bone.

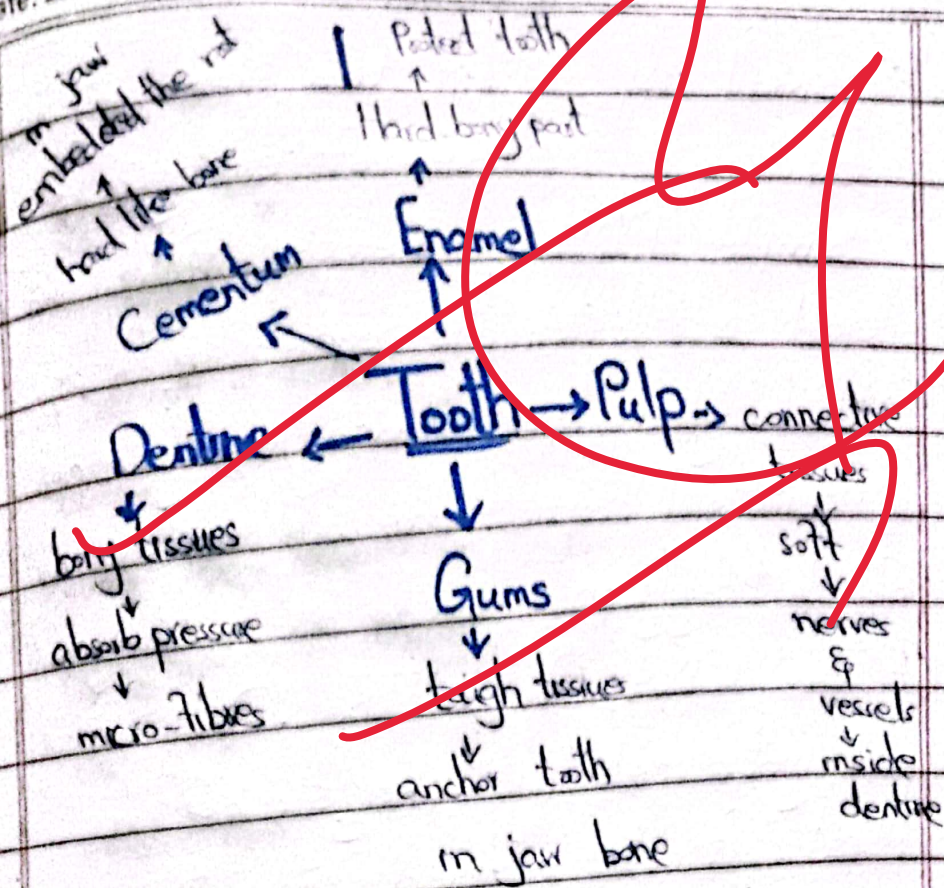
Gums:-

These are tough, reddish tissues that are on the jaws and rooted the tooth in the jaw bone.



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Question No: 5

(a)

Differentiate between eukaryotic and prokaryotic cell:-

Prokaryotic Cell	Eukaryotic Cell
1. have no nuclear	1. nucleus is present
2. no membrane bound organelles	2. membrane-bound organelles are present
3. no inter-cellular division of labour	3. intercellular division of labour is present

4. small in size

4. Large in size of the size of prokaryotic cell

5. Simple DNA and is shorter

5. Complex DNA and is extensive

6. Prokaryotes have a cell wall composed of peptidoglycan.

6. many eukaryotic cell are not made of peptidoglycan

7. The DNA of prokaryotic cell floats freely in the cell

7. The DNA of eukaryotic cell is held within the nucleus and is associated with histones.

8. Prokaryotes divide by binary fission (simple cell division).

8. Eukaryotes undergo mitosis.

9. All Bacteria are prokaryotes.

9. Animals, plants, fungi all are eukaryotes.



(b)

Global Warming :-

The recent and ongoing ^{average} rise in temperature across the globe near the earth surface is called global warming. Global warming is harmful as it is causing climate patterns to change. Burning of fossil fuels is the largest source of CO_2 emission, that is the main cause of greenhouse effect and contribute to rise in average temperature leading to global warming.

Kyoto Protocol :-

Kyoto Protocol is an international treaty that was adopted in 1997 in Kyoto, Japan with the goal of addressing global climate change by reducing greenhouse gas emissions. It aimed

to stabilize the concentration of these gases in the atmosphere at a level that would prevent dangerous human interference with climate system.



(c)
GIS

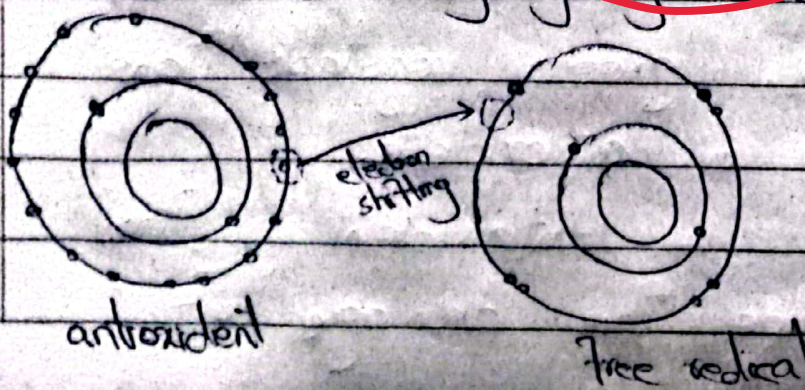
Geographic information system is a computer-based tool for mapping and analysing spatial data. GIS technology refers the common database operations like query and statistical analysing with acute visualization and geographic analysis benefits drawn by maps. These abilities indicate that GIS is an important system to a wide range of public and private enterprises to maintaining, predicting outcomes and planning strategies. GIS is an important technology

that potential the revolutionized aspects of society with increased abilities with decision making and problem solving. It is all about capturing data.



(d) Antioxidants :-

Antioxidants are compounds that inhibit oxidation. The oxidation damage the cell membrane and other structures of cell like proteins, lipids and DNA. When oxygen metabolized, it form free radicals. (Antiox) These free radicals steal electrons from other molecules and cause damage. Antioxidants neutralize these free radicals by giving electrons.



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The human body needs a balance between free radicals and antioxidants. If it disrupted then cause oxidation stress. When free radicals are overloaded then damage is irreversible and cause diseases like blindness, heart disease, cancer, ageing, inflammation of joints. By ageing the ability to compete the effects of free radicals decrease, free radicals increases, oxidation stress also increases causing disease.

Sources:-

Food rich in antioxidants reduce the risk of damage. These antioxidants neutralize the free radicals of oxidation. Grapes, blueberries, redberries, nuts, green vegetable^{ies} are rich in antioxidants.

Antioxidant in food reduce the damage of

of free radical by neutralizing them. Nutrients like vitamin A, C, K, minerals like zinc, selenium act as antioxidants. In dietary food phytochemicals like phycoene in tomatoes and anthocyanin in cranberries are antioxidants. Principal antioxidants are butylated hydroxyanisole (BHA), butylate hydroxy toluene (BHT) and tertiary butylated hydroquinone (TBHQ) etc.

←————→

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(a) Identify missing number :-

(i)

13, 24, 46, 90, 178, 354.

$\begin{array}{cccccc} \vee & \vee & \vee & \vee & \vee & \\ \hline & +22 & +44 & +88 & +176 & \end{array}$

In this series the difference between two numbers is added as eleven multiply with two then becomes next difference 22.

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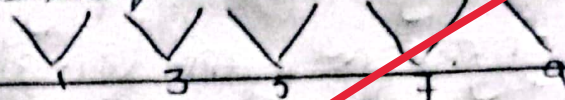
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which is further multiplied
by 2 and so on.



ii)

5, 6, 9, 14, 21, 30



This series follow the
odd number pattern to give
final number 30.



(a)

Suppose:

a is hundred digit

b is tens digit

c is unit digits.

Then sum of 3-digit number
is 15.

$$a + b + c = 15 \rightarrow (1)$$

As sum of 10th and unit
digit number is 12. So

we can write as

$$b + c = 12 \rightarrow (2)$$

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As difference between ~~hundreds~~ and ^{and tens} unit digit is 2

So,

$$c - b = 2$$

$$c = b + 2 \quad \text{--- (3)}$$

By putting the value of 'c' in eq. (2)

$$b + c = 12$$

$$c = b + 2$$

$$b + (b + 2) = 12$$

$$c = 5 + 2$$

$$2b + 2 = 12$$

$$c = 7$$

$$2b = 12 - 2$$

$$2b = 10$$

$$b = \frac{10}{2} = 5$$

Putting the values of 'b' and 'c' in eq. (1)

$$a + b + c = 15$$

$$a + 5 + 7 = 15$$

$$a + 12 = 15$$

$$a = 15 - 12$$

$$a = 3$$

$$(a + b + c = 15)$$

So three-digit number is 357.

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(c)

$$d = 6 \text{ cm}$$

$$\text{Circumference} = C = \pi \times d$$

$$= 3.14 \times 6$$

$$= 18.84 \text{ cm}$$

$$\text{Area of circle} = A = \pi \times r^2$$

$r =$ radius

$$r = \frac{d}{2} = \frac{6}{2} = 3 \text{ cm}$$

$$A = \pi r^2$$

$$= 3.14 \times (3)^2$$

$$= 3.14 \times 9$$

$$= 28.26 \text{ cm}^2$$

(b)

Ratio is

2:3:4

Total slices = 18

$$2x + 3x + 4x = 18$$

$$9x = 18$$

$$x = \frac{18}{9} = 2$$

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$$\text{Small pizza slices} = 2x = 2 \times 2 \\ = 4 \text{ slices}$$

$$\text{medium} = 3x = 3 \times 2 \\ = 6 \text{ slices}$$

$$\text{large} = 4x = 4 \times 2 \\ = 8 \text{ slices}$$

$$\text{weight of small pizza} = 4 \times 40 \\ = 160g$$

$$\text{" " medium} = 6 \times 40 \\ = 240g$$

$$\text{" " large} = 8 \times 40 \\ = 320g$$

$$\text{Total weight} = 720g$$

$$\text{Price of small pizza} = \frac{320}{4} =$$

$$= 80 \text{ Rs per slice}$$

$$\text{price of large medium pizza} = 6 \times 80 \\ = 480 \text{ Rs}$$

$$\text{" " large} = 8 \times 80 \\ = 640$$

$$\text{Total price} = 1440 \text{ Rs}$$