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(GSA) - Part - II

(Q no. 2) (a) The statement that the doctors will start relying more on nutrition rather than drugs reflects a perspective that emphasizes the importance of nutrition in healthcare and suggests a shift towards more holistic and preventive approach to medicine. The idea seems somewhat idealistic but it does highlight some important points that are given below:-

Prevention vs. Cure:-
Importance of nutrition and highlighting the timeless "Prevention is better than cure" statement directly helps us understand the importance of nutrition in healthcare. By provision of sufficient nutrients to the body, one can keep themselves safe from many chronic diseases, such as obesity, diabetes, heart diseases etc. It can also lead to prevention of these diseases in the first place if healthy eating lifestyles are promoted.

Role of nutrition in health:-

Nutrition plays an important role in overall well-being since it provides the body with many essential nutrients. The deficiency of these nutrients can lead to many

General Instructions

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.
3. Do not use table for comparison and contrast questions.
4. Draw figures/diagram/flowchart where needed.

5. Start new question from fresh page.
6. Write unit of the answer in ability section.
7. Explain mathematical steps and the reasoning for better score.

8. Change colour scheme for references to give them more visibility.
9. Manage time well.

10. Wide page borders are discouraged.

Should be reasonable

11. Avoid writing wrong references.

12. Give more weightage to expressedly asked part/s of the question.

health problems which can be avoided by use of the nutritionist approach.

Complementary approach:-

We don't necessarily have to think about nutrition and drug use in health as opposing forces or competing phenomena. They can both complement each other as well. Just as nutrition is important to prevent diseases and to strengthen the immune system, some drugs are also vital to save patients from terminal/non-terminal illnesses that may arise due to environmental or other inevitable factors.

While the statement suggests that nutrition will play the central role in healthcare, it's important to recognize that pharmaceuticals will continue to be the focus when we talk about diseases that make use of the significant strides that drug therapies and other medicinal management systems have made.

(Q2)(b) Composting, incineration and pyrolysis are waste management techniques for different types of solids. All of these techniques have

their unique advantages, terms of procedure and environmental impacts. Each of these processes (2) are discussed separately below:-

Do not use tables for comparison.

Composting

→ It is a biological process that involves decomposition of solid waste.

→ Used for organic wastes such as foodscrap, yard waste & agricultural residue.

→ It is an environmentally friendly and stable method and it has minimal environmental impacts.

Incineration

→ A thermal treatment process that involves burning solid waste at high temperatures in controlled environment.

→ Includes treatment of municipal solid waste and other hazardous waste, etc.

→ It has environmental concerns such as air emissions (including pollutants and greenhouse emission gases) and the need for proper waste sorting.

Pyrolysis

→ Thermal treatment process where waste is heated, in the absence of oxygen, leading to breakdown.

→ Used for waste like plastic, rubber & certain hazardous materials.

→ Less environmentally ~~friendly~~ ^{damaging} than incineration and has some benefits as well, such as waste reduction, energy recovery.

In summary, composting is a biological process, incineration is heat treatment with oxygen and pyrolysis is heat treatment without oxygen. The choice of waste management methods depends on the type of waste, environmental factors and desired utilization outcome.

(Q2)(c):- Role of kidneys in urine formation:-

Kidneys play a crucial role in the formation of urine as part of the excretory system. The steps involved in this physiological process are :-

(i) Filtration:-

Blood from renal arteries enters the nephrons where it is filtered under pressure through a cluster of capillaries called glomerulus.

(ii) Reabsorption:-

Filtrate enters renal tubules where reabsorption begins. Selective transport of glucose, filtered water and other essentials is carried out back into the blood stream.

Functions of parts of kidney are missing.
Add diagram

(iii) Secretion:-

Renal tubules actively transport toxins from blood stream to tubules. Body's pH is regulated and maintained here.

(iv) Concentration & dilution:-

Depending on body need or hydration status, loop of Henle produces urine that is either concentrated or diluted.

(v) Formation of Urine:-

These processes continue to modify the composition of the filtrate and it eventually enters the renal pelvis and flows to ureters and stays there until elimination.

In short, kidneys play a vital role in ⁽³⁾ urine formation by filtering blood to remove waste products and excess substances. The formation of urine is a highly regulated and dynamic process that is essential for the establishment of homeostasis and elimination of metabolic waste from the body.

Q2)(d) N-type S.C

- Majority charge carriers are electrons, with few holes or vacancy.
- Achieved by introducing impurity called donor impurity.
- Examples include P, As, Sb added to Ge or Si.

P-type S.C

- Majority charge carriers are holes or vacant electron positions.
- Achieved by introducing impurity called acceptor impurity.
- Examples include B, Al, Ga.

The interaction of ~~N-type & P-type~~ N-type & P-type semiconductors is essential for operations of devices such as transistors and diodes. Semiconductors serve as the foundation for electronic components such as IC's, etc. Therefore, the statement "Semiconductors are brain of modern electronics" is a well-founded & apt observation.

(Section - II) →

(Qno. 6) (a) Series identification:-

(i) 10, 100, 200, 310, ...

The given series is a geometric series where the sum difference of each consecutive term is increasing by 10.

So, the next term would be

430 and onwards.

(ii) 3, 7, 23, 95, _____

The series does not form any immediate series. However, the next term could be 351 if we look at the ratios.

(26) (b) Perimeter of rectangle = $2(L+W)$

Here, $L = 2x + y$, $W = 2x - 3$.

$$114 = 2(2x + y + 2x - 3)$$

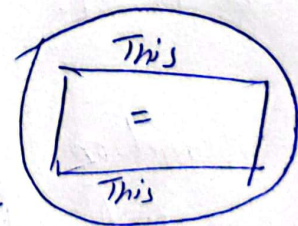
$$114 = 8x + 2y - 6$$

$$8x + 2y = 120$$

$$+ \frac{x - 2y = 0}{\hline}$$

$$9x = 120$$

$$x = \frac{120}{9} = \frac{40}{3}$$



$$\left\{ \begin{array}{l} 3x - y = 2x + y \\ 3x - 2y = y + y \\ x = 2y \\ x - 2y = 0 \end{array} \right.$$

Putting

$$x = \frac{40}{3} \text{ in } x - 2y = 0$$

$$\frac{40}{3} = 2y \Rightarrow y = \frac{40}{6}$$

$$x = \frac{40}{3}, y = \frac{40}{6}$$

$$\text{Area} = L \times W = (2x + y)(2x - 3)$$

$$= 4x^2 - 6x + 2xy - 3y$$

$$= 4\left(\frac{40}{3}\right)^2 - 6\left(\frac{40}{3}\right) + 2\left(\frac{40}{3}\right)\left(\frac{40}{6}\right)$$

$$= 4\left(\frac{1600}{9}\right) - \frac{240}{3} + \frac{80}{3}\left(\frac{40}{3}\right) - 3\left(\frac{40}{6}\right)$$

$$= \frac{6400}{9} - 80 + \frac{1600}{9} - \frac{120}{3}$$

=

C. * Let Nisha's present age = x

Nisha = Romi age + 15

5 years ago \Rightarrow Nisha present - 5 = Romi - 5

Let Romi age = y
Nisha = x

$$x = y + 15$$

$$(x - 5) = 3(y - 5)$$

$$\Rightarrow x - y = 15$$

$$x - 3y = 5$$

$$\begin{array}{r} x - y = 15 \\ - (x - 3y = 5) \\ \hline 2y = 10 \Rightarrow y = 5 \end{array}$$

Therefore, Rumi is 5 years old as
Nisba's present age is 15.