

MODEL QUESTION

Time: 3 hours

Maximum Marks: 80

SECTION-A

1. State the characteristic of gas used in oxygen cylinders supplied to hospitals.
2. Differentiate between milch and draught animals.
3. State Octet rule. State one difference between electron and neutron.
4. Give any two important applications of Archimedes principle.
5. Identify and state the type of transformation of energy in the following cases:
 - (a) When coal is burnt.
 - (b) In a thermal power plant.
6. Between milk, table and air, in which is the force of attraction between the particle maximum? How interparticulate force of attraction affects the rate of diffusion?
7. Three students A, B and C prepared mixtures using chalk powder, common salt and milk respectively in water. Whose mixture:
 - (a) would not leave residue on filter paper after filtration?
 - (b) would show Tyndall effect?
 - (c) would give transparent/clear solution?

OR

Name the appropriate methods to separate the following:

- (a) Dye from blue ink
 - (b) Butter/Cream from milk
 - (c) Ammonium chloride from common salt
8. Write any three differences between a prokaryotic cell and an eukaryotic cell in a tabular form.
 9. What is a disease? Explain the various types of diseases giving one example of each.
 10. Answer the following questions:
 - (a) Give the name of the physical quantity that corresponds to the rate of change of displacement.
 - (b) A man moves on a circular path of radius r and comes to his original position. Find the distance travelled and the displacement of the man.
 - (c) A body is moving with a velocity of 10 m/s. If the motion is uniform, what will be the velocity after 10 s?

11. At what height above the earth's surface would the value of acceleration due to gravity half of what it is on the surface?
12. Briefly mention three uses of ultrasound in the field of medicine.

OR

A sound wave of wavelength 0.332 m has a time period of 10^{-3} s. If the time period is decreased to 10^{-4} s, calculate the wavelength and frequency of new wave.

13. Raj is a farmer residing on the outskirts of Delhi. Upon a visit to a fertilizer shop, the salesman inquired of Raj of the crop he anticipated to cultivate in the coming season. During the conversation, the crop concerned was conveyed. The salesman suggested that urea and other nitrogenous fertilizer be used. Mukesh, quietly but keenly listening the conversation intervened and told Raj that for the concerned crop nitrogenous fertilizers shall not be required. Respond to the following questions using the information provided above:

- (a) What values are shown by Mukesh?
- (b) What can be the concerned crop possibly?
- (c) What can be the reason for Mukesh's suggestion?

14. Write one appropriate word for the statement(s) given below and briefly explain them.

- (a) The process by which carbon is incorporated into life forms.
- (b) The process by which nitrates are converted to free nitrogen.
- (c) The cyclic flow of nutrients like nitrogen & oxygen between non-living environment and living organisms.

15. Mention the two ways of obtaining fish. How farmers are benefitted by fish production and bee keeping?

16. Define the following terms:

- (a) One mole of a species
- (b) Gram atomic mass

Calculate the number of molecules of sulphur (S_8) present in 512 g of solid sulphur.

Given, atomic mass of S = 32 u; Avogadro number (N_0) = 6.022×10^{23} per mol).

17. (a) Bromine has two isotopes $^{79}_{35}\text{Br}$ (49.7%) and $^{81}_{35}\text{Br}$ (50.3%). Calculate the average atomic mass of bromine atom correct to three decimal places.
- (b) Chlorine atom is electrically neutral but chloride is a charged ion. Explain.
18. (a) Draw a neat diagram of transverse section of collenchyma tissue and label any four parts of it.
- (b) Write any two differences between parenchyma and collenchyma tissues.
19. (a) Give any two differences between angiosperms and gymnosperms giving one example of each.
- (b) (i) Draw the relevance of scientific naming of an organisms.
- (ii) Who introduced the system of nomenclature?
- (iii) *Rana tigrina* is the scientific name of common frog. What do these two terms imply?

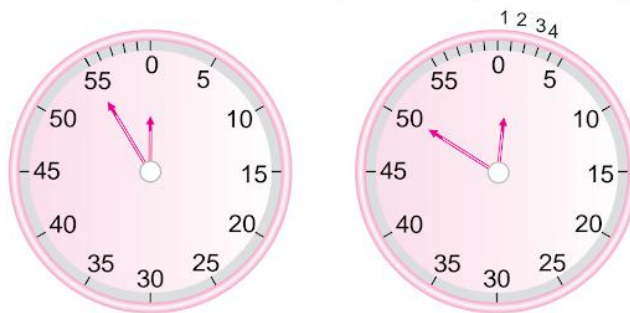
OR

Write four characteristics of Monerans. Blue green algae have been included under the kingdom Monera and not under Plantae. Why?

20. (a) Define momentum. State its SI unit.
 (b) A flower-pot drops from the edge of the roof of a multistoried buildings. Calculate the time taken by the pot to cross a particular distance AB of height 2.9 m, the upper point A being 19.6 m below the roof.
21. (a) State and explain with example the law of conservation of energy.
 (b) A body of mass 1.5 kg is thrown vertically upwards with an initial velocity of 15 m/s. What will be its potential energy at the end of 2 s? (take $g = 10\text{m/s}^2$)

SECTION-B

22. A student prepared three solutions—a solution of alum, soil and milk in water. Can you distinguish between the three on the basis of transparency and stability ? Explain.
23. Sodium carbonate reacts with ethanoic acid to form sodium ethanoate, carbon dioxide and water. In the experiment, 5.3 g of sodium carbonate reacted with 6 g of ethanoic acid to form 8.2 g of sodium ethanoate, 2.2 g of carbon dioxide and 0.9 g of water. Show that this data verifies the law of conservation of mass.
24. Nikita observed a slide of human cheek cells under a microscope in its (a) low magnifying power, (b) high magnifying power settings. What is the difference in the cells in both the cases?
25. Four students A, B, C and D observed the roots and leaves of a maize plant and reported their observations as:
 (a) It has fibrous roots and reticulate venation in leaves.
 (b) It has fibrous roots and parallel venation in leaves.
 (c) It has tap roots and reticulate venation in leaves.
 (d) It has tap roots and parallel venation in leaves.
 Which student had the correct observation? Why?
26. A transverse pulse created at one end of a 5 m long string is observed to complete 6 return journeys along its length before fading out. The initial and final readings on a stop clock used in the experiment are as shown below. Calculate the speed of the pulse through the string in m/s.



27. What are the least counts of the spring balance and the measuring cylinder respectively?

