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SCIENCE
SUPER MOCK 2 | 2 HOURS
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PAPER 2: ESSAY - [100 Marks] *- 1 hour 15 minutes*
Answer Question 1 in Section A and any other three questions in Section B.
SECTION A (COMPULSORY) - [40 Marks]

1. (a) In a physics experiment, a J.H.S. 2 learner places a white cardboard on a bar magnet and sprinkled pieces of iron filings on the cardboard. Fig. 1(a) is an illustration of the resulting pattern observed on the cardboard by the learner in the physics laboratory. Study it carefully and answer the questions that follow.

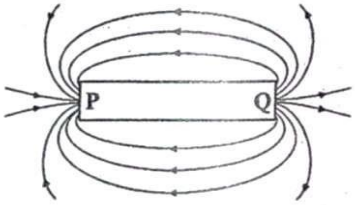
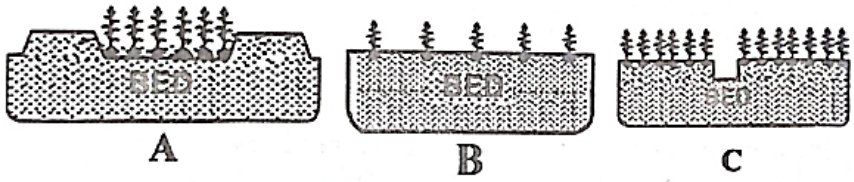


Fig 1 (a)

(i) What name is given to the diagram illustrated in Fig. 1(a) above?
(ii) Identify the parts labelled P and Q.
(iii) State the observations made when the north pole of another magnet is brought towards each of the parts labelled P and Q.
(iv) Give three properties of the bar magnet.
(v) State two applications of magnets in everyday life. [10 marks]

(b) Fig. 1(b)

Study the diagram of the different seed beds illustrated below and answer the questions that follow.



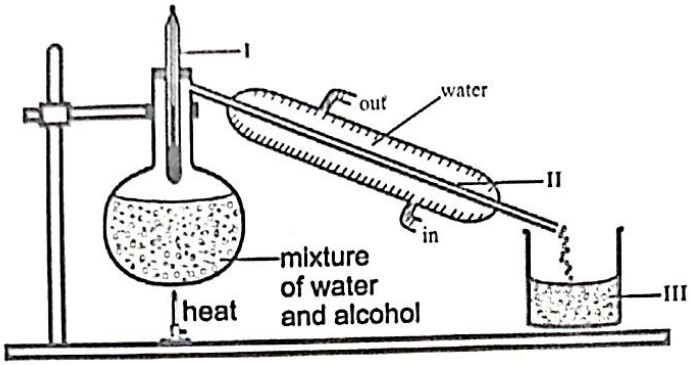
i) Write the names of the seed beds labelled A, B and C.
ii) Name two crops each that are suitable for the various seed beds.
iii) Examine one difference between beds A and C
iv) Outline two conditions each under which the following seed beds are used:
(α) Seed bed A
(β) Seed bed C

(c) During a simple biological experiment, a student mounted a cell under the high powers of a light microscope. He called his biology teacher for confirmation of the type of cell. The teacher, on critically observing the features of the cell, concluded that the cell looked exactly like those of bacteria such as *Escherichia coli* and blue-green algae. ***Answer the questions that follow using the information above.***

(i) Name the type of cell observed by the student.
(ii) Draw a simple and well-labelled diagram of the cell from the observation under the microscope.

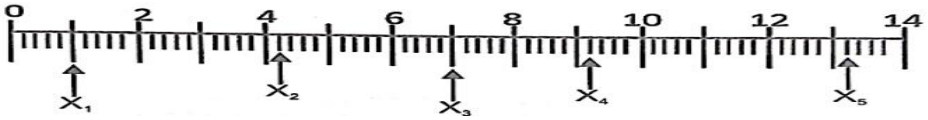
(iii) In what two ways is the cell drawn in (ii) different from that of a human sperm cell?
(iv) Name two observed features in the cell that are also found in a typical plant cell.
(v) Give two safety measures that help to protect against harmful effects of organisms which possess the type of cell drawn. [10 marks]

(d) The diagram below is an illustration of an experimental set up used to separate a mixture of soluble liquids. Study the diagram carefully and answer the questions that follow.



a) Name each of the parts labelled I, II and III .
b) Name the method of separation used in the experiment.
c) State one function of each of the parts labelled I and III.
d) (i) State the boiling point of the Water and alcohol
e) Name three physical processes that are involved in separating the mixture.
f) Describe how vapour from the evaporated liquid is collected back as liquid in the part labelled III.
g) Why was the part labelled I fixed onto the set-up?
h) Why was heat applied to the mixture in the round bottom flask?
i) Which one of the liquids evaporates first and why?

e. The figure below is an illustration of the pH values X_1, X_2, X_3, X_4 and X_5 of five different solutions on a pH scale. The solutions are vinegar, salt solution, solution of plant ash, dilute nitric acid and ammonia solution.
Study the illustrations carefully and answer the questions that follow.



a) Read and record each of the pH values X_1, X_2, X_3, X_4 and X_5
b) Pair each of the pH values with the appropriate liquids.

Tabulate your data as shown.

pH	X_1	X_2	X_3	X_4	X_5
solution					

c) Give one reason for each pair of pH values and solutions.
d) Distinguish between strong acid and weak acid.