

CLASS

8

QUESTION PAPER SET

C



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Name:

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Total Questions: 50

Time: 1 hr.


myclassroom
PRESENTS



**SOF NATIONAL SCIENCE
OLYMPIAD 2022-23**

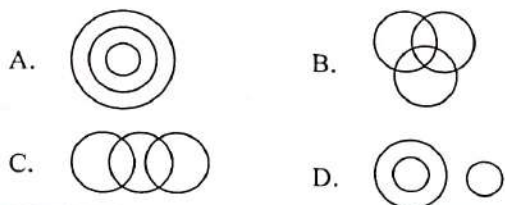
Guidelines for the Candidate

1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Roll No.** and **Mobile Number** clearly on the **OMR Sheet** and do not forget to sign it. We will share your marks / result and other information related to SOF exams on your mobile number.
3. The Question Paper comprises three sections:
Logical Reasoning (10 Questions), **Science** (35 Questions) and **Achievers Section** (5 Questions)
Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.
4. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
5. There is only **ONE** correct answer. Choose only **ONE** option for an answer.
6. To mark your choice of answers by darkening the circles on the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only. E.g.
Q.16: In the water cycle, condensation is the process of
A. Water vapour cooling down and turning into a liquid
B. Ice warming up and turning into a liquid
C. Liquid cooling down and turning into ice
D. Liquid warming up and turning into water vapour
As the correct answer is option A, you must darken the circle corresponding to option A on the OMR Sheet.
7. Rough work should be done in the blank space provided in the booklet.
8. Return the OMR Sheet to the invigilator at the end of the exam.
9. Please fill in your personal details in the space provided on this page before attempting the paper.

16. ● (B) (C) (D)

LOGICAL REASONING

1. Which of the following Venn diagrams best depicts the relationship amongst, "Taxi drivers, Males and Urban people"?



2. If '+' means '-', '×' means '+', '-' means '+' and '÷' means '×', then find the value of $48 + 6 \times 4 \div 3 - 2$.

- A. 54
B. -54
C. 2
D. -2

3. In a certain code language, VERTICAL is coded as USFWKZBH. How will MOVEMENT be coded in the same code language?

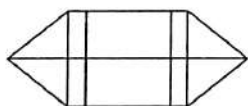
- A. OMEVEMTN
B. OQXGOGPV
C. FWPNSMDL
D. UOFNFWPN

4. One term in the given number series is wrong. Find out the wrong term.

4, 4, 8, 24, 96, 288, 2880

- A. 96
B. 8
C. 24
D. 288

5. Find the total number of rectangles formed in the given figure.

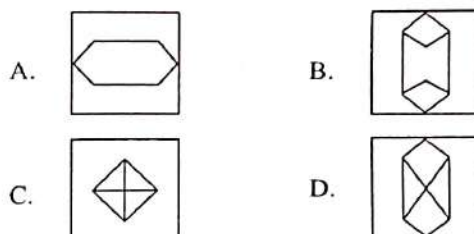


- A. 10
B. 9
C. 12
D. More than 12

6. Pointing to a photograph, Meera said, "He is the son of the only son of my grandfather." How is the man in the photograph related to Meera?

- A. Brother
B. Uncle
C. Cousin
D. None of these

7. Select a figure from the options in which the given figure is exactly embedded as one of its parts.

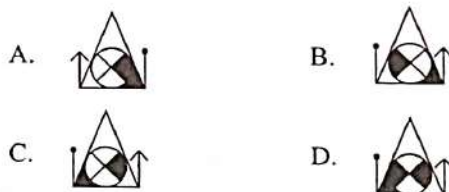


8. Which of the following words will come in the second place, if all the given words are arranged as in a dictionary?

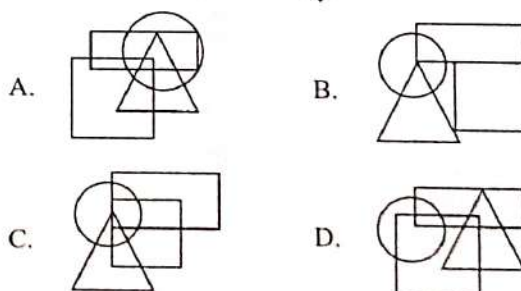
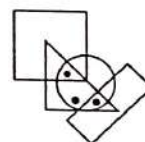
Saturday, Sacrifice, Saturation, Sarcastic

- A. Sarcastic
B. Saturday
C. Saturation
D. Sacrifice

9. Select the correct mirror image of the given figure.



10. Select a figure from the options which satisfies the same conditions of placement of the dots as in the given figure.



SCIENCE

11. Match column I with column II and select the correct option from the given codes.

Column I	Column II
P. Floatation	(i) Pascal
Q. Atmospheric pressure	(ii) Manometer
R. Pressure	(iii) Buoyant force
S. Liquid pressure	(iv) Barometer
A. P - (i), Q - (iii), R - (ii), S - (iv)	
B. P - (ii), Q - (iv), R - (i), S - (iii)	
C. P - (iii), Q - (iv), R - (i), S - (ii)	
D. P - (iv), Q - (ii), R - (i), S - (iii)	

12. Read the following statements about electroplating.

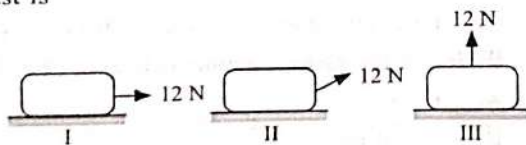
- I. Electroplating protects objects from magnetism.
- II. Electroplating makes objects look more attractive and protects them from corrosion and rusting.
- III. Electroplating is the coating of metal objects with a thin layer of a different metal.

Which one of the given statements is/are correct?

- A. I only
 - B. II only
 - C. II and III only
 - D. III only
13. Fill in the blanks and select the most appropriate option.
- The loudness of sound depends on the (i) of vibration of the source producing the sound. Loudness is proportional to (ii) of the (i) of sound. It is measured in (iii).

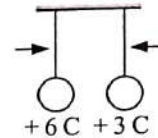
	(i)	(ii)	(iii)
A.	Frequency	Square	Hertz
B.	Frequency	Square root	Decibel
C.	Amplitude	Square	Hertz
D.	Amplitude	Square	Decibel

14. A block rests on a horizontal surface and a boy pulls it with a 12 N force (as shown in the given figure). No matter what is the orientation of the force, the block does not move. The magnitude of the frictional force exerted by the surface on the block from greatest to least is

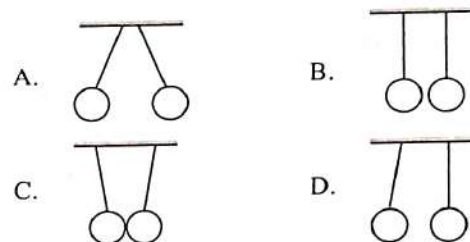


- A. II, I, III
- B. I, II, III
- C. II, III, I
- D. I, III, II

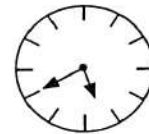
15. Two identical light conducting balls having different charges are being suspended freely. They are pushed towards each other as shown in the given figure.



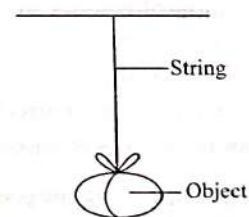
Which of the following options shows the correct position of the two balls, just after they touch each other?



16. A boy was looking at a plane mirror on a wall in which he saw the image of a clock hung behind him as shown in the given figure. What was the time in the clock?

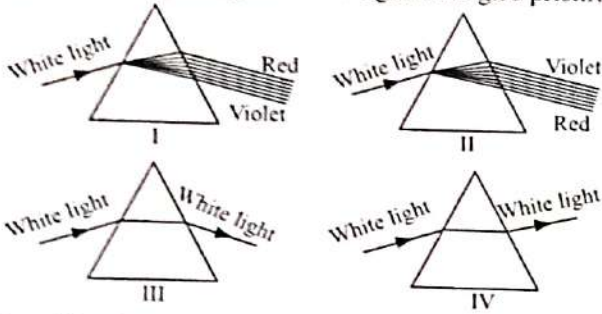


- A. 12 : 10
 - B. 11 : 50
 - C. 5 : 40
 - D. 6 : 20
17. The given diagram shows an object hanging from a string. Which of the following is the correct statement about the given situation?



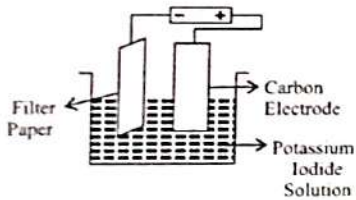
- A. The object does not fall because there is no gravity.
- B. The object does not fall because there is friction between the object and the string.
- C. The object does not fall because a magnetic force is acting on it.
- D. The object does not fall because the string is exerting a force against the earth's gravity.

18. Which of the following given figures correctly represents the passage of white light through a prism?



- A. II only
B. III only
C. I only
D. I and II only

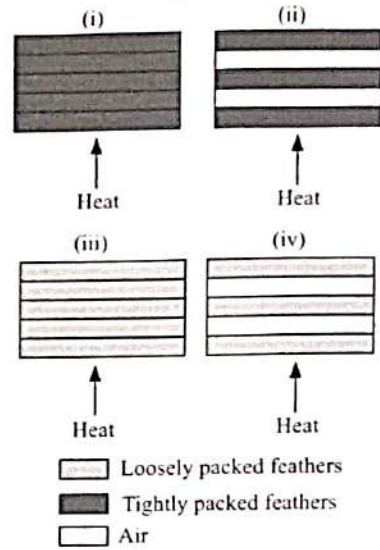
19. The whispering sound of a person can be heard by everyone, if he/she
- A. Increases the amplitude of the sound
B. Increases the frequency of the sound
C. Increases the velocity of the sound
D. Decreases the velocity of the sound.
20. The filter paper containing starch is soaked in potassium iodide solution and connected to the battery, as shown in the given figure. The filter paper turns blue-black in colour.



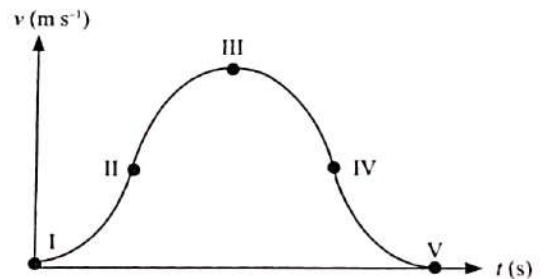
Now, consider the following statements and select the correct option.

- (i) Iodine is formed at the anode.
(ii) Iodine turns blue-black in the presence of starch.
- A. Only (i) is correct.
B. Only (ii) is correct.
C. Both (i) and (ii) are correct.
D. Neither (i) nor (ii) is correct.
21. A simple pendulum oscillates between points P and R . If the time period of oscillations of the pendulum is 3.6 seconds, then what is the time the bob takes to move from Q to P ?
-
- A. 1.8 seconds
B. 0.9 second
C. 2.7 seconds
D. 3.0 seconds

22. Which of the following arrangements best minimizes the rate of thermal energy transfer?



- A. (i) only
B. (i) and (ii) only
C. (ii) only
D. (iii) and (iv) only
23. The velocity-time graph of a moving object is shown below.



At point III the object, is moving with

- A. Increasing acceleration
B. Increasing velocity
C. Decreasing acceleration
D. No acceleration.
24. Consider the following statements about electromagnets.
- I. Electromagnets work on the principle of magnetic effects of electric current.
II. Electromagnets are used in electric bell.
III. Electromagnets are used to lift heavy loads.
- Which of the given statements is/are correct?
- A. I only
B. II and III only
C. I and III only
D. I, II and III

25. Read the given statements and select the correct option.

Statement 1 : In a cyclone, the wind tends to blow towards the low pressure region and circulates violently around the centre of cyclone with great speed.

Statement 2 : The cyclone consists of a high pressure region with low pressure all around.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true but statement 2 is false.
 D. Statement 1 is false but statement 2 is true.

26. Read the given statements and select the correct option.

Statement 1 : Kerosene oil and wood do not catch fire on their own at room temperature.

Statement 2 : A combustible material cannot catch fire as long as the temperature is lower than its ignition temperature.

- A. Both statement 1 and statement 2 are true and statement 2 is the correct explanation of statement 1.
 B. Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true but statement 2 is false.
 D. Both statement 1 and statement 2 are false.

27. Read the given passage and fill in the blanks by selecting an appropriate option.

(i) is a fossil fuel. It occurs deep below the ground in certain areas of the earth. Another fossil fuel (ii) is found trapped above the deposits of (i). When (i) is subjected to (iii), then a number of different products are collected at different temperature ranges. A special grade of product (iv) is used as aviation fuel in jet aeroplanes.

- | | (i) | (ii) | (iii) | (iv) |
|----|-----------|-------------|--------------------------|----------|
| A. | Coal | Coal gas | Destructive distillation | Coal tar |
| B. | Coke | Petroleum | Fractional distillation | Petrol |
| C. | Petroleum | Natural gas | Fractional distillation | Kerosene |
| D. | Petroleum | Natural gas | Fractional distillation | Diesel |

28. Read the following statements and select the option that correctly identifies them as true (T) and false (F) ones.

- I. A physical change is generally irreversible.
 II. Galvanisation prevents the rusting of iron by coating the surface of iron with a layer of zinc.
 III. Crystallisation is an example of a chemical change.

- | | I | II | III |
|----|---|----|-----|
| A. | F | F | T |
| B. | T | F | F |
| C. | F | T | F |
| D. | T | T | F |

29. The nature of a few common substances are summarised in the given table.

S.No.	Material	Combustible/Non-combustible
1.	Petrol	Non-combustible
2.	Charcoal	Combustible
3.	Wood	Non-combustible
4.	Stone	Combustible
5.	Magnesium ribbon	Combustible
6.	Glass	Non-combustible

The incorrect classifications are

- A. 1, 4 and 6 only B. 1, 3 and 4 only
 C. 2, 5 and 6 only D. 2, 4 and 5 only
30. Match column I with column II and select the correct option from the given codes.

- | Column I | Column II |
|----------------|-----------------------------------|
| P. Petrol | (i) Fuel for heavy motor vehicles |
| Q. Coal tar | (ii) Cleaner fuel |
| R. Diesel | (iii) Perfumes |
| S. Natural gas | (iv) Solvent for dry cleaning |
- A. P-(iii), Q-(i), R-(iv), S-(ii)
 B. P-(iv), Q-(iii), R-(i), S-(ii)
 C. P-(iv), Q-(iii), R-(ii), S-(i)
 D. P-(iii), Q-(iv), R-(i), S-(ii)

31. Select the incorrect statements among the following.

- I. Higher the calorific value of a fuel, lower is its efficiency.
 II. Increased concentration of carbon monoxide in the air causes global warming.
 III. The substances which vapourise during burning, produce flames.
 IV. Ignition of crackers to evolve heat, light and sound represents rapid combustion.
- A. I and II only B. II and III only
 C. I, II and IV only D. II and IV only

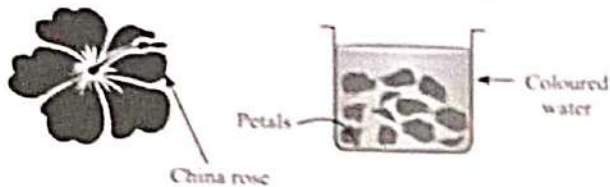
32. A few substances are listed in the given box.

(i) Orange juice	(ii) Shampoo
(iii) Aerated soft drink	(iv) Sugar solution
(v) Calamine solution	(vi) Lime water

Which of the following represents the correct classification of these substances?

	Acidic	Basic	Neutral
A.	(ii), (iv)	(i), (iii), (v)	(vi)
B.	(i), (iii)	(ii), (v)	(iv), (vi)
C.	(i), (ii)	(iii), (v), (vi)	(iv)
D.	(i), (iii)	(ii), (v), (vi)	(iv)

33. Neetu took some warm water in a beaker and put some China rose petals in it. She kept the petals dipped for some time till the water becomes coloured.



She took few drops of this solution and put them in solutions X and Y. X and Y changed the colour of China rose solution to magenta and green respectively. What could be X and Y?

	X	Y
A.	Vinegar	Sugar solution
B.	Lime water	Lemon juice
C.	Calamine solution	Washing soda
D.	Curd	Window cleaner

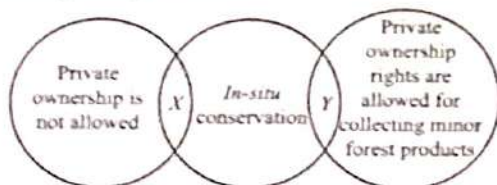
34. Study the given correlation.

Heat treatment : Sterilisation :: Vaccination : X

Here, X refers to

A. Pasteurisation	B. Immunisation
C. Fertilisation	D. Inoculation

35. Refer to the given Venn diagram and select the correct option regarding X and Y.



	X	Y
A.	Biosphere reserve	Botanical garden
B.	Wildlife sanctuary	National park
C.	Botanical garden	Zoological park
D.	National park	Wildlife sanctuary

36. Which among the following organisms is known as baker's yeast?

- A. *Lactobacillus*
- B. *Saccharomyces cerevisiae*
- C. *Aspergillus*
- D. *Streptomyces*

37. Read the following statements and select the correct ones.

- (i) Regeneration is a form of sexual reproduction in which parent body breaks into distinct pieces to produce an offspring.
- (ii) *Rhizopus* reproduces by spore formation.
- (iii) Oviduct is the organ where zygote matures and grows till it is ready to be born.
- (iv) Cloning is the process of producing genetically identical copy of an organism.

- A. (i) and (iv) only
- B. (ii) and (iv) only
- C. (i) and (iii) only
- D. (ii) and (iii) only

38. Match the columns and select the correct option from the codes given below.

Column I (Organism)	Column II (Feeding method)
(i) Butterfly	P. Gnawing
(ii) Rabbit	Q. Sucking
(iii) Sponges	R. Filter feeding
A. (i)-R, (ii)-Q, (iii)-P	
B. (i)-Q, (ii)-P, (iii)-R	
C. (i)-R, (ii)-P, (iii)-Q	
D. (i)-Q, (ii)-R, (iii)-P	

39. Pick the odd one out from each series given below and select the correct option.

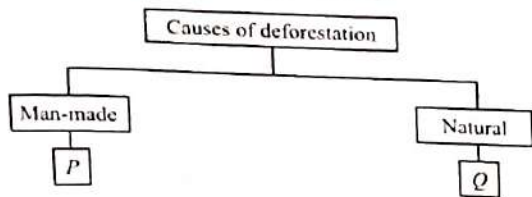
- (i) Moat, Dhekli, Sprinkler system, Rahat
- (ii) Urea, Disyston, Potash, Ammonium sulphate
- (iii) *Khurpi*, Weedicides, Harrow, Silos
- (iv) Sowing, Irrigation, Hybridisation, Harvesting
- (v) 2, 4-D, MCPA, Butachlor, BHC

	(i)	(ii)	(iii)	(iv)	(v)
A.	Dhekli	Urea	<i>Khurpi</i>	Irrigation	Butachlor
B.	Sprinkler system	Disyston	Silos	Hybridisation	BHC
C.	Moat	Potash	Harrow	Sowing	MCPA
D.	Rahat	Urea	Silos	Harvesting	Butachlor

40. _____ is a single cell protein.

- A. *Amaranthus*
- B. *Parthenium*
- C. *Spirulina*
- D. *Eichhornia*

41. Refer to the given classification chart and select the correct option regarding P and Q .



- | P | | Q | |
|---------------------------------------|--|--|--|
| A. Flood | | Cleaning land for mining | |
| B. Cutting trees for making furniture | | Volcanic eruption | |
| C. Forest fire | | Cutting trees for procuring land for cultivation | |
| D. Volcanic eruption | | Pathogenic diseases of plants | |

42. Which among the following statements is/are incorrect regarding characteristics of wind pollinated flowers?

- (i) The flowers are small, dull and colourless.
 (ii) They have sticky stigma and sticky pollen grains.
 (iii) They produce small and light pollens.
 (iv) The stigma is long, feathery and exposed.
- A. (i) and (iv) only B. (iii) only
 C. (ii) only D. (ii) and (iv) only

43. Fill in the blanks and select the correct option.

- (i) _____ are the part of phloem through which food is transported.

- (ii) _____ is the rhythmic contraction and relaxation of heart.

- (iii) _____ are smallest blood vessels that connect arteries to veins.

- | | (i) | (ii) | (iii) |
|----|-------------|-----------|-------------|
| A. | Sieve tubes | Heartbeat | Capillaries |
| B. | Tracheids | Pulse | Arteries |
| C. | Guard cells | Pulse | Capillaries |
| D. | Vessels | Pulse | Capillaries |

44. Which of the following is the correct sequence of inspiration?

- A. Nasal cavity → Pharynx → Trachea → Larynx → Bronchi → Bronchioles → Alveoli
 B. Nasal cavity → Pharynx → Larynx → Trachea → Bronchioles → Bronchi → Alveoli
 C. Nasal cavity → Pharynx → Larynx → Trachea → Bronchi → Bronchioles → Alveoli
 D. Nasal cavity → Larynx → Pharynx → Trachea → Bronchi → Bronchioles → Alveoli

45. X is the strongest natural fibre and is chiefly made up of protein Y .

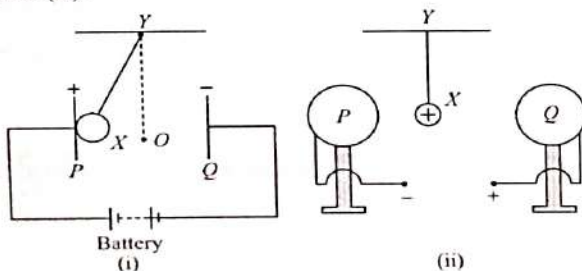
Select the correct option for X and Y .

- | | X | Y |
|----|-----------|---------|
| A. | Mohair | Fibroin |
| B. | Cotton | Sericin |
| C. | Shahtoosh | Sericin |
| D. | Silk | Fibroin |

ACHIEVERS SECTION

Direction (Q. No. 46 and 47) : Refer to the given paragraph and answer the questions.

A light spherical conductor X is suspended by an insulating thread from a fixed point Y . Initially X is neutral and it is placed between two parallel plates P and Q as shown in the given figure (i). Now X is kept grounded for a long time, then it is given a positive charge and suspended between two insulated metal spheres P and Q , which are connected to a battery as shown in the given figure (ii).



46. In the given figure (i), point Y is vertically above midpoint O of the line joining the centre of the plates.

Now, if the sphere is initially placed in contact with P as shown, which of the following best describes its subsequent motion?

- A. It remains in contact with plate P .
 B. It moves to plate P and sticks to it.
 C. It moves back and forth continuously, touching each plate intum.
 D. It moves to point O and quickly comes to rest there.

47. In the given figure (ii) when the switch is closed, the sphere X will

- A. Move to Q and stays there
 B. Move to P and stays there
 C. Move to Q and then oscillates between P and Q
 D. Move to P and then oscillates between P and Q .

48. Read the given statements and select the option that correctly identifies them as true (T) and false (F) ones.

- (i) Project Tiger was launched by Government of India in 1975 to conserve tiger in its natural environment.
- (ii) Asiatic lion is endemic to Sundarbans whereas Royal Bengal tigers are endemic to Gir National Park.
- (iii) Nilgiri langur is listed as vulnerable species in IUCN red list.
- (iv) Illegal hunting of animals is called poaching.

	(i)	(ii)	(iii)	(iv)
A.	F	F	T	T
B.	T	F	T	F
C.	F	F	F	T
D.	T	T	T	F

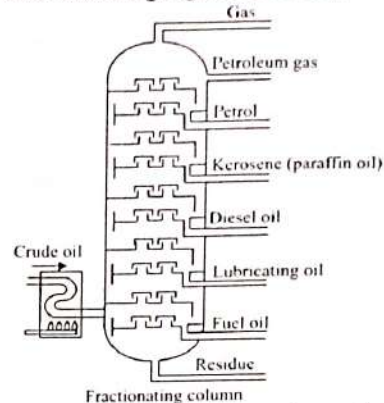
49. Read the given paragraph where few words have been italicized and select the correct statement regarding them.

Manures are *inorganic* substances obtained from dead plants and animal wastes. *Green* manure is a mixture of decomposed cattle dung, left over fodder and litter whereas *farmyard* manure consists of green plants which are ploughed into the soil. Manures *restore* the soil texture and *decrease* the water holding capacity of the soil.

- A. *Inorganic* should not be replaced as it is correctly mentioned.

- B. *Green* and *farmyard* should not be changed as they are correctly mentioned.
- C. *Decrease* should be replaced with *increase*.
- D. Both A and B

50. Study the following figure carefully.



Select the incorrect statements from the following.

- I. The process of separating various constituents or fractions of petroleum is called destructive distillation.
 - II. Kerosene is used as a fuel for car engines.
 - III. Bitumen is used for paving road surfaces.
 - IV. The liquid with the lowest boiling point condenses first near the top of the fractionating column.
- A. III and IV only B. I and II only
C. I and III only D. II and IV only

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