

8159

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SCIENCE (Theory) — Paper I
(Physics and Chemistry)

Time Allowed : $2\frac{1}{2}$ Hours]

[Maximum Marks : 100

Instruction : Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

(PHYSICS)

(Marks : 50)

SECTION - A

Answer all the questions.

I. Choose the correct answers :

 $10 \times 1 = 10$

1. 1000 watt is equal to

- | | |
|------------|--------------------------|
| a) 746 HP | b) 74600 HP |
| c) 1.34 HP | d) 3.6×10^3 HP. |

2. A cone balanced on its tip is an example for

- | | |
|------------------------|-------------------------|
| a) stable equilibrium | b) unstable equilibrium |
| c) neutral equilibrium | d) none of these. |

3. The centre of gravity of the displaced liquid is called

- | | |
|----------------------|-----------------------|
| a) centre of gravity | b) centre of buoyancy |
| c) centroid | d) metacentre. |

4. The S.I. unit for heat is

- | | |
|----------|-------|
| a) joule | b) °C |
| c) °F | d) K. |

[Turn over

5. The fixed temperature at which a liquid changes into vapour is called
- | | |
|------------------|------------------|
| a) melting point | b) boiling point |
| c) evaporation | d) condensation. |
6. Presbiopia can be corrected using
- | | |
|-----------------|----------------------|
| a) convex lens | b) concave lens |
| c) bifocal lens | d) cylindrical lens. |
7. The dip at the equator is
- | | |
|---------------|-----------------|
| a) 0° | b) 45° |
| c) 60° | d) 90° . |
8. The pipe instrument without reed is
- | | |
|-------------|---------------|
| a) clarinet | b) trumpet |
| c) organ | d) harmonium. |
9. Fleming's Right Hand Rule is used in
- | | |
|----------------|----------------|
| a) motor | b) dynamo |
| c) transformer | d) microphone. |
10. The radiations not deflected by electrical and magnetic fields are
- | | |
|-----------------|--------------|
| a) alpha rays | b) beta rays |
| c) cathode rays | d) X-rays. |
- II. Complete the following using appropriate word / words / expressions : $5 \times 1 = 5$
11. The mathematical expression for Joule's Law of Heating
 12. In Tamil Nadu the nuclear power plant is situated in
 13. The unit for frequency is
 14. The critical angle for glass is
 15. The change from the solid state to the gaseous state directly on heating is called

SECTION - B

Answer any *five* of the following in *one* or *two* sentences each :

5 × 2 = 10

16. State the law of conservation of energy.
17. Define metacentre.
18. Compare open organ pipe and closed organ pipe.
19. Mention the element of earth's magnetic field.

Give the reasons for the following :

20. A fuse is used in electrical appliances.
21. Water should be continuously circulated around the anode of an X-ray tube.

Give *two* uses or practical applications of the following :

22. IR rays.
23. Specific heat.

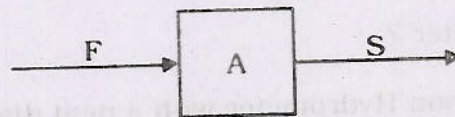
SECTION - C

Answer any *five* of the following, choosing at least *one* question from each Part :

5 × 5 = 25

PART - I

24.



In the diagram F is the force acting on a body A and S is the displacement.

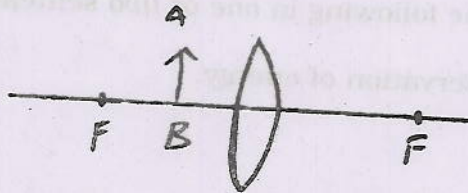
- a) What is the work done ? 1
- b) Give the S.I. unit of work. 1
- c) If the body does not move, what is the work done ? 1
- d) If the mass of the body is 10 kg, and the distance moved by it is 20 ms, calculate the work done. 2

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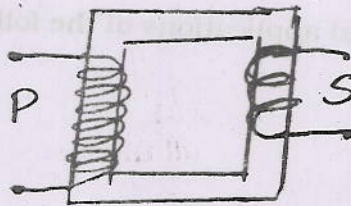
25.



- a) Name the optical instrument.
- b) What is the nature of the image ?
- c) Complete the ray diagram.
- d) Mention any one of its uses.

1
1
2
1

26.



- a) Name the device. Why is it called so ?
- b) Name the principle on which it works.
- c) Mention one of its uses.
- d) What is turns ratio ?

1 + 1
1
1
1

PART - II

- 27. a) What is a Lactometer ?
- b) Describe the common Hydrometer with a neat diagram.
- c) Mention any one use of Hydrometer.
- 28. Describe an experiment to determine the melting point of naphthalene.
- 29. State the laws of transverse vibrations of a stretched string and hence derive an equation for frequency.
- 30. Describe the construction and working of a dip circle.
- 31. Describe the Coolidge tube and the production of X-rays.

1
2 + 1
1

(CHEMISTRY)

(Marks : 50)

SECTION - A

Answer all the questions.

- I. Choose the correct answers : 10 × 1 = 10
- The ratio by weight of hydrogen and oxygen in water is
 - 1 : 8
 - 8 : 1
 - 2 : 1
 - 1 : 2.
 - The molar volume is litres.
 - 2.24
 - 22.4
 - 224
 - none of these.
 - is an electrovalent compound.
 - HCl
 - NaCl
 - NH₃
 - CH₄.
 - can be stopped by a thick sheet of lead.
 - Alpha
 - Beta
 - Gamma
 - All of these.
 - is used in dating ancient specimens.
 - Na²³
 - Na²⁴
 - C¹²
 - C¹⁴.
 - Tyndall effect is exhibited by
 - true solution
 - colloidal solution
 - suspension
 - all of these.

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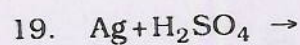
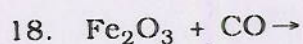
7. is the most stable form of phosphorus.
- a) Scarlet b) Violet
- c) White d) Red.
8. is used to neutralize acidity in the stomach.
- a) Sodium hydroxide b) Sodium chloride
- c) Sodium carbonate d) Sodium bicarbonate.
9. The functional group R-OH is
- a) acid b) alcohol
- c) ether d) ester.
10. does not decolourise alkaline potassium permanganate.
- a) Methane b) Ethene
- c) Ethyne d) None of these.
- II. Complete the following, using appropriate word/words/expressions : $5 \times 1 = 5$
11. is a liquid non-metal.
12. The promoter used in the contact tower is
13. Gain of electrons is
14. Detergents are salts of
15. Carbon combining with itself to form long chains is called

SECTION - B

Answer any *five* questions in *one* or *two* sentences each : $5 \times 2 = 10$

16. What is radioactivity ?
17. What are metalloids ?

Complete and balance :



Give reasons :

20. White phosphorus is banned in the match industry.

21. Methanol is more poisonous than ethanol.

Give two practical applications :

22. Aluminium.

23. Ethylene.

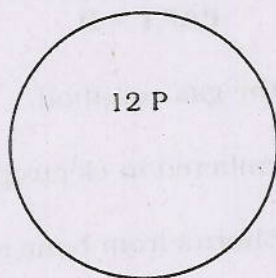
SECTION - C

Answer any five of the following, choosing at least one question from each Part :

5 × 5 = 25

PART - I

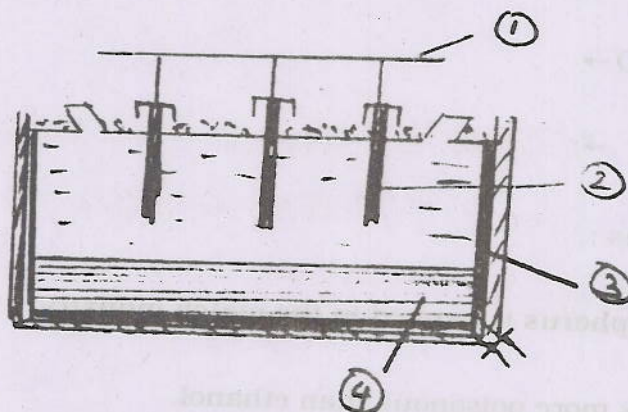
24. Study the following diagram and answer :



- | | |
|--------------------------------|---|
| a) What is the atomic number ? | 1 |
| b) What is the mass number ? | 1 |
| c) Name the element. | 1 |
| d) Complete the structure. | 2 |

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25.



- a) Label the parts. 2
- b) Why is charcoal added ? 1
- c) Write the Electrode reactions. 2
26. You are provided with a conical flask, delivery tubes, thistle funnel, trough gas jar and beehive shelf :
- a) How will you set up the apparatus for the preparation of acetylene ? 3
- b) Why is sand added ? 1
- c) Mention one of its uses. 1

PART - II

27. State the gas laws and derive the gas equation. 3 + 2
28. What are the points to be remembered in electroplating ?
29. Explain the extraction of phosphorus from bone ash.
30. Give any five differences between organic and inorganic compounds.
31. Explain the manufacture of soap by hot process.