Physical Sciences

Time : $2\frac{1}{2}$ Hours]	**PARTS – A & B**	[Max. Marks : 50

Instructions :

1. Answer the questions under **Part 'A'** on a separate answer book.
2. Write the answers to the questions under **Part 'B'** on the question paper itself and attach it to the answer book of **Part (A)**.

Time : 2 Hours]	PART – A	. [Marks : 35

SECTION – I (Marks : 5 × 2 = 10)

Note : 1) Answer *ANY FIVE* questions, choosing atleast *TWO* from each *GROUP*.
  2) Each question carries *TWO* marks.

Group – A

1. Explain the working of a Laundry drier.
2. Calculate the magnetic moment of a short bar magnet of length 5 cm. and pole strength 2×10^{-3} A – n
3. Draw the symbols of p – n – p transistor and n – p – n transistor.
4. What are Hardware and Software of a Computer ?

Group – B

5. Write the electronic configuration of (i) Copper (ii) Magnesium.
6. Draw the shapes of (i) H_2O (ii) PCl_3.
7. 2 moles of Sodium carbonate is dissolved in 3 moles of water. Calculate the mole fraction c Sodium carbonate and water.
8. Define and give two examples for each
   (i) Cosmetic and (ii) Pharmaceuticals.

SECTION – II (Marks : 4 × 1 = 4)

Note : 1) Answer *ANY FOUR* of the following *SIX* questions.
  2) Each question carries *ONE* mark.

9. What is Heliocentric theory ?
10. What is meant by Resonance ?
11. What are Isotones ?
12. Write the Planck's equation.
13. Define pH.
14. What is the use of Micro - fertilizers ?

SECTION – III (Marks : 4 × 4 = 16)

Note : 1) Answer *ANY FOUR* questions, choosing atleast *TWO* from each *GROUP*.
  2) Each question carries *FOUR* marks.

Group – A

15. Give a comparison between Newton's Corpuscular theory and Wave theory of light.

16. State Ohm's Law. Describe an experiment to verify Ohm's law.

17. What is the principle of a Nuclear Reactor ? How is a chain reaction controlled in a nuclear reactor?

18. State the properties and uses of a Junction Diode.

Group – B

19. Write the important features of Rutherford's planetary model and its defects.

20. Explain the formation of Co-ordinate Covalent bond with an example.

21. Answer the following questions.
   a) Define Ionisation Energy.
   b) What is Newland's concept of octaves ?
   c) What are inner transition elements ?
   d) What are transition elements ?

22. How do you test the quality of soap ?

SECTION – IV (Marks : 1 × 5 = 5)

Note : 1) *Answer ANY ONE of the following questions.*
      2) *This question carries FIVE marks.*

23. Draw a neat diagram of Screw Gauge showing various parts.

24. Draw the chart showing the manufacture of Alcohol and label its various parts.

Time : 30 Minutes]   PART – B   [Marks : 15

Note :

1) *Answer all questions.*

2) *Each question carries $\frac{1}{2}$ mark.*

3) *Candidates must use the CAPITAL LETTERS while answering the multiple choice questions.*

4) *Marks will not be awarded in case of any overwriting or re-writing or erased answers.*

I. *Write the letter of the correct answer in the brackets provided against each question.*

1. The law of Gravitation   (   )
   A) applies only to large bodies such as planets and stars.
   B) accounts for all known forces.
   C) holds only in the Solar system.
   D) holds every where in the Universe.

2. Maximum height reached by a body when it is projected upwards with a velocity u is
   A) $\frac{u}{g}$ B) $\frac{u^2}{2g}$ C) $\frac{2u}{g}$ D) $\frac{u}{2g}$ (   )

3. The wave-length range of visible spectrum is   (   )
   A) 0.4 μ.m. – 0.7 μ.m.
   B) 0.7 μ.m. – 100 μ.m.
   C) 0.001 n.m. – 10 n.m.
   D) 1 m. – 100 km.

4. Laser is used in treatment of diseases of
   A) Heart   B) Bone fracture (   )
   C) Lung   D) Brain

5. An example for Diamagnetic substance is   (   )
   A) Bi   B) O_2 C) Fe   D) Ni

6. Among 3p, 4s, 3d and 4p, the orbital having the least energy is   (   )
   A) 4s   B) 3p   C) 3d   D) 4p

7. 10 gms. of Na_2CO_3 is dissolved in 190 grams of water. The weight percentage of solution is   (   )
   A) 20   B) 10   C) 2.5   D) 5

8. Which of the following is not a by-product of Sugar Industry ?   (   )
   A) Bagasse   B) Sugar
   C) Press mud   D) Molasses

9. Bond length of Graphite is in Å units ( )

A) 2.45   B) 4.21   C) 1.42   D) 2.81

10. Drugs which act on blood circulation are ( )

A) cardio-vascular   B) antibodies
C) vitamins   D) hormones

II. *Fill in the blanks :*

11. When a body is projected towards Earth, the acceleration due to gravity is taken as ....

12. RADAR means ....

13. Particles undergo maximum displacement at .... in a Stationary waves.

14. The susceptibility (χ) of diamagnetic substances is ....

15. The equivalent resistance of two resistors 6Ω, 12Ω when connected in series is ....

16. .... metal gives peroxide in addition to oxide when burnt in excess of Oxygen.

17. The colour of methyl orange indicator in acidic medium is ....

18. Alkenes undergo .... reactions.

19. Glass blowing is possible with ....

20. Chief component of cooking gas is ....

III. *Match the following :*

Group 'A'	PHYSICS		Group 'B'
21. α - particle	[ ]	A)	Aluminium
22. β - particle	[ ]	B)	Positive charge
23. Radioactivity	[ ]	C)	No. of Protons + No. of Neutrons
24. Atomic Mass Number	[ ]	D)	Uranium
25. Atomic Number	[ ]	E)	Electrically neutral
		F)	No. of Protons
		G)	Negative charge

Group 'A'	CHEMISTRY		Group 'B'
26. Ethane	[ ]	A)	C_2H_2
27. Pentane	[ ]	B)	C_6H_{14}
28. Hexane	[ ]	C)	C_5H_{10}
29. Pentene	[ ]	D)	C_5H_{12}
30. Acetylene	[ ]	E)	C_4H_{10}
		F)	C_5H_8
		G)	C_2H_6

PART – B : ANSWERS

I.   1) D   2) B   3) A   4) C   5) A   6) B   7) D   8) B   9) C   10) A

II.   11) positive   12) Radio Detection and Ranging   13) Antinode

14) very low and negative   15) 18Ω or 18 Ohms   16) Barium (Ba)

17) Red   18) addition   19) Pirex glass or Borosilicate   20) Butane or C_4H_{10}

III.   21) B   22) G   23) D   24) C   25) F   26) G   27) D   28) B   29) C   30) A

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