Physical Sciences

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 at least **TWO** from each **Group.**

2. Each question carries **TWO** marks.

Group - A

1. What is Centrifuge ? How does it work ?
   (Unit - 4)

2. State Inverse square Law of Magnetism.
   (Unit - 8.2)

3. What are Isobars ? Give an example.
   (Unit - 10.3)

4. What is Doping ?   *(Unit - 11.2)*

Group - B

5. What is the shape of Ammonia molecule Draw it.   *(Unit - 2)*

6. Calculate the number of moles of NaOH present in 750 ml of 0.4 M solution. (Molecular weight of NaOH is 40)   *(Unit - 5)*

7. What is Polymerization ?   *(Unit - 7)*

8. What are the advantages of hydrogenation of oil ?   *(Unit - 9)*

SECTION - II (Marks : 4 × 1 = 4)

Note : 1. Answer **ANY FOUR** questions from the following.

2. Each question carries **ONE** mark.

9. State Hooke's law.   *(Unit - 2)*

10. In a resonating air column experiment with a closed-end tube, first resonance occurs when the length of the air column is 10 cm. Find out the length of the air column for the occurrence of second resonance.   *(Unit - 6)*

11. Define the term "Mass defect" ?   *(Unit - 10.2)*

12. Write the electronic configuration of Chromium.   *(Unit - 1)*

13. What is ionic product of water ?   *(Unit - 6)*

14. What are Adhesives ?   *(Unit - 10)*

SECTION - III (Marks : 4 × 4 = 16)

Note : 1. Answer **ANY FOUR** questions, choosing at least **TWO** from each **Group.**

2. Each question carries **FOUR** marks.

Group - A

15. Compare the values of relative permeability and magnetic susceptibility of dia, para and ferro magnetic substances.   *(Unit - 8.5)*

16. What are the important applications of Laser light in science and technology.   *(Unit - 7.6)*

17. Show that effective resistance of a series combination in a circuit is equal to sum of the individual resistances.   *(Unit - 9.4)*

18. Explain different stages of TV communication with a block diagram.   *(Unit - 11.5)*

Group - B

19. Explain the formation of a triple in Nitrogen molecule.   *(Unit - 2)*

20. How does the following properties vary in a period and in a Group ? a) Atomic radius, b) oxidising property, c) Electronegativity, d) Electropositive character .   *(Unit - 3)*

21. What is drug ? Classify drugs depending upon their therapeutic action.   *(Unit - 10)*

22. Define the ionization energy. Mention the factors that influences it. *(Unit - 1)*

SECTION - IV (Marks : 1 × 5 = 5)

Note : 1. Answer **ANY ONE** of the following questions

2. This question carries **FIVE** marks..

23. Sketch the diagram of a Nucler Reactor showing various parts.   *(Unit - 10.4)*

24. Draw a diagram showing the manufacture of Sugar from Sugarcane. Label its parts.*(Unit - 8)*

| Time : 30 Minutes | **PART - B** | Marks : 15 |

Note : 1. Answer ALL questions. 2. Each question carries 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. Pick up the correct answer and fill in the brackets with the CAPITAL LETTERS of the correct answer chosen.　10 × 1/2 = 5

1. Which of the following rays are used to take photographs of objects in darkness ?　[　]
   A) Infra-red rays　　　B) Microwaves
   C) Ultra-violet rays　　D) Gamma rays

2. A body is projected vertically upwards with a velocity 40 m/s. the maximum height reached by the body is (Take g= 10 m/s^2) :　[　]
   A) 90 m　B) 80 m　　C) 60 m　D) 50 m

3. The distance between successive node and antinode is :　[　]
   A) $\lambda/2$　B) $\lambda/8$　　C) $\lambda/4$　　D) λ

4. Solid angle is measured in :　[　]
   A) Lumen　B) Candela　C) Phot　D) Steradian

5. The energy gap is highest in the case of : [　]
   A) Metal　　　　　　B) Insulator
   C) Semi-conductor　　D) Diode

6. CaO is :　[　]
   A) Acidic　　　　　B) basic
   C) Neutral　　　　D) amphotoric

7. If the PH of a solution is 10, its [H$^+$] is : [　]
   A) log 10　B) $\log_{10} 10$　C) 10^{-10}　D) $[-10]$

8. – COOR is called :　[　]
   A) Acid group　　　B) Amine Group
   C) Ester Group　　　D) Ketone group

9. Which of the following is the sweetest sugar ?　[　]
   A) Sucrose　　　　　B) Glucose
   C) Fructose　　　　D) Maltose

10. The catalyst used in hydrogenation of oils is :　[　]
   A) Al　　B) Ni　　C) Zn　　D) Mg

II. Fill in the blanks :　10 × 1/2 = 5

11. Screw gauge works on the principle of ....

12. Time of ascent is directly proportional to ....

13. The ozone layer protects us from .... radiations from the sun.

14. The S. I. unit of magnetic moment is ....

15. A sensitive instrument used to measure the small changes in the value of 'g' at a given location is ....

16. The number of sub-shells present in L-shell are ....

17. After filling the 3d orbital, the electron enters into .... orbital.

18. Alkenes undergo addition reactions because ....

19. The – CO – NH bond is called as ....

20. $H_2SO_4 + Ca(OH)_2 \rightarrow$ .... $+ 2H_2O$

III. Match the following.

i)　Group - A　　　　　　　Physics　　Group B　　5 × 1/2 = 2 1/2

21. Mouse	[　]	(A) Machine
22. Assembler	[　]	(B) 'o' or 1
23. Programme	[　]	(C) Output device
24. Bit	[　]	(D) Machine independent
25. Combiler	[　]	(E) Input device
		(F) Set of instructions
		(G) Translates programme from high level language to machine language.

ii)　Group - A　　　　　　　Chemistry　　Group B　　5 × 1/2 = 2 1/2

26. Aldehyde	[　]	(A) CH_3COCH_3
27. Ether	[　]	(B) $CH_3COOC_2H_5$
28. Amine	[　]	(C) CH_3OH
29. Ester	[　]	(D) CH_3COOH
30. Ketone	[　]	(E) CH_3CHO
		(F) CH_3OCH_3
		(G) $C_3H_7NH_2$

PART - B : ANSWERS

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

II.　(11) Screw, (12) initial velocity, (13) ultraviolet, (14) ampere - metre2 (A - m^2) (15) gravity meter (16) 2, (17) 4p, (18) having double bond, (19) peptide bond, (20) $CaSO_4$

III.　**(i)** (21) E (22) A (23) F (24) B (25) G　　**(ii)** (26) E (27) F (28) G (29) B (30) A