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(FOR THE CANDIDATES ADMITTED **24PCY101**

DURING THE ACADEMIC YEAR 20 ONLY) **REG.NO. :**

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : NOV-2024

MSc CHEMISTRY **MAXIMUM MARKS: 75**

SEMESTER-I **TIME : 3 HOURS**

PART – III-24PCY101

CORE-I-INORGANIC CHEMISTRY – I- SOLID STATE AND NUCLEAR CHEMISTRY

SECTION – A (10 X 1 = 10 MARKS)

CHOOSE THE CORRECT ANSWERS

1. Which of the following is inorganic benzene? (K1)

a) Borazine b) Diborane c) Meallo borane d) Carborane

2. Choose the BCC type of solid.

a) Fe b) Pb c) Ni d) Pt

3. Which one of the following is an example of Frenkel defect crystal? (K1)

(a) KCl (b) NaCl (c) AgCl (d) KBr

4. Which of the following particles cannot be accelerated using a cyclotron? (K1)

a) Neutron b) α-particle c) Deuteron d) Proton

5.What is the source of stellar energy? (K1)

a) nuclear fission b) nuclear fusion c) nuclear fission and fusion d) nuclear decay

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Define-Catenation.(K2)

7. What is radius ratio rule? (K2)

8. Defend- Frenkel defect (K2)

9. What is binding energy of a nucleus? (K2)

10. Define-Nuclear isomerism..(K2)

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) What are fullerenes? Explain their applications.**(K3)**

(OR)

b) Describe the Structure and bonding of phosphorus compounds .**(K3)**

12. a) Compare Frenkel defect and Scotty defect crystals.**(K3)**

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(OR)

b) Describe structure of zinc blende . **(K3)**

13. a) Explain the electrical properties of solids. **(K3)**

(OR)

b) Describe the band theory of solids. **(K3)**

14. a) Explain the liquid drop model theory of nucleus **(K3)**

(OR)

b) Describe the determination of half-life period of a element. **(K3)**

15. a) State and explain the nuclear fission theory.**(K3)**

(OR)

b) Compare nuclear fission and nuclear fusion reactions..**(K3)**

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4/K5)

16. a) Analyze the preparation, chemical properties and structure of Borazine.(K4)

(OR)

b) Defend the Wade's rule of various types of Boranes.(K5)

17. a) Discuss the types of solids with suitable examples..(K4)

(OR)

b) Summarize the Born-Haber cycle and its applications (K5)

18. a) Point out and explain the free electron theory of solids (K4)

(OR)

b) Discuss the various types of semiconductors..(K4)

19. a) Outline the principle and working function of G.M.counter with neat diagram.(K4)

(OR)

b) Analyze the principle and working function of Cyclotron.(K4)

20. a) Discuss the various types of nuclear reactions. (K4)

(OR)

b) Explain the applications of radio isotopes.(K5)

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