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(FOR THE CANDIDATES ADMITTED **SUB CODE 23PCY206**

DURING THE ACADEMIC YEAR 2023 ONLY) **REG.NO.**

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

END-OF-SEMESTER EXAMINATIONS : MAY 2024

M.Sc CHEMISTRY **MAXIMUM MARKS: 75**

SEMESTER : II **TIME : 3 HOURS**

PHYSICAL CHEMISTRY-II

QUANTUM CHEMISTRY AND NANO CHEMISTRY

SECTION- A (10x1=10MARKS)

ANSWER THE FOLLOWING QUESTIONS.(K1)

1.The source of energy used in the photo electric effect is _____
a) Radio frequency b) X-ray
c) UV-light d) Microwaves

2. Wave function in quantum mechanics represents _____
a) State of the system b) Shape of the system
c) Probability of the system d) Energy of the system

3. Bond order of nitrogen is _____
a) 3 b) 4 c) 5 d) 6

4. The thermal conductivity of carbon nanomaterial is
a) Very low b) Very high c) Moderate d) None of the above

5. Resolution of SEM is _____
a) 10 nm b) 20 nm c) 30 nm d) 40 nm

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

6. What is quantum chemistry?
7.Define: Approximation methods in quantum chemistry
8. Write a note on delocalization energy
9. Write a note on nano chemistry
10. Define: Photoluminescence

ETHICAL PAPER

SECTION B (5x5=25MARKS)

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

11. a) Write a note on the success of quantum theory

(OR)

b) Explain photo electric effect

12. a) Write a note on He atom in the ground state

(OR)

b) Give an account of the need for approximation methods

13. a) Give an account of the construction of anti-symmetric wave functions

(OR)

b) Write a note on determination of bond order

14. a) Write a note on carbon nanotube

(OR)

b) Give an account of properties of nano particle

15. a) Write a note on AFM

(OR)

b) Write a note on STM

SECTION C (5x8=40MARKS)

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

16. a) Write a note on time dependent and time independent Schrodinger equation

(OR)

b) Explain postulates of quantum mechanics

17. a) Explain shapes of wave functions and quantum numbers

(OR)

b) Write a note on variation methods applicable to H atom in the ground state

18. a) Discuss HMO treatment of ethylene and benzene systems

(OR)

b) Write a note on LCAO-MO treatment of diatomic molecule

19. a) Explain application of nanomaterials

(OR)

b) Write a note on bottom up approach

20. a) Explain principle and application of SEM

(OR)

b) Explain principle and application of TEM

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