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GIET UNIVERSITY, GUNUPUR – 765022
M. Sc. (Fourth Semester) Examinations, May ' 2021
PHPC 401 - STATISTICAL MECHANICS
(Physics)

Time: 2 hrs

Maximum: 50 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**

Q.1. Answer all the questions

- a. Give generalized equipartition theorem.
- b. Give equation of state in classical ideal gas.
- c. Explain grand canonical ensemble.
- d. Write a short note third law of thermodynamics.
- e. Draw and explain Hertzprung-Russell diagram.
- f. Give partition function in Pauli Para magnetism.
- g. Write and explain Planck's radiation law.
- h. State Liouville's theorem for quantum statistical mechanics.
- i. Explain Stefan's law.
- j. Write about paramagnetic susceptibility.

PART – B**(6 x 5 = 30 Marks)**Answer ANY FIVE questions

Marks

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| 2. Discuss and derive micro canonical ensemble. | (6) |
| 3. Discuss about equivalence of canonical and grand canonical ensemble. | (6) |
| 4. Derive and discuss Boltzmann-Einstein distribution. | (6) |
| 5. Derive average energy and position of a particle in box. | (6) |
| 6. Explain briefly theory of white dwarf stars. | (6) |
| 7. Explain 1 st order and 2 nd order phase transition. | (6) |
| 8. Discuss briefly about Bose-Einstein condensation. | (6) |
| 9. The absolute threshold of the dark-adapted human eye for the perception of light at 510 nm has been measured as 3.5×10^{-17} J. How many photons does this correspond to? | (6) |

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