B.Sc. DEGREE EXAMINATION,APRIL 2019
II Year III Semester
Mathematical Physics And Statistical Mechanics

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Define null matrix.
2. Define Eigen values.
3. What is the other name for beta function?
4. Define gamma function.
5. Write any one Bessel functions.
6. Give an example for spherical harmonics.
7. Define Ensemble.
8. Define phase space.
9. What is meant by Fermi Dirac statistics?
10. Define Bosons.
11. What are Macro states?
12. What is meant by square matrix?

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Find the Eigen values and Eigen vectors of the following matrix A $= \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$
14. List the properties of gamma function.
15. Give a short note on Bessel's Differential equation.
16. What is meant by Ensemble? And explain its types.
17. Write a short note on Bosons and Fermions.
18. Derive Cayley's-Hamilton theorem.
19. Discuss about the different forms of beta function.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Write in detail about Cayley's Hamilton theorem.
21. Prove that $\left\lceil \frac{1}{2} \right. = \sqrt{\pi}$
22. Derive Legendre's Differential equation.
23. Give the postulates of Statistical mechanics.
24. Derive Fermi-dirac distribution law.

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