RAN-1150

T.Y.B.Sc. Sem-VI Examination

March / April - 2019

Physics Paper - IX

Time: 2 Hours]   **[Total Marks: 50**

સૂચના : / Instructions

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ **T.Y.B.Sc. Sem-VI**

Name of the Subject :

☛ **Physics Paper - IX**

Subject Code No.: | **1** | **1** | **5** | **0** |

Seat No.:

Student's Signature

Q-l.   **Answer in Short.**   **[08]**

1) If all the particles in systems are fixed at definite position then what is the value of entropy?

2) What is meant by the system in thermodynamics?

3) What do you mean by Eigen value?

4) Write down the equation of pressure in terms of partition function.

5) What do you mean by anti-symmetric wave function?

6) Give an example of Boson.

7) What do you mean by four vector?

8) What do you mean by null line?

Q-2. (A)   Obtain the expression for average number of particles for B. E. Statistics. **[10]**

OR

Q-2. (A)   What is Gibbs' paradox? How can it be resolved?   **[10]**

Q-2. (B)   Derive the equation : $S = -k \sum_{s} Ps \ln Ps$ **[04]**

OR

Q-2. (B) Show how the work done by ideal gas during the isothermal expansion can be expressed in terms of change in entropy? **[04]**

Q-3. (A) Find the relativistic Hamiltonian of a single particle. **[10]**

OR

Q-3. (A) Derive the Lorentz gauge condition for Maxwell's equation to be invariant. **[10]**

Q-3. (B) Derive the position four vectors. **[04]**

OR

Q-3. (B) Represent the Lorentz Transformation geometrically. **[04]**

Q-4. **Attempt any TWO.** **[14]**

1) Give the physical interpretation of α.
2) Write a short note on velocity four vector.
3) State and prove equipartition theorem of energy.
4) Derive the mean occupation number for fermions.

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