

**Department of Physics**  
**Government Degree College Kishtwar**  
**B.Sc.3rd Semester Regular Batch 2021**

**Subject: PHYSICS(3<sup>rd</sup> Semester)**  
**Time:3 hours**

**Course Code: UPYTC-301**  
**Total Marks 80**

**Note:** Attempt any three questions from section-1, three questions from section-2 and one question from section-3.

The soft copy of answer book is to be sent to [ajay595shan@gmail.com](mailto:ajay595shan@gmail.com) within 3 hours after the commencement of exam.

**Section-1** **(6x3=18)**

- Q.1 What is difference between drift current and diffusion current.
- Q.2 What do you mean by digital and analog signal.
- Q.3 Derive the relation between Boyle's Temperature and critical temperature.
- Q.4 What is perfect differential.
- Q.5 Explain Phase space.
- Q.6 State and explain between the basic difference between classical and quantum statistics.

**Section-2** **(6x7=42)**

- Q.1. Explain the construction working and the Characteristic properties of Tunnel diode.
- Q.2 Explain common base connection and give all the characteristic of a common base configuration.
- Q.3 Draw the symbol for ***nnp and pnp*** transistor.
- Q.4 What is Heat engine. Explain the principle, working and define efficiency. Why cannot the efficiency of a heat engine be 100%.
- Q.5 What do you mean by entropy. Show that entropy of a system remain constant during reversible process.
- Q.6 Starting from the four thermodynamically potential derive the Maxwell thermodynamics relation.

**Section-3** **(2x10=20)**

- Q.1. Explain Mathematical analysis of Half wave rectifier. Calculate its average value of output current, Root mean square value of output current, efficiency of half wave rectifier.

Q.2 Derive Maxwell-Boltzmann relation. Discuss the graphical representation of ME speed distribution for molecules. How root mean square can be determined.