**UNIVERSITY OF THE PUNJAB**

B.S. 4 Years Program / Second Semester – 2019

Paper: Electricity & Magnetism (IT)
Course Code: PHY-122 / IT-12399   Part – II

Roll No. ...............

Time: 2 Hrs. 45 Min.   Marks: 50

## ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

**Question no.2: Write short answers of the following questions.**          (10×2=20)

1. State and explain Charle's law.
2. A gas is compressed at constant pressure at 0.3atm from volume of 8L to 3L. In this process 400J heat energy flows out of gas. Find the work done by the gas and the change in internal energy.
3. Discuss the efficiency of carnot cycle.
4. Show that for adiabatic process $PV^\gamma$=constant.
5. Find the relation between drift velocity and current density?
6. Explain Gauss's law briefly.
7. Differentiate between conductors and insulators.
8. What are the types of electricity? Give the units of electric current.
9. State Faraday's law of electromagnetic induction. Explain briefly.
10. What is Magnetic field? Describe right hand rule to find direction of electromagnetic field with the help of diagrams.

**Question no.3:**          (10+5=15)

a) Explain the experiment performed to find the expression of Coulomb's law. Also write its vector form and show that it obeys Newton's third law of motion.

b) An electric dipole consists of charges +2e and -2e separated be 0.78 nm. It is in electric field strength. Calculate the magnitude of Torque on the dipole, when the dipole moment is (i) parallel to (ii) antiparallel to the electric field.

**Question no.4:**          (10+5=15)

a) Find the magnetic force on a current carrying wire. Explain the phenomena with the help of diagrams.

b) A 200 turns solenoid having a length of 25cm carries a current of 0.30A. Find magnetic field B inside the solenoid.

# UNIVERSITY OF THE PUNJAB
### B.S. 4 Years Program / Second Semester – 2019

Paper: Electricity & Magnetism (IT)
Course Code: PHY-122 / IT-12399    Part – I (Compulsory)    Time: 15 Min.  Marks: 10

\ Roll No. in Fig. .....................

\ Roll No. in Words. ............

\ .............................

\ Signature of Supdt.:

## ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.
### Division of marks is given in front of each question.
### This Paper will be collected back after expiry of time limit mentioned above.

**Q.1.**  Encircle the right answer cutting and overwriting is not allowed.    **(10x1=10)**

1) Which is the process in which temperature of the system remains constant?
   a) Isochoric process
   b) Isobaric process
   c) Isothermal process
   d) None of these

2) In an open system, for maximum work, the process must be entirely
   a) irreversible
   b) reversible
   c) adiabatic
   d) none of these.

3) The efficiency of heat engine whose sink is at 17°C and source at 200°C is
   a) 65%
   b) 80%
   c) 38%
   d) 90%
   e) none of these.

4) The difference between $C_p$ and $C_v$ is equal to
   a) Molar gas constant
   b) General gas constant
   c) Plank's constant
   d) none of these

5) According to first law of thermodynamics
   a) Total internal energy of a system during a process remains constant
   b) Total energy of a system remains constant
   c) Work done by a system is equal to the heat transferred by the system
   d) None of the above

6) The force per unit charge is known as
   a) Electric field intensity
   b) Electric flux
   c) Electric potential
   d) none of these

7) The drift velocity in the free electron is responsible for the
   a) production of heat energy
   b) production of power
   c) production of current
   d) none of these

8) The work done in moving a positive charge from one point to another in an equipotential plane is
   a) positive
   b) negative
   c) zero
   d) none of these

9) An electromagnetic field exists only when there is
   a) Voltage
   b) current
   c) both a and b
   d) none of these

10) When the north poles of two bar magnets are brought close together, there will be
   a) Force of repulsion
   c) force of attraction
   b) No force
   d) none of these