AMRIT CAMPUS
Mid-Term Exam-2075
BSc CSIT/Frist Semester/Physics

Candidates are required to answer the questions in their own words as far as practicable

Full Marks: 60
Pass Marks: 24
Time: 3 hrs.

Set "B"

Group A

Attempt any Two question from this group *(2X 10=20)*

1. Explain the meaning of the term moment of inertia. Show that the K.E of rotation of a rigid body is $1/2IW^2$.
2. What is a memory circuit? Explain circuit operation of RS and D flip- flop.
3. Explain the theory of black body radiation? Why does this theory need quantum mechanical interpretation? Discuss how this interpretation became successful experimentally and theoretically.

Group B

Attempt any Eight questions from this group *(8X 5 =40)*

4. What do you mean by the terms Torque and Angular Momentum? Prove that the Torque is equal to the rate of change of angular momentum.
5. Explain the Chzochralski process of the single crystal growth.
6. Explain the energy spectrum of the electron in corresponding orbit of hydrogen atom.
7. Two charges $3x10^{-6}C$ and $-8x10^{-6}C$ are placed at a distance of 4cm and 5cm respectively from a central charge $-5x10^{-6}C$ on a straight line. Find the P.E of the system.
8. A child's merry -go - round of radius of 4m and mass 10kg has an 80kg mass standing at the rim. The merry- go – round coast on a frictionless bearing at 0.2 rev/sec. The man walks inwards 2m towards the center. What is the new rotational speed of merry – go -round?
9. Make the appropriate truth table to prove the following distributive law
   AB +AC = A(B+C)
10. Verify the relation:
    A + BC = (A+B) (A +C) using the truth table.
11. After being excited the electron of hydrogen atom eventually falls back to the ground state. This can take either in a single or in a series of jumps, the electron falling into lower excited states before it ends up in the ground state, that is n = 3. Calculate the different photon energies that may be emitted as the atom returns to the ground state.
12. Calculate the wavelength of the first line of the Balmer series if the wavelength of the second line of the series is $4.86 \times 10^{-7}m$.