

## Physics – BS 102

### B.E. (Chem. Engg.) – 1<sup>st</sup> Semester (MID-SEM-II – Mar 2022)

Max. Time: 1 hr

Max. Marks: 30

**Instructions:** Attempt all questions and assume the values, wherever necessary.

- Q.1 Short Answer questions (may explain briefly) (2\*5=10)
- a) Find the polarizing angle for a glass of refractive index 1.732. CO1
  - b) What are the characteristics of laser beam? CO1
  - c) What is Fermi level? CO2
  - d) Briefly describe the Meissner effect. CO4
  - e) Define ferroelectricity. CO4
- Q.2
- a) Distinguish between hard and soft magnetic materials based on B-H curve. (5)-CO4
  - b) Describe the phenomenon of superconductivity. Differentiate between Type1 and Type2 superconductors. Explain the isotope effect in Superconductivity (5)-CO4
- Q.3
- a) What is critical radius of nucleus? Explain how the growth of a crystal nucleus takes place, using the nucleation, growth process. (5)-CO5
  - b) In a Young's Double Slit experiment, what is the ratio of the irradiance at a distance 1 centimeter from the center of the pattern, irradiance of each individual beam entering through the slits (assume the same set up as before: light of frequency  $384 \times 10^{12}$  Hz, 0.05 centimeters between the slits, and a screen 1.5 meters away)? (5)-CO1

#### **OR (attempt (b) or (c))**

- c) With the help of suitable diagrams, explain the principle, construction and working of a He-Ne laser. (5)-CO1