

Code No: R161103

R16**SET - 1****I B. Tech I Semester Supplementary Examinations, May - 2018****ENGINEERING PHYSICS**

(Only Agri E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer the question in **Part-A** is compulsory3. Answer any **FOUR** Questions from **Part-B****PART -A**

1. a) Define electric polarization and electric susceptibility. (2M)
- b) Write any two applications of Michelson's interferometer. (2M)
- c) What are miller indices and draw the plane for (111). (2M)
- d) Mention any two differences between fission and fusion processes. (2M)
- e) Define reverberation and reverberation time. (2M)
- f) What are the characteristics of laser? (2M)
- g) Write the path difference for quarter wave plate and half wave plate. (2M)

PART -B

2. a) Derive an expression for the diameter of the n th dark ring in newton's rings viewed under reflection system. (8M)
- b) In Newton's rings experiment, the diameter of 10^{th} dark ring changes from 1.40cm to 1.27cm when a liquid is introduced between the lens and the glass plate. Calculate the refractive index of liquid. (6M)
3. a) Explain Rayleigh's criterion for resolution. Obtain an expression for the resolving power of a diffraction grating. (8M)
- b) A grating of width 2 inches is ruled with 15000 lines per inch. Find the smallest wavelength separation that can be resolved in 2^{nd} order at a mean wavelength of 500nm. (6M)
4. a) Describe Nicol prism, showing clearly how it is constructed and what is its action? (10M)
- b) Calculate the specific rotation if the plane of polarisation is turned through 26.4° traversing 20cm length of 20% sugar solution. (4M)
5. a) Explain how ultrasonic waves can be produced by Magnetostriction oscillator method. Also mention its advantages. (10M)
- b) Calculate the frequency of ultrasonics produced. [Given that thickness of quartz plate = 5.5×10^{-3} m]. (4M)
6. a) Describe the procedure for finding the miller indices. Show that for a cubic lattice, the distance between two successive planes is given by $d = \frac{a}{\sqrt{h^2+k^2+l^2}}$. (10M)
- b) The distance between (110) planes in a body centered cubic structure is 0.203nm. What is the size of unit cell and radius of the atom? (4M)
7. a) Derive an expression for internal field in a dielectric placed in field 'E'. (7M)
- b) Deduce Clausius-Mossotti relation. (7M)