



Engineering Physics - II (Old) (1090)

P. Pages : 2

Time : Three Hours

Max. Marks : 50

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Each question should be started on new page.
5. Figures to the right indicate full marks.
6. Assume suitable data if necessary.
7. Use of non programmable, electronic calculator is allowed.

1. Solve **any two**. 5
 - a) Derive Schrodinger's time dependent wave equation. 5
 - b) State and explain Heisenberg's uncertainty principle. 5
 - c) Find the lowest energy of neutron confined to a nucleus of size 10^{-14} m. (Given - Mass of neutron = 1.67×10^{-27} kg.) 5
2. Solve **any three**
 - a) Draw the construction of wind mill and explain its working. 5
 - b) Define reverberation time and explain how it can be adjusted to its best optimum value ? 5
 - c) Draw a diagram of magnetostriction generator and explain its working. 5
 - d) Define the terms 5
 - i) Nuclear fission
 - ii) Nuclear reactor
 - iii) Fill factor
 - iv) Moderator
 - v) Reproduction factor.

3. Solve **any one**.
- a) Calculate the acoustic intensity level at a distance of 10 meters from a source which radiates energy at the rate of 3.14 watts, using reference intensity of 10^{-12} W/m^2 . 5
- b) Draw an array of solar cells which supply 2 volt and 150 mA current output. Given, each cell supply 0.5 volt and 50 mA current when illuminated by light. Also calculate the wavelength of light absorbed by silicon cell having energy gap 1.2 eV. 5
4. Solve **any three**.
- a) Draw the construction of Michelson's interferometer and explain how it is used to determine the thickness of plates ? 5
- b) Show that when light is incident at polarizing angle, the reflected and refracted rays are at right angles to each other. 5
- c) State Rayleigh's criterion of resolution. Obtain an expression for resolving power of telescope. 5
- d) State any five engineering applications of polarization. 5
5. Solve **any one**.
- a) Calculate the possible order of spectra with a plane transmission grating having 18000 lines per inch, when light of wavelength 4500 \AA is used. 5
- b) Unpolarized light Falls on two polarizing sheet placed one on top of the other. What must be the angle between the characteristic directions of the sheets if the intensity of the transmitted light is one third intensity of the incident beam. 5
