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AOI1323

Engineering Physics - II
(Old) (1090)

P. Pages : 2

Time : Two Hours

Max. Marks : 50

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet 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. Figure to the right indicates full marks.
6. Use of non programmable calculator is allowed.
7. Assume suitable data if necessary.

1. Solve any two.

- a) What is De - Broglie's hypothesis ? Show that $\lambda = \frac{h}{\sqrt{2mE}}$ where λ is wavelength of de - Broglie wave, m is mass of particle and E, is kinetic energy of particle. 5
- b) Derive an expression for time dependent schrodinger's wave equation. 5
- c) The lowest energy of an electron confined in a potential well is 30ev. Calculate the width of the well. 5

2. Solve any three.

- a) What is reverberation ? State the factors by which reverberation can be controlled for best sound effect in the hall. 5
- b) Draw a neat labelled diagram of nuclear reactor and explain the use of moderator. 5
- c) State engineering applications of ultrasonics. 5
- d) Explain the construction and working of solar cell. 5

3. Solve any one.

- a) A auditorium hall has a volume of 8000m^3 . It is required to have reverberation time of 1.5 sec. Find out the total absorption in the hall. 5
- b) A 20 cm. Long ferro - magnetic rod vibrates longitudinally. Find the frequency of the ultrasonics produced, if young's modulus of elasticity of the rod is $1.2 \times 10^{11} \text{ N/M}^2$ and the density of the rod is $6 \times 10^3 \text{ kg/m}^3$. 5

4. Solve any three.

- a) Distinguish between fresnel diffraction and fraunhofer diffraction. 5
- b) Draw a neat labelled diagram of Michelson's inter ferometer. State its principle and applications. 5
- c) State and prove Brewster's law. 5
- d) Explain Rayleigh's criterion of resolution with suitable diagram. 5

5. Solve any one.

- a) How many lines per centimeter are there in a plane transmission grating which gives 1st order of light of wavelength 5800Å at angle of diffraction 60° ? 5
- b) A ray of light is incident on the surface of glass plate of R.I 1.732 at the polarizing angle. Calculate anlge of refraction of the ray. 5
