

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), February 2022

B. Tech. (Branch: CSE, ECE, ME), Semester - I

Roll No.....

AS1102; Scientific Perspectives

Time: 3 hours

Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data and diagram wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
4. Mobiles are not allowed during examination.
5. Non-programmable calculator is allowed.

- Q.1 Find the core diameter necessary for single mode operation at 850 nm in SI fibre with $n_1=1.480$ and $n_2=1.470$. What is its numerical aperture and maximum angle of acceptance of this fibre. Given $V = 2.405$. 03
- Q.2 Write a critical note on the Photodynamic and Sonodynamic therapy of Fullerene molecules. 03
- Q.3 How amorphous carbon is stabilized, and discuss the type of amorphous carbon based on hybridization and their important applications? 03
- Q.4 Explain that absorption and stimulated emission are equally probable in the presence of photon? Explain how essential requirements are fulfilled in Semiconductor Laser. 04
- Q.5 In a costume jewelry, rhinestones ($\mu=1.50$) are often coated with silicon monoxide ($\mu=2.0$) to make them more reflective. How thick should the coating be to achieve strong reflections for light of wavelength 5600 Å incident normally? 04
- Q.6 A small object of mass 1 mg is confined to move between two rigid walls separated by 1 cm. Calculate (a) de Broglie wavelength, and (b) Probability density at first excited state. 04

Q.7	Discuss how science differ from pseudoscience and analyze various steps for the scientific theory to develop.	04
Q.8	(A)- Explain how CNTs as good carrier agents of anticancer molecules in the drug delivery process. (2.5) (B)- How you can design diamonds to conduct electricity? Justify your answer with a suitable method. (2.5)	05