SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY
DEEMED UNIVERSITY

Course: B.E./B.Tech. Semester: II
Title of the paper: Applied Physics - II Max. Mark: 80
Sub. Code: ET 203B (2002/2003/2004/2005) Time: 3 Hours

PART – A (10 x 2 = 20)

Answer ALL the Questions

1. Define coefficient of viscosity of a liquid.
2. Write the equation of continuity of compressible and incompressible liquids.
3. State magneto caloric effect.
4. State any four basic requirements for a liquid to act as a refrigerant.
5. What is induced birefringence?
6. List out the properties of photo elastic material.
7. Calculate the energy released from the following fission reaction

$$^{235}_{92}u + ^{1}_{0}n \rightarrow ^{141}_{56}Ba + ^{92}_{36}Kr + 3\,^{1}_{0}n + Q$$

8. Define multiplication factor.
9. Define Half-Life period of a radio active material.
10. List out any four advantages of X-ray image intensifier.

PART – B (5 x 12 = 60)

Answer ALL the Questions

11. State and prove Bernoulli's theorem for liquid flowing through a pipe.

(or)

12. (a) Derive the Poiseuille's formula for the flow of a liquid through a capillary tube. (8)
(b) Describe the experimental determination of coefficient of viscosity of a given liquid using poisuille's formula. (4)

13. (a) Describe the liquefaction of oxygen by cascade process with the necessary diagram. (8)
(b) List out the merits and demerits of cascade process. (4)

(or)

14. State and discuss Joule Thomson effect with the help of the Porous plug experiment.

15. (a) Define photo elasticity. (2)
(b) Explain photo elastic method with suitable diagram. (4)
(c)State stress-optic law and obtain an expression for the same.(6)

(or)

16. Derive an expression for the intensity of the emergent light from a plane Polariscope with a stressed model. Also explain isoclinic and isochromatic fringes.

17. (a) Explain nuclear fusion with an example.
(b) Explain the sources of stellar energy with proton-proton cycle and carbon-nitrogen cycle.

(or)

18. (a) What is nuclear reactor?
(b) Explain the essential components of a nuclear reactor with a neat diagram.

19. (a) What is radiography? (2)
(b) How will you produce a X-ray Image using radiography? (4)
(c) What is fluoroscopy? (2)
(d)How will you produce a live X-ray image using fluoroscopy?(4)

(or)

20. (a) Explain the working principle of photo multiplier tube.
(b) How will you detect a gamma ray using scintillation detector with pmt.