LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **ADV.ZOOLOGY & PLANT BIOLOGY**

THIRD SEMESTER – NOVEMBER 2017

PH 3206 - PHYSICS FOR BIOLOGY

Date: 15-11-2017 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

PART A

Answer **all** questions: (10 × 2 = 20 marks)

1. Write the biological significance of viscosity.
2. What are the factors affecting surface tension of a liquid?
3. What is population inversion in laser?
4. Mention the characteristics of laser beam.
5. A light ray passes from air into a medium of refractive index 1.3. What is the speed of light in the medium? (Speed of light in air is $3x10^8$ m/s.)
6. What are the main differences between light microscopy and electron microscopy?
7. Define half-life in radioactivity.
8. Write the units of radioactivity.
9. What is a transducer?
10. How does a piezoelectric transducer work as a pulse sensor?

PART B

Answer **any four** questions: (4 × 7.5 = 30 marks)

11. Describe how you will measure the surface tension of a liquid by capillary rise method.
12. With necessary theory, describe the Stokes method to find viscosity of a liquid.
13. Describe the construction and working of Ruby laser with necessary diagrams.
14. With a neat schematic diagram, explain the optical principle of Interference microscope and write its uses.
15. a) Explain how radioactive dating is used to find the age of the earth. (5.5)
    b) The half-life of radon is 3.8 days. After how many days will only 1/16 of a radon sample be left over? (2)
16. Write a note about various forms of surface electrodes.

PART C

Answer **any four** questions: (4 × 12.5 = 50 marks)

17. Describe the capillary flow method of finding coefficient of viscosity of a liquid.
18. Explain the principle of operation of Nd-YAG laser with help of neat schematic and energy level diagrams.

19. Describe the optical principle of (i) Transmission Electron Microscope (TEM) and (ii) Scanning Electron Microscope (SEM).
20. Using the law of radioactive disintegration, derive expressions for half-life and mean-life of a radioelement.
21. What is a transducer? Describe the working of thermistor type transducer.
22. Describe the construction and working of He-Ne laser. Mention the advantages of a gas laser over a solid state laser.

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