AT–346

B.Sc. (Part—II) Semester—III Examination

3S : FORENSIC SCIENCE

(Forensic Physics)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) **ALL** questions are compulsory.

(2) Question No. **1** carries **8** marks. While each of the remaining question carry **12** marks.

1. (a) Fill in the blanks : 2

(i) Father of microscopy is _____.

(ii) The angle made by the incident ray with normal is called _____.

(iii) The bullet examination done in _____ microscope.

(iv) The acronym LASER stands for _____.

(b) Multiple choice question : 2

(i) Air resistance is a part of :

(a) External ballistic (b) Internal ballistic

(c) Terminal ballistic (d) Wound ballistic

(ii) Comparison microscope was invented by :

(a) Albert S. (b) K.K. Singh

(c) Calvin Goddard (d) Edmond Locard

(iii) In Helium—neon laser, mixture of helium and neon is in the ratio of about :

(a) 1 : 10 (b) 10 : 1

(c) 1 : 1 (d) 1 : 5

(iv) Optical fiber works on the principal of :

(a) Reflection (b) Refraction

(c) Total internal reflection (d) Diffraction

(c) Answer in **one** sentence : 4

(i) Define microscope.

(ii) What is Terminal ballistic ?

(iii) What is Abbe's condenser ?

(iv) What is numerical aperture ?

UNIT—I

2. (a) Describe the construction and working of helium-neon laser. 6

(b) What is laser ? State the properties of laser. 3

(c) Explain spontaneous emission. 3

OR

3. (p) Describe the structure of optical fiber. 2

(q) Explain with neat diagram step index fiber and graded index fiber. 3

(r) Draw a block diagram of fiber optical communication system and explain. 4

(s) What is Solar cell ? Explain its working. 3

UNIT—II

4. (a) Give the brief account of nuclear charge and nuclear spin. 4

(b) Define half life time. If decay constant of uranium is 0.0330 per year, determine its half life time. 4

(c) Give the brief account of nuclear properties. 4

OR

5. (p) What are the laws of radioactive disintegration ? Derive the relation $N = Noe^{\lambda t}$. 4

(q) State the basic principle of radiometric dating. What are most common types of radiometric dating ? 4

(r) Give the applications of radioisotopes. 4

UNIT—III

6. (a) Define external ballistic and state the basic consideration regarding Flight of a projectile. 4

(b) What is bullet ? Explain different types of bullet. 4

(c) Explain the theory of recoil. 4

OR

7. (p) Explain ballistic coefficient in detail. 4

(q) Derive an expression for angle of elevation of the barrel. 4

(r) Write in brief velocity recoil. 4

UNIT—IV

8. (a) Explain photography in detail. 4

(b) Write down the features of 35 mm DSLR. 4

(c) Discuss any four photo imaging evidences. 4

OR

9. (p) Explain characteristics of FET. 4

(q) Discuss the term optical fiber communication system. 4

(r) Describe the method of radiation detection. 4

UNIT—V

10. (a) Explain the following terms :

(i) Air resistance

(ii) Gyroscopic drift 4

(b) Write in brief about remaining velocity. 4

(c) Write twist verses stability. 4

OR

11. (p) Write down the lethal effects of ricochet bullet. 4

(q) Discuss the velocity of falling shot and falling bullet. 4

(r) Define bore. Add a note on canting. 4

UNIT—VI

12. (a) Write down basics of microscope. 4

(b) Explain Transmission Electron Microscopy (TEM). 4

(c) What is comparison microscope and write down the application of it ? 4

OR

13. (p) Define Numerical aperture. Explain why it is important in image magnification. 4

(q) Write the applications of polarizing microscope. 4

(r) What are the different parts of compound microscope ? 4