AS–1422

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

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 questions carries 12 marks.

1. (a) Fill in the blanks :

(i) Study of motion of projectile is called _____.

(ii) To gather the light is the function of _____.

(iii) In an optical fiber the refractive index of core material is ___ ____ than that of cladding material.

(iv) Nuclear forces are _____ range forces. 2

(b) Multiple Choice Questions :

(i) Ruby laser is a :

(a) Semiconductor laser (b) Solid state laser

(c) Gas laser (d) Liquid laser

(ii) The nuclei having same number of protons but different number of neutrons are called :

(a) Isotopes (b) Isobars

(c) Isotones (d) Isochores

(iii) Total internal reflection may occur when light travels from :

(a) Rarer to denser medium (b) Denser to rarer medium

(c) Along the normal (d) Perpendicular to normal

(iv) The time in which the half substance is disintegrated is called :

(a) Half life period (b) Radioactivity

(c) Mass defect (d) Binding energy 2

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

(i) Define Compound Microscope.

(ii) What is Refraction ?

(iii) What is Internal Ballistic ?

(iv) What is Function of Condenser ? 4

UNIT–I

2. (a) Describe the construction and working of ruby laser. 5

(b) State the industrial applications of laser. 4

(c) Explain stimulated emission. 3

OR

3. (p) How propagation of light takes place in optical fibers ? 3

(q) What is Solar Cell ? Explain its working. 3

(r) Derive an expression for numerical aperture of step-index fiber. 3

(s) State the applications of optical fiber. 3

UNIT–II

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

(b) Define radioactive disintegration. State and explain the laws of radioactive disintegration with graph. 4

(c) Define Half Life Time. If half life time of uranium is 20 years, determine its decay constant. 4

OR

5. (p) Give the applications of radioisotopes. 4

(q) Give a brief account of nuclear properties. 4

(r) Give a brief account of nuclear composition :

(i) Nuclear Spin.

(ii) Nuclear Size. 4

UNIT–III

6. (a) Define Ballistic. Give brief account on Internal Ballistic. 4

(b) Explain barrel pressure measurement. 4

(c) Write in brief on firing mechanism. 4

OR

7. (p) Give a brief account on the Recoil Velocity. 4

(q) If you have found 1 bullet on crime scene, as an expert what will you do ? 4

(r) Define Caliber. Explain the working mechanism of pistol. 4

UNIT–IV

8. (a) Explain forensic significance of Photography. 3

(b) Write on the following terms :

(i) Angle

(ii) Scale

(iii) Depth of field. 6

(c) Give an account on crime scene investigation report writing. 3

OR

9. (p) Discuss Digital Photo Imaging. 4

(q) Explain the phenomenon of piezoelectricity. Discuss its applications. 4

(r) Explain the principle, construction and working of G.M. Counter. 4

UNIT–V

10. (a) Explain the following terms :

    (i) Wind Deflection.

    (ii) Bullet Drop.

    (iii) Canting. 6

    (b) Define External Ballistic. State the basic consideration regarding flight of a projectile. 3

    (c) Discuss maximum horizontal and vertical range of shot pellet. 3

OR

11. (p) Explain the relationship between the angle of incidence and ricochet. 3

    (q) Discuss the stability in flight after ricochets. 3

    (r) Explain lethal effects of ricochet bullet. 3

    (s) Write in brief on the escape velocity. 3

UNIT-VI

12. (a) Describe the following terms :

    (i) Refraction.

    (ii) Reflection.

    (iii) Resolution. 6

    (b) Explain scanning electron microscope with applications. 3

    (c) Add a note on comparison microscope. 3

OR

13. (p) Differentiate between SEM and TEM. 4

    (q) Explain the advantages of light microscope over compound microscope. 4

    (r) Explain the disadvantages of Compound Microscope. 4