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 questions carries **12** marks.

1. (A) Fill in the blanks :—
(i) The Barrel consists of Muzzle and _____ end.
(ii) The DSLR stands for _____ .
(iii) An optical fiber is a _____ rod usually made of glass or clear plastic.
(iv) _____ Pumping is used in ruby laser. 2

(B) Multiple Choice questions :—
(i) The main components of any laser system are :
(a) Active Medium (b) The Resonator Cavity
(c) Pumping Source (d) All of these
(ii) Colour temperature is related with :
(a) ISO number (b) Shutter speed
(c) Aperture (d) White balance
(iii) Which method is used to measure barrel pressure ?
(a) Displacement Method (b) Strain Gauge Method
(c) Electrostatic Method (d) Borderline Method
(iv) In optical fiber, dispersion means, pulse :
(a) narrowing (b) distortion
(c) broadening (d) None of the above

(C) Answer in **one** sentence :— 2
(i) What is Crime Scene Photography ?
(ii) What is Balastic coefficient ?
(iii) What is Polarizing Microscope ?
(iv) Define Metastable State. 4

2. (A) What is Laser ? State the properties of laser. 4
(B) Explain Spontaneous and Stimulated emission. 4
(C) Describe construction and working of Ruby laser. 4

OR

3. (P) Describe the structure of Optical fiber and explain the phenomenon of total internal reflection. 4
(Q) Explain the principle used in Optical fiber for the propagation of light. 4
(R) Mention any four applications of Optical fiber. 4

4. (A) Define half life and explain nuclear properties. 4
(B) What is Radioactive disintegration ? Derive the relation $N = No\ e^{\lambda}$. 4
(C) Give the applications of Radio isotopes. 4

OR

5. (P) Give a brief account of nuclear composition :
   (i) Nuclear spin (ii) Nuclear size 5
   (Q) State and explain principle of Radiometric dating; explain its types. 4
   (R) If decay constant of Uranium is 0.0330 per year determine the half life period. 3
6. (A) Explain any two methods of measurement of barrel Pressure. 4
   (B) What is ballistics ? What are different types of ballistics ? 4
   (C) Explain the angle of elevation of the barrel. 4

OR

7. (P) What is ballistic coefficient and sectional density ? 4
   (Q) What is Fire arm ? What are different components of firearm ? 4
   (R) In 12 gauge slugger shotgun whose diameter of barrel is 0.729 inch, length of barrel is 21 inch, mass of projectile is 437 grains, velocity of projectile is 1694.75 FPS. Find out Barrel Pressure. 4
8. (A) What is DSLR Camera ? Explain its working. 4
   (B) Explain Forensic Photography with its types. 4
   (C) Give in detail Digital Photo Imaging. 4

OR

9. (P) Explain Geiger Muller counter. 4
   (Q) Explain the following terms :
   (i) Depth of field
   (ii) Ambient light 4
   (R) Explain crime scene photography. 4
10. (A) Explain the following terms :—
   (i) Angle of ricochet
   (ii) Angle of incidence
   (iii) Escape velocity. 3
   (B) Derive equation for parabolic trajectory of a bullet. 5
   (C) Explain maximum horizontal and vertical range of shot pellets. 4

OR

11. (P) Explain lethal effects of ricochet bullet. 4
   (Q) Explain counting and wind direction. 4
   (R) What do you mean by air resistance and bullet drop ? 4
12. (A) Explain Compound Microscope with its parts and properties. 4
   (B) Explain Comparison Microscope. 4
   (C) Explain Scanning Electron Microscope. 4

OR

13. (P) What do you mean by microspectrophotometer ? 4
   (Q) Explain the terms :—
   (i) Analyzer (ii) Polarizer 4
   (R) Explain Transmission Electron Microscope. 4