SPK/KW/12–2376

Second Semester *B. Sc. Forensic Science* Examination

Paper – III

BASICS OF FORENSIC PHYSICS

Time : Three Hours] [Max. Marks : 30

N. B. : All questions are compulsory and carry equal marks.

1. EITHER

(A) Explain :

(i) Optical absorption.

(ii) Spontaneous emission.

(iii) Stimulated emission. 4

(B) What are the important characteristics of Laser ? 2

(C) What is solar cell ? State its characteristics. Define conversion efficiency of solar cell. 4

OR

(E) What is optical fibre ? What do you mean by

(i) critical angle of propagation and

(ii) angle of Acceptance ? 6

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(F) In an optical fibre, the refractive index of clad material is 1·3 and that of core material is 1·6. What are the values of critical angle and angle of acceptance ? 4

2. EITHER

(A) What is mean life ? Show that the mean life of a radioactive substance is reciprocal of the decay constant λ. 4

(B) State the use of radio isotopes in the field of medical science. 3

(C) The half life period of radium is 1590 years. In how many years will one gram of pure element lose one centigram ? 3

OR

(E) State properties of α – particle. 3

(F) State and explain Soddy Fajan's displacement law. 3

(G) Calculate time required for 10% of a sample of thorium to disintegrate if the half life period is $1{\cdot}4 \times 10^{10}$ years. 4

3. EITHER

(A) Find the differential equation for a circuit in which a charged capacitor is discharged through an inductor L and resistor R in series. 4

(B) Draw circuit diagram of bridge rectifies and explain in brief. 2

(C) Explain the working of N–P–N transistor. 4

OR

(E) Draw a circuit diagram to study the common base characteristics of a transistor. Give its input and output characteristics. What is α ? 5

(F) Construct a RS flip flop using NOR gates and explain its working. 5