Roll No. ..... [Total No. of Pages : 4

PHY–1843

B. Tech. (First Semester)

EXAMINATION, 2020

ENGINEERING PHYSICS

Time : Three Hours

Maximum Marks : 50

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 2 marks. 10×2=20

1. Why can two independent sources of light produce interference ?
2. Define inertial and non-inertial frames of reference.

3. How will you show that no particle can move with a velocity greater than the velocity of light in an inertial frame ?
4. Define proper and improper time interval.
5. Define the phenomena of double refraction.
6. Explain the conditions to obtain sustained interference.
7. Differentiate between spontaneous and stimulated emission. Which one is required for laser ?
8. Explain the construction and working of Ruby laser in short.
9. Give four important applications of Laser.
10. On her 16th birthday a young lady decides that she will like remain 16 for at least 10 years. She decides to go on journey into outer space with uniform velocity. What is the minimum speed she must move relative to the laboratory so that when she returns after 10 years

(relative to laboratory) she can still say, quit truthfully that she is only 16.

11. What is the principle of operation of an optical fiber ?

12. Define acceptance angle and numerical aperture.

13. Define resolving power of an optical instrument.

14. Write a note on attenuation.

15. How fast would a rocket have to go relative to an observes for its length to be contracted to 99% of its length at rest.

Section—B

(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 15 marks. 2×15=30

1. Derive the expression for time dilation. With the help of an experimental evidence show that time dilation is a real effect.

2. Describe construction and reconstruction of a Hologram. Write main applications of Holography.

3. Describe various types of optical fibers based on modes, material and refractive index profile.

4. (a) Explain the construction and working of Nicol prism.

   (b) Why are Newton rings formed in circular shape ? Explain it.