Seventh Semester B.Tech. Degree Examination, October 2018  
(2013 Scheme)  
13.705.4 – OPTOELECTRONIC DEVICES (T)  
(Elective – III)

Time : 3 Hours  
Max. Marks : 100

*Instruction* : Answer all questions of Part – A and one question from each Module of Part – B.

**PART – A**

*Each question carries 2 marks.*  
1. Give the reason for Franz Keldysh effect.  
2. Describe axial laser mode.  
3. What is the need of external modulation in optical communication system ?  
4. Explain electro optic effect.  
5. Write notes on Bragg modulator.  
6. What do you mean by responsivity of photodiode ?  
7. Give the advantages of Schottky barrier photodiode.  
8. Give the working principle of optical isolator.  
9. What are optical attenuators ?  
10. Define optical bistability. Give an example of an optical bistable device.

**PART – B**

*Each question carries 20 marks.*  

**Module – 1**

11. a) Explain the working of different kinds of quantum well lasers used in fibre optic communication.  
    b) Explain modulation of laser.
12. a) Explain the terms stark effect, inverse stark effect and stark splitting.  
    b) With energy level diagram describe Zeeman effect.

**Module – 2**

13. a) With a block diagram explain the difference between electronic switching and optical switching? Give the application of optical switching.  
    b) Describe about optical cross connect architecture.

14. a) What is acousto optic effect? Explain about Raman-Nath modulator operating on this principle.  
    b) Write notes on Franz-Keldysh modulators.

**Module – 3**

15. a) Give the principle of operation of optical detectors. Explain the working principle of PIN photo diode.  
    b) Explain the working principle of APD showing the diagram of electric field.

16. a) Explain about integrated transmitters.  
    b) Write notes on guided wave devices.

**Module – 4**

17. a) With a diagram explain 2x2 fiber coupler.  
    b) Define splitting ratio, excess loss, insertion loss and return loss.  
    c) Write notes on multiplexers.

18. Write notes on:
    1) Fiber grating filter.  
    2) Tunable filters.  
    3) Wavelength converters.