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## Paper ID [EC507]

(Please fill this Paper ID in OMR Sheet)

**M.Tech.**

### OPTICAL COMMUNICATION SYSTEMS (ECE - 506/507/EC - 05)

Time : 03 Hours

Maximum Marks : 100

#### Instruction to Candidates:

- 1) Attempt any **Five** questions.
- 2) All questions carry equal marks.

- Q1)** List and explain the recent developments in the field of optical communication. How the nonlinear effects are restricting the data rates? Explain.
- Q2)** (a) What does the term transparent window means? Specify three peak wavelengths for the transparent windows in modern optical fibers.  
(b) Draw & explain the GaAlAs double heterostructure LED.
- Q3)** (a) How does responsivity depends on the wavelength of a photodiode? Explain with suitable mathematical treatment.  
(b) List & explain optical & current confinement methods.
- Q4)** (a) What do you understand by SOA. List its application, advantages & disadvantages.  
(b) Which pumping wavelength 980 nm or 1480 nm is preferred & Why?
- Q5)** What is soliton ? How it is used in WDM systems to manage the impairments. Explain with the help of suitable diagram and mathematically prove your statement.
- Q6)** (a) Consider a 5-channel FDM system having carriers at  $f_1, f_2=f_1+\Delta, f_3=f_1+2\Delta, f_4=f_1+3\Delta$  &  $f_5=f_1+4\Delta$ , where  $\Delta$  is the spacing between the carriers. On a frequency plot show that number & location of the triple beat and two tone third-order intermodulation effects.  
(b) What is SCM? Explain and list its applications.

**Q7)** Explain the key system requirements for analyzing a optical fiber link.

**Q8)** (a) What do you understand by cutoff wavelength? Explain

(b) What is photo-multiplier and how it works? List its applications and advantages.