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**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Optical Networking**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART – A**

- 1 a. What is the need for multiplexing in an optical fiber? Explain the different multiplexing techniques for increasing transmission capacity of an optical fiber. (07 Marks)
- b. Briefly explain solitons. (03 Marks)
- c. Discuss the different types of WDM architecture with neat diagram. (10 Marks)
- 2 a. What are isolators and circulators? Explain the principle of operation of isolators and circulators. (10 Marks)
- b. Explain the applications for different optical filters in optical networks and mention any four characteristics of good optical filter. (10 Marks)
- 3 a. Explain the principle and operation of photodetector. Show that the responsivity  $R = (n\lambda)/(1.24)$  Amp/w where  $\lambda$  in  $\mu\text{m}$  and  $n$  is quantum efficiency. (10 Marks)
- b. What are the main considerations in building large switches? Compare the different types of switch architectures. (10 Marks)
- 4 a. With the help of a block diagram, explain various components of WDM link. (07 Marks)
- b. What are intrachannel and interchannel cross talk? Explain how switch crosstalk can be reduced by spatial dilation and wavelength dilation approach. (10 Marks)
- c. Mention the forms of dispersion which arise in optical communication systems. (03 Marks)

**PART – B**

- 5 a. Explain with neat diagram different elements of a SONET/SDH infrastructure. What is grooming in connection with a SONET/SDH. (10 Marks)
- b. With the neat diagram, explain the four sublayers of SONET/SDH layers. (07 Marks)
- c. Briefly explain the three sublayers of optical layer. (03 Marks)
- 6 a. What are the different types of wavelength conversion techniques and explain with neat sketches. (10 Marks)
- b. What are static and reconfigurable networks? (05 Marks)
- c. Briefly explain the routing and wavelength assignment problem. (05 Marks)
- 7 a. With a neat diagram of overview of network management in a typical optical network, explain different functions of network management. (10 Marks)
- b. Explain the different types of protection techniques for point to point links that comes under fault management. (10 Marks)
- 8 a. With the neat diagram, explain the architecture of an access network. (10 Marks)
- b. With the neat diagrams, explain the passive optical networks. (PON). (10 Marks)