

SUBJECT CODE NO:- P-317
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E. (ECT/EC/E&C) Examination MAY/JUNE-2016
Optical Fiber Communication
(Revised)

[Time: Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B

- i) Question No.1 and 6 are compulsory.
- ii) Attempt any two questions from section A and B from remaining
- iii) Figures to the right indicate full marks.
- iv) Assume suitable data wherever necessary.

Section A

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|-----|--|----------------------|
| Q.1 | Explain the following. (<u>Attempt any five</u>) | 10 |
| | <ol style="list-style-type: none"> a) Acceptance cone of a fiber b) Manmade fiber c) Step index fiber d) Rayleigh scattering loss e) Bandwidth-length product f) LED materials g) Bit error rate | |
| Q.2 | <ol style="list-style-type: none"> a) Discuss the various advantages offered by an optical fiber. b) Draw and explain the schematic diagram consisting of the main components of a fiber optical communication system. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) With the help of layered structure explain the working of ‘Reach through APD’. Also state its advantages and disadvantages. b) An LED with NA = 0.25 and an output diameter of $80\mu m$ is coupled to a fiber with core diameter of $62.5\mu m$ and NA = 0.24. Calculate the total mismatch loss and the power coupled into the fiber, if the LED power is $900\mu w$. | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) Explain intermodal and intramodal dispersion which is occurring in optical fiber in detail. b) An LED having a spectral width of 18nm is used as a light source. The length of optical fiber used is 25km. At the output it is observed that the pulse is spreading because of material dispersion. The value of pulse spreading is 1.76ns/km. Calculate the amount of material dispersion. | 08
07 |
| Q.5 | Write short notes on the following. (<u>Attempt any three</u>) | |
| | <ol style="list-style-type: none"> a) Photo detector parameters b) Optoisolators c) Coupling losses d) Splices and connectors | 05
05
05
05 |

Section B

- Q.6 Explain the following (Attempt any five): 10
- a) Bidirectional WDM
 - b) System margin
 - c) Photonic switching
 - d) OTDR
 - e) Optical Ethernet
 - f) Optical power measurement
 - g) Eye design test
- Q.7 a) Describe the concept of link power budget and rise time budget. 08
b) What is optical networking? What are the components used in it? Briefly explain each of these components. 07
- Q.8 a) What are the various standard protocols used in optical networking? Explain 'SDH' in detail. 08
b) What is WDM network? What are its features? Explain in detail. 07
- Q.9 a) What are the applications of OTDR? Explain any one in detail. 08
b) Why OPM is used? Explain the three layers of OPM. 07
- Q.10 Write short notes on the following:
- a) Noise penalties 05
 - b) SONET 05
 - c) Measurement standards 05