Registration No. | | | | | | | | | |

M.E./M.Tech. Degree Examinations, January 2017

First Semester

COMMUNICATION SYSTEMS

CU16104 – OPTICAL NETWORKS

(Regulation 2016)

QP Code: 148943

Time: Three hours **Maximum : 100 marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. What is the function of Isolators?
2. What do you mean by the term Numerical Aperture?
3. Write down the advantages of SONET over PDH.
4. Write the function of optical add drop multiplexer (OADM).
5. What are the advantages of wavelength routing networks?
6. What are the objectives of virtual topology?
7. What is PON?
8. What do you mean by broadcast networks & how it does differ from switch based networks?
9. What do you mean by optical safety?
10. Distinguish between inter channel & intra channel crosstalk.

PART B - (5 X16 = 80 Marks)

11. (a) (i) Explain the operation of Mach Zehnder Interferometer Multiplexer? **(10)**

(ii) Explain the functioning of three port and four port circulator. **(6)**

(OR)

(b) (i) Explain the principle and operation of Erbium Doped Fiber Amplifiers with neat diagrams. **(10)**

(ii) Calculate the numerical Aperture, Acceptance Angle and Critical Angle of the fiber having n_1=1.50 and n_2=1.45. **(6)**

12. (a) Explain in detail about SONET framing and overheads with diagrams. **(16)**

(OR)

(b) Explain briefly the test beds for Broadcast and select WDM networks. **(16)**

13. (a) Describe in detail about the optical layer cost tradeoff considering point to point WDM, hubbed WDM and fully optical design approaches with suitable examples. **(16)**

(OR)

(b) Discuss the principle of routing & wavelength assignment in wavelength routing networks. **(16)**

14. (a) Discuss the optical TDM, demultiplexing and synchronization schemes for photonic packet switching networks. **(16)**

(OR)

(b) Explain in detail the architecture of optical access networks and future access networks. **(16)**

15. (a) Explain the network management and various associated control operation in optical networks. **(16)**

(OR)

(b) Consider the transmission system engineering consisting of transmitter, optical amplifiers and receivers etc., Compute the power penalty in each of the components by assuming associated transmission impairments. **(16)**