Total No. of Questions : 12]

SEAT No. :

P4927

[Total No. of Pages : 3

[4959]-126
B.E. (Electronics)
(C) : OPTICAL AND MICROWAVE COMMUNICATION
(Semester -II)(Elective - III)
(2008 Pattern)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6from Section-I, and Q7 or Q8,Q.9 or Q.10, Q.11 or Q.12 from Section-II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Use of calculator is allowed.***
6) ***Assume Suitable data if necessary***

SECTION - I

Q1) a) Explain basic block diagram of optical fiber communication system in detail. **[8]**

b) Describe different types of fibers and their characteristic in detail. **[8]**

OR

Q2) a) Compare the following terms. **[8]**

i) Step index fiber and Graded index fiber

ii) Pin photodiode and Avalanche photodiode

b) Explain in detail the different types of modulators. **[8]**

Q3) a) What is dispersion? Explain material dispersion in detail. **[8]**

b) A multimode graded index fiber exhibits total pulse broadening of 0.1 μ sec over a distance of 12km. Calculate i)The maximum possible bandwidth of the link assuming no intersymbol interference ii) The pulse broadening per unit length iii) The bandwidth length product of fiber. **[8]**

P.T.O.

OR

Q4) a) Explain the concept of Wavelength Division Multiplexing along with neat diagram. State the key features of the same. **[8]**

b) Explain the concept of self phase modulation of SONET/SDH optical network. **[8]**

Q5) a) Explain interferometric method of measurement of length in detail. **[8]**

b) Describe in short the measurement techniques of current, voltage and liquid level. **[6]**

c) Write a short note on medical applications of lasers **[4]**

OR

Q6) a) Write short notes on the following. **[12]**

i) Removal of tumours of vocal cards

ii) Brain Surgery

iii) Laser instruments for surgery

b) Describe the laser heating, welding and trimming of material. **[6]**

SECTION - II

Q7) a) Explain the following terms: **[6]**

i) Cut off wavelength

ii) Guide wavelength

iii) Group velocity

iv) Phase velocity.

b) State and explain the properties of S parameter. **[6]**

c) Write an [S] matrix of a magic -Tee. Describe any one application in detail. **[4]**

OR

Q8) a) Explain the construction and working of an isolator in detail. **[6]**

b) State and explain the performance parameters of directional coupler. **[6]**

c) For the directional coupler the incident power is 400 mwatts. Calculate the power in the main arm and auxillary arm. The coupling factor is 13 dB. **[4]**

Q9) a) A reflex klystron operates at the peak mode of n = 2 with V_0 = 280V, I_0 = 22mA and a signal voltage V1=30V. Determine: **[8]**

i) The input power

ii) The output power

iii) Efficiency

b) Enlist the different types of magnetron. Explain how mode jumping is avoided in magnetron. **[6]**

c) Differentiate between Klystron and TWT. **[4]**

OR

Q10)a) Explain the construction and working of reflex klystron in detail. **[8]**

b) Explain how oscillations are sustained in cavity magnetron. Assume π mode of oscillations. **[6]**

c) Explain how helical TWT achieves amplification. **[4]**

Q11)a) Explain the principle of operation, IV characteristic of microwave tunnel diode. **[8]**

b) Explain terrestrial and satellite based microwave communication system in detail. **[8]**

OR

Q12)Write short notes on the following along with applications. **[16]**

a) Varactor diode

b) Microwave transistor

c) Schottky diode

d) PIN diode