Total No. of Questions : 8]

SEAT No. :

P3106

[Total No. of Pages : 3

[5354]-596
B.E. (Electronics Engg.)
OPTICAL AND MICROWAVE COMMUNICATION
(2012 Pattern) (End Semester)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Define fiber splicing. Explain different types of splicing. **[6]**

b) Compare the following terms. **[8]**

i) Step Index fiber and Graded Index fiber

ii) Pin Photodiode and Avalanche Photo Diode.

c) State and explain the desirable properties of a source for optical fiber communication links. **[6]**

OR

Q2) a) Explain the construction and working of LASER diode. Compare LED with LASER. **[6]**

b) An installed fiber has following specifications :- Core diameter = 62.5 μm; refractive index of core = 1.48 and of cladding = 1.46. Its operating wavelength is 1310 nm. Calculate. **[8]**

i) Critical angle

ii) NA

iii) Acceptance angle in air

iv) Normalised frequency

v) No. of modes of fiber

c) Explain the applications of Fiber Bragg gratings for multiplexing and Demultiplexing function. **[6]**

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Q3) a) Explain the terms with respect to wave guide. **[6]**

i) Dominant mode

ii) Cut off frequency

iii) Guide wavelength

b) Expalin any two application of circulator. **[6]**

c) The collinear ports 1 and 2 of a Magic Tee are terminated by impedances of reflection coefficients $\rho_1 = 0.5$ and $\rho_2 = 0.6$. The difference port 4 is terminated by an impedance with reflection coefficient of 0.8. If 1W power is fed at sumport 3, calculate the power reflected at port 3 and the power divisions at the other ports. **[6]**

OR

Q4) a) Explain construction and working of Isolator based on Faradays rotation principle. **[8]**

b) Determine the S matrix of a 3port circulator with insertion loss of 0.5 dB, isolation of 20dB and vsw R of 2. **[6]**

c) State and explain applications of Magic tee. **[4]**

Q5) a) Explain the construction and working of TWT (Travelling Ware Tube) in detail. **[8]**

b) What are the limitations of conventional tubes at microwave frequencies. **[8]**

OR

Q6) a) Explain the construction and working of multicavity klystrone Amplifier. **[8]**

b) Explain construction and working of cavity magnetron. **[8]**

Q7) a) Explain power frequency limitations of microwave BJT. **[8]**

b) Explain the principle of operation, Iv characteristics of microwave tunnel diode. **[8]**

OR

Q8) a) Write short notes on the following along with applications. **[8]**

i) Schottky diode

ii) Gunn diode

b) Explain the equivalent circuit of Varactor diode. Explain in detail its construction and operation. **[8]**

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