

Sample Test Paper-I

Course Name : Electronics Engineering group

Course Code : EJ/ET/EN/EX/DE/ED/EI

Semester : Sixth

Subject Title : Advanced Communication System

Marks : 25

17656

Time: 1 hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE

(3x3=9marks)

- a) State the advantages of waveguide over two wire transmission line (any 4)
- b) Define cut off frequency, phase velocity, group velocity and guided wavelength of wave guide.
- c) Draw block diagram of duplexer and State its function.
- d) Write wave propagation phenomenon in rectangular waveguide.

Q2. Attempt any TWO

(2x4=8marks)

- a) Compare Rectangular waveguide and Circular waveguide on the basis of i) Definition ii) Construction iii) Field pattern iv) Application.
- b) Draw reflex klystron amplifier. Describe it's working.
- c) State the principle of Doppler Effect.

Q3. Attempt any TWO

(2x4=8marks)

- a) Draw construction of Gunn diode. Describe its operating principle.
- b) Sketch the construction of circulator and isolator. State Two applications of each.
- C) Draw the block diagram of MTI Radar. State the function of each block.

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Q1. Attempt any Three

(3x3=9 Marks)

- a) Define the following terms of a Satellite.

Angle ii) Elevation angle iii) Footprint

i)Azimuth

- b) State the advantages of fiber optic communication (Any 4 points)
c) Draw the construction and state working principle of LASER.
d) Draw satellite subsystem with block diagram. Label it.

Q2. Attempt any TWO

(2x4=8 Marks)

- a) Define i) Acceptance angle ii) Critical angle
iii) Numerical Aperture iv) Snells law

- b) Draw block diagram of OTDR, Write fault finding procedure for fiber optic using it.
c) A step index fiber has a numerical aperture of 0.16, a core refractive index of 1.45 and Core diameter of 90mm. Calculate i) Acceptance angle ii) Refractive index of cladding.

Q3. Attempt any TWO

(2x4=8 Marks)

- a) Differentiate between single mode and multimode fiber. (Any 4 point)
b) List out different types of splicing techniques? Describe any one.
c) Draw the block diagram of fibre optic communication. State the function of each block.

Sample Question Paper

Course Name : Electronics Engineering group

Course Code : EJ/ET/EN/EX/DE/ED/EI

Semester : Sixth

Subject Title : Advanced Communication System

Marks : 100

17656

Time: 3 Hours

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. A) Attempt any THREE

12 Marks

- a) Define the terms w.r.t waveguide i) Phase velocity ii) Group Velocity
- b) Draw labeled sketch of TWT. Give applications. (Any 2)
- c) Write RADAR range equation and state the factor affecting maximum range of RADAR.
- d) Define following term w.r.t to satellite.
 - i) Azimuth angle ii) Elevation angle

Q1. (B) Attempt any ONE.

06 Marks

- a) With neat diagram describe propagation of microwave through rectangular waveguide. In which condition it becomes dominant mode?
- b) Sketch the construction of Tunnel diode and write its operation.

Q.2 Attempt any FOUR.

16 Marks

- a) Differentiate between waveguide and two wire transmission line.
- b) Justify magnetron as an oscillator.
- c) Write the operation for pulsed radar to detect the object.
- d) State reason for difference in uplink and down link frequency in satellite communication.
- e) Draw frequency spectrum for optical communication with band name and its range.
- f) State different types of fiber optic cable on the basis of i) modes ii) refractive index profile.

Q3. Attempt any FOUR.

16 Marks

- a) State the advantages of circular waveguide.(Any 4)
- b) With neat sketch, describe the operation of the GUNN diode.
- c) Describe A-scope, PPI Display method with its diagram.
- d) Define geostationary orbit and geostationary satellite.
- e) Differentiate satellite communication and fiber optic communication w.r.t
 - i) Frequency range ii) Electromagnetic interference iii) Application iv) Limitation

Q4. (A) Attempt any THREE.

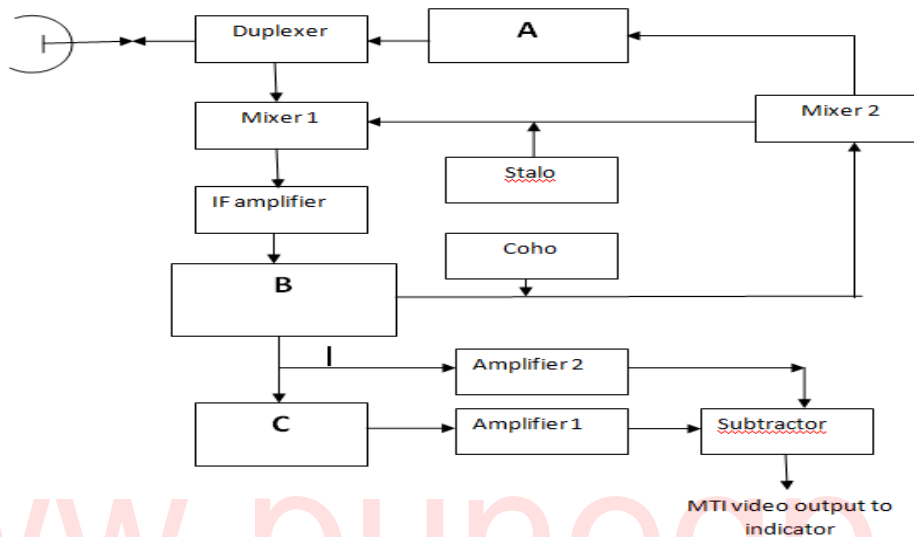
12 Marks

- a) Draw field pattern of circular waveguide.
- b) Draw the construction of PIN diode and describe with its working principle.
- c) Describe the concept of Doppler Effect.
- d) Illustrate how telemetry tracking and command system used in satellite communication.

Q4. (B) Attempt any ONE.

06 Marks

- a) With neat sketch draw block diagram of fiber optic communication system and list out detectors suitable for it.
- b) Identify the given diagram, label the block A, B, C and state their function.



Q5. Attempt any FOUR.

16 Marks

- a) Distinguish microwave circulator and isolator with following parameter.
 - i) Function ii) Construction iii) Application iv) Number of ports
- b) Show how reflex klystron worked as a amplifier.
- c) Draw schematic of LASER and describe it's working principle with transition process involved in LASER process.
- d) Illustrate block diagram of satellite subsystem.
- e) Calculate critical angle of incidence between two substances with different refractive indices $n_1=1.4$ and $n_2=1.36$
- f) When the optical power launched into an 8 km length of fiber is $120\mu w$ the mean optical power at the fiber output is $3\mu w$. Determine-i) The overall signal attenuation or loss in decibels through the fiber assuming there are no connector or splicer. ii) The signal attenuation per kilometer for the fibers.

Q6. Attempt any FOUR.

16 Marks

- a) Draw field pattern of TE₁₀ and TE₁₁ mode.
- b) Describe Scattering and dispersion losses in optical fiber.
- c) Draw the diagram of fusion splicing and V-Groove splicing technique.
- d) How power is generated in satellite? Describe how it is distributed to other subsystem of satellite.
- e) Distinguish LED & LASER on the basis of i) operating principle ii) Switching time iii) Power consumption iv) Spectral width