T.Y. Diploma : Sem. VI
[EJ/ET/EN/EX]

Advanced Communication System

Time: 3 Hrs.] Prelim Question Paper **[Marks : 100**

Instructions : (1) All questions are compulsory.
(2) Answer each next main question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

1. (a) Attempt any **THREE** questions. **[12]**
(i) State splicing technologies used for optical fiber? Explain Fusion splicing in detail?
(ii) Compare Between waveguide and Two wire transmission line.
(iii) Define the terms w.r.t. waveguide :
(1) Cut-off frequency (2) Cut-off wavelength
(iv) Define following terms w.r.t. satellite :
(1) Azimuth angle (2) Elevation angle

1. (b) Attempt any **ONE** questions. **[6]**
(i) Explain the working principle and construction of PIN diode? Write two applications?
(ii) Describe TE and TM modes in rectangular waveguide.

2. Attempt any **FOUR** questions. **[16]**
(a) List two advantages and two applications of circular waveguide?
(b) Describe, how bunching is formed in Magnetron-with neat diagram.
(c) List advantages and disadvantages of fibre optic cable as compare to conventional cable. (2 points each).
(d) Why do practical Klystron amplifiers generally have more than two cavities? How can broad band operation be achieved in multicavity Klystrons.
(e) Write the operation of pulsed radar to detect the object.
(f) Compare SMSI and MMGI fibers based on
(i) Mode (ii) Refractive index profile
(iii) Data rate (iv) Application

3. Attempt any **FOUR** questions. **[16]**
(a) Explain Antenna scanning method's used in radar.
(b) Give characteristics and classification of fiber.
(c) Describe working principle of OTDR with its Block diagram?
(d) Explain advantages of satellite communication (4 points).
(e) With neat diagram, illustrate the working of the Gunn diode.

4. (a) Attempt any **THREE** questions. **[12]**
(i) Draw block diagram of MTI radar and explain its operation?
(ii) Calculate the cut off wavelength, guide wavelength, characteristic wave impedance of a wave guide whose internal diameter is 4 cm for a 12 GHz signal propagated in it in the TE_{111} mode.
(iii) Illustrate how telemetry tracking and command system used in satellite communication.
(iv) Describe a scope, PPI display method with its diagram.

(b) Attempt any **ONE** questions. **[6]**
(i) Explain horizontal, vertical, helical and spiral antenna scanning in radar system.
(ii) Draw the block diagram of fiber optics communication system and illustrate the function of each block.

5. Attempt any **FOUR** questions. **[16]**

(a) Explain the function of magic Tee in detail.
(b) Describe working of directional coupler with neat diagram.
(c) Differentiate between LED and LASER.
(d) With the aid of neat diagram, illustrate phase focussing effect in the cavity magnetron.
(e) Calculate critical angle of incidence between two material with different refractive indices $n_1 = 1.4$ and $n_2 = 1.36$. Also calculate numerical aperture and acceptance cone angle.

6. Attempt any **FOUR** questions. **[16]**

(a) Explain function of : (i) Circulator (ii) Isolator
(b) State advantage of fiber optic commination.
(c) Describe scattering and dispersion losses in optical fibre.
(d) Distinguish between splicing and connectors of fibre optic cable.
(e) How power is generated in satellite. Describe how it is distributed to other subsystem of satellite.

Paper Discussion Schedule for T.Y. Diploma Sem.VI

Date	Day	Timing	Centre
9 April 2017	Sunday	9 a.m. to 11 a.m.	Dadar, Nerul
9 April 2017	Sunday	12 p.m.to 2 p.m.	Thane

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