

**B. TECH. SEM -VI (E & TC ENGG.) (2014 COURSE) (CBCS)
: WINTER - 2017**

SUBJECT: MICROWAVE THEORY & ANTENNAS

Day: **Thursday**
Date: **23/11/2017**

W-2017-2248

Time: **10.00 AM TO 01.00 PM**
Max Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Use of non- programmable **CALCULATOR** is allowed.

Q.1 A lossless transmission line with $z_0 = 50 \Omega$ is 30m long and operates at 2MHZ. (10)
The line is terminated with a load of $Z_L = 60 + j40 \Omega$ if $u = 0.6c$ on the line find
a) reflection coefficient b) standing wave ratio c) input impedance

OR

Q.2 Derive the voltage reflection concept for transmission line of length l , (10)
characterized by γ and z_0 , connected to load Z_L .

Q.3 Define the following with respect to waveguides. (10)
b) Dominant mode b) Cut off frequency c) Hybrid mode d) TM_{21}
e) TE_{32}

OR

Q.4 Differentiate between TE and TM mode with their respective diagrams. (10)

Q.5 Differentiate between active and passive microwave devices with examples. (10)

OR

Q.6 Explain the following with respect to couplers. (10)
b) Coupling factor b) directivity c) isolation d) two- hole directional
coupler e) s matrix of coupler

Q.7 Differentiate between near field and far field radiation with equations. (10)

OR

Q.8 Derive the radar range equation? (10)

Q.9 Explain the following with equations. (10)

- a) Broadside array b) End fire array c) Co-linear array

OR

Q.10 Explain and derive the equations of log periodic antenna. (10)

Q.11 Explain the Huygens's principle with diagram and equations. (10)

OR

Q.12 What do you mean by smart antennas? List the applications. (10)

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