

Government College of Engineering, Aurangabad  
(An Autonomous Institute of Government of Maharashtra)

**B.E. (E&TC) (old) Examination**

End Semester Examination Nov 2016

**ET-401 Microwave Engineering**

11 NOV 2016

*Time: Three Hours*

*Date: - - 2016*

*Max. Marks: 60*

*“Verify the course code and check whether you have got the correct question paper”*

**N.B.:-**

1. All Questions are **compulsory**.
2. Figures at right indicate full marks.
3. Solve all sub questions in sequence only.

- Q.1 a) What is reflection coefficient  $\rho_l$  of a transmission line? Derive the relationship between  $\rho_l$  & characteristic impedance  $Z_0$ . 06
- b) Write a brief note on: Smith Chart 06
- Q.2 Attempt (any two) 12
- a) What are different methods to couple waveguide & coaxial cable?
- b) Compare TE & TM modes in rectangular waveguide.
- c) Discuss phase shifter.
- Q.3 Attempt any two 12
- a) Explain the working principle of circulator & write its application.
- b) Derive scattering matrix for H-plane Tee & hence write its working.
- c) Explain in brief directional coupler & its application.
- Q.4 Explain the working of the following devices with applications (any two) 12
- a) Gunn diode
- b) PIN diode
- c) TWT
- Q.5 Write short note on (any two) 12
- a) Parabolic reflector & end fire array.
- b) Micro strip lines.
- c) Measurement of VSWR

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