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IV/IV B.Tech (Regular) DEGREE EXAMINATION**OCTOBER, 2016****Electronics and Communication Engineering****Seventh Semester****Microwave Engineering****Time:** Three Hours**Maximum : 60 Marks***Answer Question No.1 compulsorily.**(1X12 = 12 Marks)**Answer ONE question from each unit.**(4X12=48 Marks)***1. Answer all questions***(12X1=12 Marks)*

- a) What are the applications of magic tee?
- b) Define Faraday rotation.
- c) State the Unitary property of S-Matrix.
- d) Define Gunn Effect.
- e) Compare IMPATT and TRAPATT diodes.
- f) What are the applications of PIN diode?
- g) What are the limitations of conventional tubes at microwave frequencies?
- h) Define reentrant cavity.
- i) What is mode jumping in magnetron tube?
- j) Name the two methods to measure the attenuation.
- k) Write differences between low frequency measurements and the microwave frequency measurement.
- l) Define VSWR.

UNIT – I

- 2.a What are cavity resonators? Derive the equations for resonant frequencies for a rectangular and circular cavity resonator. (6M)
- 2.b How magic is associated with Magic Tee? Draw a neat sketch of Magic Tee and derive the S-Matrix. (6M)

(OR)

- 3.a Explain the working of a two-hole directional coupler and write its parameters .Calculate the coupled and isolated port powers if the incident power is 100W, coupling factor and directivity are 25dB and 40dB respectively (8M)
- 3.b List differences between microwave circulator and isolator. (4M)

UNIT – II

- 4.a Explain the “Tunneling action” of a tunnel diode along with the V-I characteristics (6M)
- 4.b Discuss Ridley-Watkins-Hilsum theory (6M)

(OR)

- 5.a Explain the construction and principle of operation of a TRAPATT diode. (6M)
- 5.b Differentiate between Avalanche transit time devices and transferred electron devices (6M)

UNIT – III

- 6.a Describe the mechanism of velocity modulation in a two cavity klystron and hence obtain an expression for the bunched beam current. (6M)
- 6.b What are the differences between TWT and klystron amplifier (6M)

(OR)

- 7.a With a neat diagram explain the operation of a reflex klystron. Show that the theoretical efficiency of reflex klystron is 22.7%. (6M)
- 7.b What is strapping in magnetron? How is the same effect obtained without strapping? (6M)

UNIT – IV

- 8.a Explain any two methods of measuring impedance of a terminating load in a microwave system. (6M)
- 8.b Describe how the power of a microwave generator is measured using Bolometer technique (6M)

(OR)

- 9.a Explain bench setup used for measurement of VSWR. (6M)
- 9.b With an experimental set up, briefly explain how scattering coefficients can be measured. (6M)