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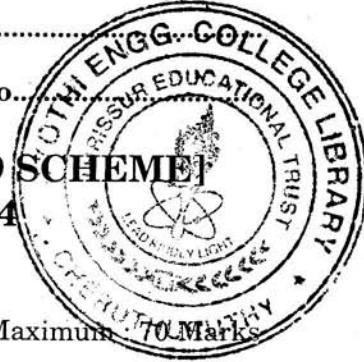
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**SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME]
DEGREE EXAMINATION, NOVEMBER 2014**

EC/PTEC 09 702 – MICROWAVE ENGINEERING

Time : Three Hours

Maximum 70 Marks



Part A

Answer all questions.

1. Mention the characteristic features of microwaves.
2. What is velocity modulation ?
3. State the differences between TWT and BWO.
4. How are transferred electron devices (TEDs) different from microwave transistors ?
5. What is lithography? Mention the various types of it.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. What is a scattering matrix? Mention the properties of scattering matrices.
7. Discuss the limitations of conventional tubes at microwave frequencies.
8. Write short notes on millimetre wave tubes.
9. Derive Manley-Rowe Power relation in parametric amplifier.
10. Explain the working principle of Schottky barrier diode.
11. Discuss the different types of losses in microstrip lines.

(4 × 5 = 20 marks)

Part C

Answer all questions.

12. (a) What is a directional coupler? Explain the working of a directional coupler and derive s-matrix for the same.

Or

(b) Write short notes on:

- (i) Magic Tee.
- (ii) Microwave circulators.

Turn over

13. (a) Explain the operation of reflex klystron oscillator with an applegate diagram. Derive its power output, efficiency and electronic admittance.

Or

- (b) Describe the working principles of cylindrical and linear magnetron with suitable circuits.

14. (a) What is a Gunn effect? Explain the working principle of Gunn diode and its operation as an oscillator.

Or

- (b) Write short notes on :

(i) IMPATT diode

(ii) PIN diode.

15. (a) (i) Explain the microwave power measurement techniques.
(ii) Compare stripline and slotline with neat sketches.

Or

- (b) (i) Compare hybrid and monolithic MICs.
(ii) Discuss in detail about VSWR measurement.

(6 + 4 = 10 marks)

[4 × 10 = 40 marks]