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Question Paper Code : 42465

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Seventh Semester

Electronics and Communication Engineering
EC 2403 – RF AND MICROWAVE ENGINEERING
(Regulations 2008)

(Common to PTEC 2403 – RF and Microwave Engineering for B.E. (Part-Time)
Sixth Semester – Electronics and Communication Engineering –
Regulations 2009)

Time : Three Hours

Maximum : 100 Marks

Smith Chart is to be provided.
Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is reciprocal device ?
2. List the limitations of low frequency parameters at microwave frequencies.
3. Define unconditional stability.
4. What are the functions of input and output impedance matching network ?
5. Why magic tee is known as E-H tee ?
6. What are the basic types of directional coupler ?
7. What is transferred electron effect ?
8. What are the elements that exhibit Gunn Effect ?
9. Why magnetron is known as cross field device ?
10. Write down the sensors used for microwave power measurements.

PART – B

(5×16=80 Marks)

11. a) State and explain the properties of S parameters. Derive the ABCD matrix for a series impedance and shunt admittance. (16)
- (OR)
- b) Derive the S-matrix for a two port network. Derive the ABCD matrix for a transformer with N : 1 turns. (16)



12. a) A microwave amplifier is characterized by its S parameters. Derive equations for power gain, available gain and transducer gain. (16)

(OR)

- b) A microwave transistor has the following S parameters at 10 GHz, with a 50Ω reference impedance $S_{11} = 0.45 \angle 150^\circ$, $S_{12} = 0.01 \angle -10^\circ$, $S_{21} = 2.05 \angle 10^\circ$, $S_{22} = 0.40 \angle -150^\circ$, The source impedance is 20Ω and load impedance is 30Ω , compute the power gain, available gain, transducer power gain. (16)

13. a) Derive the S matrix for E-plane tee and H-plane tee. (16)

(OR)

- b) Derive the S matrix for directional coupler. (16)

14. a) i) Describe the modes of operation of a Gunn diode. (10)

- ii) Compare tunnel diode and normal PN diode. (6)

(OR)

- b) Explain the operation of a two cavity klystron amplifier and compare it with travelling wave tube. (16)

15. a) Explain the methods to measure the impedance at microwave frequency. (16)

(OR)

- b) i) Explain double minimum method of measuring VSWR. (8)

- ii) Explain a method for high power measurement. (8)