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B.E./B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2013

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

SIXTH SEMESTER

EC 385 – RF AND MICROWAVE ENGINEERING

(REGULATIONS 2004)

57

Duration: 3 Hours

Max.marks: 100

Answer ALL questions

PART-A

(10x2=20 Marks)

1. What is scattering matrix?
2. Write the merits of FMCW radar.
3. Define directivity of Directional-coupler.
4. What are the types of circulators.
5. State Gunn effect.
6. Distinguish between ATDs and TEDs.
7. What are M-Type tubes?
8. Define velocity modulation.
9. List the three scales on VSWR meter.
10. List any two sensors used to measure the power.

PART-B

(5x16=80 Marks)

11. (i) Derive the scattering matrix formulation for n-port network. (8)  
(ii) What do you mean by symmetry of scattering matrix? Explain. (8)
12. (a) (i) Discuss briefly on Faraday rotation isolator. (8)  
(ii) Prove that it is impossible to construct a perfectly matched, lossless, reciprocal three port junction. (8)
- OR
12. (b) (i) Distinguish between coupling probe and coupling loop. (8)  
(ii) With a neat diagram explain about fixed type attenuators. (8)
13. (a) Enumerate with appropriate equations the power frequency limitations of BJTs at high frequency. (16)
- OR
13. (b) (i) Give the principle of parametric amplifier. (4)  
(ii) Derive Manley-Rowe power relations and explain the parametric up converter. (12)
14. (a) Draw a neat sketch showing the constructional features of a cavity magnetron and derive an expression for cut off magnetic field for a cylindrical magnetron. (16)
- OR
14. (b) Describe with neat sketch the constructional details and principle of operation of a Reflex Klystron tube. With the help of apple-gate diagram illustrate the phenomenon of bunching. (16)
15. (a) (i) Explain the measurement of load impedance by slotted line method. (8)  
(ii) Describe with neat diagram and mathematical formulation the measurement of dielectric constant of a solid using rectangular waveguide. (8)
- OR
15. (b) (i) Explain the measurement of cavity 'Q' by slotted line method. (8)  
(ii) Describe in detail with block diagram the measurement of VSWR through return loss measurement. (8)