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**Question Paper Code : 73466**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh Semester

Electronics and Communication Engineering

EC 2403/EC 73/10144 EC 703 – RF AND MICROWAVE ENGINEERING

(Regulations 2008/2010)

(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. Why Z, Y and H parameters cannot be used for microwave range?
2. Write the properties for S-matrix for a lossless network.
3. What is meant by impedance matching? What are the considerations in selecting the matching network?
4. Define stability.
5. Define dominant mode.
6. What is hybrid ring?
7. Write the operation of LSA mode in Gunn diode.
8. Draw the voltage and current waveform for TRAPATT diode.
9. What are the advantages of multi cavity klystron amplifier?
10. What is slow wave structure? Name any three with its respective diagrams

PART B — (5 × 16 = 80 marks)

11. (a) (i) Obtain the S-parameters of transformer with turns ratio  $N : 1$ . (8)  
(ii) Derive the S parameters of N-port network. (8)

Or

- (b) (i) Derive the S-parameters of two port network from ABCD parameter. (8)  
(ii) State and prove the properties of S matrix. (8)
12. (a) (i) Write brief note on : (8)  
(1) Power gain  
(2) Transducer gain  
(3) Available gain  
(4) Noise Figure.  
(ii) Discuss the smith chart approach to design L and T matching network. (8)

Or

- (b) (i) Draw output stability circle and input stability circle. What is the condition for Unconditionally stable and derive the same? (8)  
(ii) Explain the microstripline matching network in detail. (8)
13. (a) (i) Write short note on : (8)  
(1) Gyrator  
(2) Cylindrical cavity resonator  
(3) Variable short circuit Attenuator.  
(ii) Derive the S-matrix of multi hole directional coupler when the coupling factor is 3dB. (8)

Or

- (b) (i) Explain the properties of Magic tee and derive its S-matrix. (8)  
(ii) What is Faraday rotation? Explain the working of a ferrite circulator with neat sketch. (8)

14. (a) (i) Write short note on power frequency limitation in microwave BJT. (2)
- (ii) Explain the working principle of tunnel diode. (7)
- (iii) Derive the expression for power output and efficiency for IMPATT. (7)

Or

- (b) What is transferred electron device? Explain the working of Gunn diode based on RWH theory. Discuss its various modes of operation. (16)
15. (a) (i) Explain the bunching process in two cavity Klystron amplifier in detail. (4)
- Explain the electronic admittance diagram of Reflex Klystron with neat sketch. (4)
- (ii) What is VSWR meter? How is it different from voltmeter? Explain its features. (8)

Or

- (b) What is Magnetron? Explain the working principle of Cylindrical Magnetron in detail. Write short note on 'Cyclotron angular frequency' in Magnetron. Explain the working principle of Carcinotron. (16)