KADI SARVA VISHWAVIDYALAYA
B.E. SEMESTER VII EXAMINATION NOVEMBER – 2016

SUBJECT CODE: EC–703   SUBJECT NAME: MICROWAVE ENGINEERING

DATE: 12/11/2016   TIME: 10:30 TO 1:30   TOTAL MARKS: 70

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section – 1

Que. 1   (All Compulsory.)

(A)   Explain different Microwave frequency Regions and Bands.   (5)

(B)   What are microwaves? Explain advantages and applications of microwave.   (5)

(C)   Define Standing wave and derive equation of the voltage standing wave. Also find equations for the minimum and maximum amplitude and distance between any two successive maxima or minima. Draw the standing wave pattern for lossy and lossless line.   (5)

OR

(C)   A transmission line has the following parameters: R=2Ω/m G=0.5mmho/m L=8nH/m C=0.23pF f=1GHz Calculate the characteristic Impedance and the propagation constant.   (5)

Que. 2

(A)   Draw equivalent circuit of transmission line and derive basic equations for voltage and current on transmission line.   (5)

(B)   Write short note on: Micro strip lines.   (5)

OR

(A)   What do you mean by stub? Explain impedance matching by use of stub with necessary circuit, waveforms and derivation.   (5)

(B)   Write properties of smith chart and explain its application with example.   (5)

Que. 3

(A)   Draw and explain working of a Magic Tee with neat sketch. Write its applications.   (5)

(B)   Explain working of Circulators and isolators with neat sketch.   (5)

OR

(A)   Draw and explain waveguide bend, corners and twist in detail with their applications.   (5)

(B)   What is scattering matrix? Explain the significance of S - matrix.   (5)

1

Section – 2

Que. 4 **(All Compulsory.)**

    (A)   Explain Working of reflex klystron.   (5)

    (B)   What is velocity modulation? Explain with diagram how velocity modulation is utilized in Klystron amplifier?   (5)

    (C)   Explain working of TWT with necessary diagram and waveforms.   (5)

OR

    (C)   Write a note on Magnetron.   (5)

Que. 5 **Answer the following questions.**

    (A)   Explain working of tunnel diode and give its applications.   (5)

    (B)   Explain GUNN effect. Describe the construction of GUNN diode and mention performance, characteristics and applications.   (5)

OR

    (A)   Explain working of PIN diode with necessary circuit and waveforms. Discuss applications of it.   (5)

    (B)   Explain IMPATT Diode with its construction, working and application.   (5)

Que. 6 **Answer the following questions.**

    (A)   What is the working principle of Radar? Discuss applications of Radar.   (5)

    (B)   Derive the equations to determine the maximum range of radar and discuss the factors influencing maximum range of radar.   (5)

OR

    (A)   Draw and explain block diagram of MTI radar   (5)

    (B)   Write short notes on: Working of CW Doppler radar   (5)

ALL THE BEST

2

KADI SARVA VISHWAVIDHYALAYA
BE 7th Semester Electronics & Communication Dept.
Examination –November 2015

Sub code: EC- 703   Sub Name: Microwave Engineering
Date: 27/11/2015   Time: 10:30am to 01:30pm   Total Marks: 70

Instructions:
1. Answer Each Section in Separate Answer sheet.
2. Use of Scientific Calculator is permitted. .
3. All questions are separate
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of supplementary for rough work.

SECTION I

Q.1 (a) Explain advantages of microwave and its applications.   [05]
   (b) Explain in detail applications of Magic Tee.   [05]
   (c) Draw equivalent circuit of transmission line and derive basic equations for   [05]
        voltage and current on transmission line.

OR

   (c) Define Standing wave and derive equation of the voltage standing wave. Also   [05]
        find equations for the minimum and maximum amplitude and distance
        between any two successive maxima or minima.

Q.2 (a) Explain with diagram waveguide band, and twist with their applications.   [05]
   (b) A lossless transmission line with characteristic impedance of 300 ohm is fed   [05]
        by a generator with impedance 100 ohm. The line is 100 m long and is
        terminated by a resistive load of 200 ohm. Calculate the load reflection
        coefficient, VSWR, the transmission loss and the return loss

OR

Q.2 (a) What is micro strip line? Derive expression of characteristics impedance of   [05]
        micro strip line.
   (b) A 75Ω transmission line is terminated in a load of (150 + j 225) Ω Design a   [05]
        suitable stub line to match the load to the line. The operating frequency is 500
        Mhz. Use Smith chart for solving the problem.

Q-3 (a) Explain mathematical analysis of rectangular waveguide.   [05]
   (b) Write a note on Directional coupler and its applications with all necessary   [05]
        detail.

OR

Q-3 (a) Derive Distributed parameters, characteristic impedance and attenuation losses   [05]
        for parallel strip lines.
   (b) Explain the construction of four port circulator and derive its S-matrix.   [05]

SECTION II

Q.4 **(a)** Describe the problems associated with conventional tubes at UHF and Microwave? **[05]**

(b) Explain working principles of Tunnel Diodes with Energy-band Diagrams. **[05]**

(c) Explain the construction and working of Magnetron tube. List out its applications. **[05]**

OR

(c) Explain the operation, construction and application of the IMPATT diode. **[05]**

Q.5 **(a)** Explain the basic principle of Parametric amplifier. Explain degenerate and non degenerate mode. **[05]**

(b) Explain reflex klystron and it's working with all necessary detail. **[05]**

OR

Q.5 **(a)** Explain avalanche transit time effect; also Explain working, construction of TRAPATT diode. **[05]**

(b) Explain working of Traveling-wave tube with all necessary details. **[05]**

Q-6 **(a)** Derive the equation of the range of Radar. Discuss the parameters which affect the range of Radar. **[05]**

(b) Explain the principle of MTI radar with block diagram. **[05]**

OR

Q-6(a) Draw block diagram of pulse radar and explain each block. **[05]**

(b) Explain Doppler effect and continuous wave Doppler radar along with necessary diagrams. **[05]**

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