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(July)

ELECTRONICS

(Honours)

(**Antenna, Transmission Line,
Waveguides, Control System**)

[ELEC-601 (T)]

Marks : 75

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer **three** questions, taking **one** from each Unit

UNIT—I

1. (a) Write a short note on oscillating electric dipole with necessary diagram.
- (b) What is current element?
- (c) Draw neat diagrams of microwave dish antenna and parabolic reflector.

- (d) Explain briefly the working of a microwave dish antenna.
- (e) Discuss briefly radiation resistance due to a Hertzian dipole. 6+3+4+6+6=25

2. (a) Discuss the application of Thevenin's theorem in antenna analysis.
- (b) Explain in detail the working principle of rhombic antenna.
- (c) Explain with a neat diagram the construction and power pattern of a Yagi antenna.
- (d) Write a short note on effective length of an antenna. 5+7+8+5=25

UNIT—II

3. (a) Draw an equivalent circuit of a transmission line and explain how these distributed parameters effect the transmission of radio frequencies.
- (b) Deduce the expression for voltage and current at a distance from the sending end in a transmission line.
- (c) Define characteristic impedance and propagation constant.
- (d) What are the conditions for no distortion transmission? 7+8+5+5=25

(3)

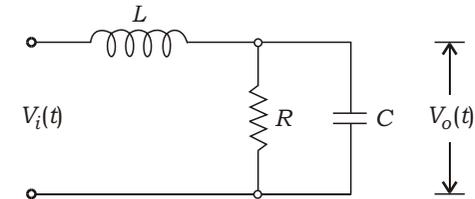
4. (a) Discuss standing wave ratio and reflection coefficient of a transmission line.
- (b) Explain the behaviour of short-circuited and open-circuited lossless line with respect to length.
- (c) Find the input impedance of a line of length l terminated with a load Z_R . What happens when the line is shorted?
- (d) Briefly describe a rectangular waveguide (qualitatively). 5+8+8+4=25

UNIT—III

5. (a) Mention some advantages of automatic control system.
- (b) What are the differences between open-loop and close-loop control systems?
- (c) Discuss in brief PD control action.
- (d) Discuss briefly the various building blocks of a control system. 5+5+8+7=25

(4)

6. (a) What is a transfer function?
- (b) Determine transfer function of the following L - C - R circuit shown in figure below :



- (c) Define position error constant, velocity error constant and acceleration error constant.
- (d) Find $\frac{C(s)}{R(s)}$ for a second-order system.
- (e) Discuss the response for the second-order system for (i) 0, (ii) 1 and (iii) 1 2+5+5+5+8=25

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