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**Question Paper Code: 35404**

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Third Semester

Electronics and Communication Engineering

01UEC504- TRANSMISSION LINES AND WAVEGUIDES

(Regulation 2013)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

**(Answer any ten of the following questions)**

1. List the properties about symmetrical networks.
2. Draw the frequency response characteristics of constant K low pass filter.
3. Discover the applications of transmissions lines.
4. State distortion less line and mention the condition for a distortionless line.
5. Justify the reason for preferring a short circuited stub when compared to an open circuited stub.
6. Define SWR.
7. Write Maxwell's equations.
8. Distinguish between TE and TM waves.
9. Mention the application of rectangular waveguide.
10. Define resonant cavities.
11. Draw the frequency response characteristics of constant K low pass filter.
12. List the advantages of  $m$  derived filter.
13. List any two advantages of lumped loading.
14. Define deflection coefficient.

15. What is need for smith chart?

PART – B (3 x 10= 30 Marks)

**(Answer any three of the following questions)**

16. Derive the characteristic impedance and propagation constant of a symmetrical T-Network. (10)
17. Derive the general transmission line equation for voltage and current at any point on a line. (10)
18. A transmission line has a characteristic impedance of  $300 \Omega$  and terminated in a load  $Z_L = 150 + j150 \Omega$ . Find the following using smith chart.
- (1) VSWR.
  - (2) Input impedance at a distance  $0.1\lambda$  from the load.
  - (3) Input admittance from  $0.1 \lambda$
  - (4) Position of first voltage minimum and maximum from the load. (10)
19. Derive the field expression of TM waves guided by a parallel conducting plane. (10)
20. A rectangular air-filled waveguide with dimension  $0.9 \text{ inch} \times 0.4 \text{ inch}$  cross section and  $12 \text{ inch}$  length is operated at  $9.2 \text{ GHz}$  with a dominant mode. Find cut-off frequency, guide wave-length, phase velocity, characteristics impedance and the loss. (10)