

- (b) (i) Discuss the principle of double stub matching with neat diagram and expressions. (8)
- (ii) A 300 ohm transmission line is connected to a load impedance of $(450 - j 600) \Omega$ at 10 MHz. Find the position and length of a short circuited stub required to match the line using Smith chart. (8)
14. (a) Discuss the transmission of TM waves between parallel perfectly conducting planes with necessary expressions for the field components. Discuss briefly the manner how the wave travels and phase and group velocities between the two parallel planes. (16)

Or

- (b) (i) Discuss briefly the attenuation of TE and TM waves between parallel planes. (10)
- (ii) Give a brief note on the transmission of TEM waves between parallel planes. (6)
15. (a) (i) Describe the propagation of TE waves in a rectangular waveguide with necessary expressions for the field components. (12)
- (ii) An air filled rectangular waveguide of dimensions $a = 4.5$ cm and $b = 3$ cm operates in the TM_{11} mode. Find the cut off wavelength and characteristic wave impedance at a frequency of 9 GHz. (4)

Or

- (b) (i) Explain briefly the propagation of TM waves in a circular waveguide with necessary expressions for the field components. (10)
- (ii) Give a brief note on excitation of modes in rectangular waveguides. (6)