

The Technical University of Mombasa
A Centre of Excellence
Department of Electrical & Electronic Engineering

EEE2314 : TRANSMISSION LINES

CAT II

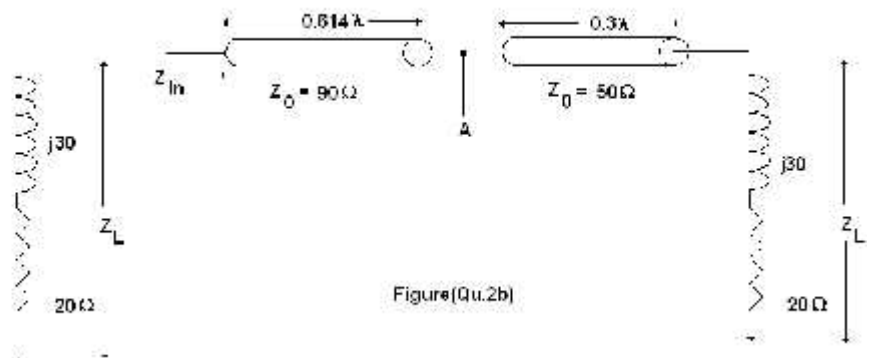
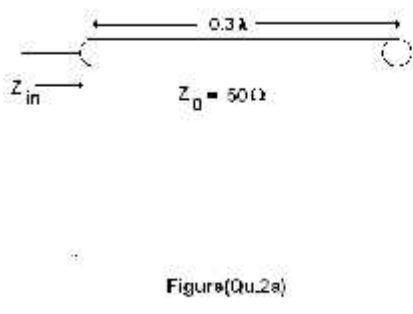
APRIL 19TH 2014

TIME : 2 HOURS

ATTEMPT ALL QUESTIONS

1. (a) A lossless transmission line of characteristic impedance 75Ω is terminated in a load of $75 + j150 \Omega$. If the line is 1m long and the signal frequency is 1 GHz , find the:
- (i) Reflection coefficient at the load
 - (ii) Normalized load admittance
 - (iii) VSWR
 - (iv) Input impedance
- (20 Marks)

2. (a) Determine the input impedance of the transmission line in Figure (Qu.2a). (6 marks)



- (b) Determine the input impedance of the transmission line in Figure (Qu.2b). (Hint: consider the second transmission line first, de-normalize the load at point A obtaining the new load for the first transmission line and normalize again using the characteristic impedance of the first line.) (14 marks)

3. (a) The load impedance $Z_L = 20 + j10 \Omega$ is to be matched to a 50Ω line by a $\lambda/4$ length of loss free line. Calculate the position and impedance of the matching section (6 marks)
- (b) Using any analytical means at your disposal confirm that the $\lambda/4$ section of transmission line actually matches the transmission line to the load. (4 marks)
3. (c) Match a line with a characteristic impedance of 72Ω to a load of $120 - j100 \Omega$ using a parallel short-circuited stub. (10 Marks)