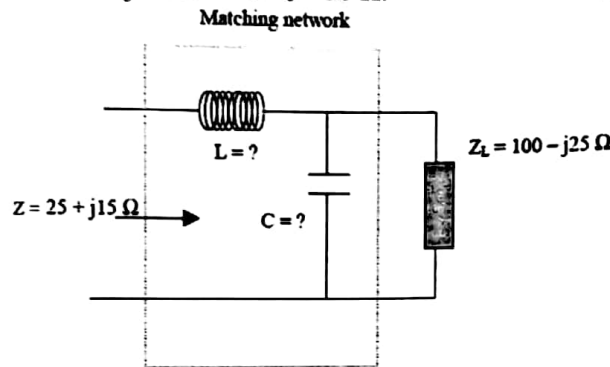


1. Question No. 1 is compulsory.
2. Out of remaining questions, attempt any three questions.
3. Assume suitable additional data if required.
4. Figures in brackets on the right hand side indicate full marks.

- Q.1. (A) What is meant by RADAR range? (05)
 (B) Discuss the characteristics of microwaves. (05)
 (C) Given the circuit shown in Fig. 1(C), design a lumped element matching network at 60 MHz that would transform Load impedance $Z_L = 100 - j25 \Omega$ into an input impedance of $Z = 25 + j15 \Omega$. Take $Z_0 = 50 \Omega$. (10)



- Q.2. (A) With a neat functional diagram explain the working principle of Cylindrical Magnetron. (10)
 (B) Write a short note on circular waveguide. (10)
- Q.3. (A) Explain working of TRAPATT. (10)
 (B) Radar operating at 1.5 GHz uses a peak pulse power of 2.5 MW and has a range of 100 nmi for objects whose radar cross section is 1 m^2 . If the minimum receivable power of the receiver is 2×10^{-13} Watt, what is the smallest diameter of the antenna reflector could have assuming it to be a full paraboloid with $\eta = 0.65$. (10)
- Q.4. (A) Explain any one bio-medical application using microwave. (10)
 (B) Match a load impedance $Z_L = 60 - j80$ to a 50Ω line using a double stub tuner. The stubs are open circuited and are spaced $\lambda/8$ apart. The match frequency is 2 GHz. (10)
- Q.5. (A) With block diagram explain the MTI radar system. Give its limitations. (10)
 (B) Explain Doppler Shift and its role in pulsed and CW RADAR. (10)
- Q.6. Write a short note on following: (05)
 (A) Phase shifters (05)
 (B) Reflex Klystron (05)
 (C) Gunn diode (05)
 (D) Clutter (05)
