

Q.P. Code : 788802

(3 Hours)

Total Marks : 80

- Note : 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.

1. a) What is meant by RADAR range? 5
- b) Explain the working of Hybrid ring. 5
- c) Explain travelling wave tube as an amplifier. 5
- d) Explain working of IMPATT. 5
2. a) Match a load impedance  $Z_L = 60 - j80$  to a  $50 \Omega$  line using a double stub tuner. The stubs are open circuited and are spaced  $\lambda/8$  apart. The match frequency is 2 GHz. 10
- b) With a neat functional diagram explain the working principle of Cylindrical Magnetron. 10
3. a) Discuss the various frequency bands and characteristics of microwaves. 10
- b) Explain Doppler Shift and its role in pulsed and CW RADAR. 10
4. a) Explain instrument landing system for aircraft navigation. 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  $1 \text{ m}^2$ . If the minimum receivable power of the receiver is  $2 \times 10^{-13}$  Watt, what is the smallest diameter of the antenna reflector could have assuming it to be a full paraboloid with  $\eta = 0.65$ . 10
5. a) State various modes of Gunn diode and explain any one of them in detail. 10
- b) With block diagram explain the MTI radar system. Give its limitations. 10
6. a) Give the working principle difference between Two Cavity Klystron and Reflex Klystron. 10
- b) Write a short note on rectangular waveguide. 10

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