BE/Sem VII/EITL/CBGS/Nov2016/Microwave & Radar Engg.
15-12-2016

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 ZL=60-j80 to a 50 Ω line using a double stub tuner. The stubs are open circuited and are spaced λ/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 m^2 If the minimum receivable power of the receiver is $2x10^{-13}$ Watt, what is the smallest diameter of the antenna reflector could have assuming it to be a full paraboloid with η=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**
