Microwave & Radar Engg.
(EC-302, Dec-2007)

Note: Section A is compulsory. Attempt any four questions from Section-B and any two from Section-C.

Section-A

1. a) List the limitations of vacuum tubes.
   b) What is Gyrator?
   c) What is the need of slow wave structure in TWT?
   d) What is matched termination?
   e) What are the applications of BWO?
   f) An IMPATT diode has a pulsed operation voltage of 100V and a pulsed operating current of 0.9A. The efficiency is about 10%. Calculate (i) the output power and (ii) duty cycle, if the pulse width is 0.01ns and the frequency is 16GHz.
   g) What is multiple time around echoes?
   h) What is Radomes?
   i) How one can distinguish a stationary target and a moving target?
   j) Mention advantages and disadvantages of phased array radar?

Section-B

2. How does magnetron work as an oscillator? Discuss.
3. Discuss the applications of PIN diode.
4. Derive the equation given below for directional coupler & then give its S-matrix
   $p^2 + q^2 = 1$.
5. Draw the block diagram for measurement of Doppler direction using synchronous motor and discuss how it indicates the direction of the target.
6. Discuss the radar frequencies & its applications.

Section-C

7. Discuss the methods for measurement of SWR.
8. What is angle tracking system, discuss its various techniques.
9. Write short notes on:
   (a) Isolator & Circulator
   (b) TRAPATT diode