Scheme – I

Sample Question Paper

Program Name : **Diploma in Digital Electronics /Electronics Engineering Programme Group**

Program Code : **DE/EJ/ET/EN/EX/EQ**

Semester : **Fifth**

22535

Course Title : **Microwave and RADAR**

Marks : **70** **Time: 3 Hrs.**

Instructions:

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following. **10 Marks**

(a) State the frequency range for following bands :

i) C Band ii) X Band iii) K Band iv) Ku Band

(b) State the advantages of wave guide over transmission line

(c) State the name of Tee Joint used as Duplexer and mixer

(d) Draw neat sketch of Tapper and Twist

(e) List applications of IMPATT diode

(f) List the two advantages and two disadvantages of CW RADAR.

(g) Give the factors that affect the RADAR range .

Q.2) Attempt any THREE of the following. **12 Marks**

(a) Compare rectangular waveguide and circular waveguide on the basis of : i) Definition ii) Construction iii) Disadvantage iv) Applications.

(b) Explain the working principle of isolator with neat sketch and state it's two applications

(c) Draw equivalent circuit and VI characteristics of Tunnel diode.

(d) Define a RADAR Beacon. Explain its operation. Give typical usage.

Q.3) Attempt any THREE of the following. **12 Marks**

(a) Sketch the field pattern of TE_{10} , TE_{11} Modes of rectangular wave guide

(b) Draw the block diagram and explain operation of CW Doppler RADAR.

(c) Classify different antenna patterns in Doppler Radar. Explain any one.

(d) Describe the working principle of TWT and state it's two application

Q.4) Attempt any THREE of the following. 12 Marks

(a) Describe the operating principle of PIN diode and state it's two applications

(b) Explain the working principle of Horn Antenna with neat sketch

(c) Describe the working principle of magnetron with the help of constructional diagram

(d) Distinguish between stationery target and moving target .Explain principle of MTI RADAR.

(e) Define a pulsed RADAR .Give the affects of transmitting a long pulse ? Explain all the stages of a pulsed RADAR.

Q.5) Attempt any TWO of the following. 12 Marks

(a) Determine cutoff wavelength for the dominant mode in rectangular waveguide of breadth 10 cm for 2.5 GHz signal propagates in this waveguide in the dominant mode calculate guide wavelength and group velocity

(b) Describe the working principle of directional coupler with neat sketch and state it's two applications

(c) Draw the construction of GUNN diode and describe the application of GUNN diode as an oscillator

Q.6) Attempt any TWO of the following. 12 Marks

(a) Describe the bunching process of Two cavity Klystron with help of Apple gate diagram and state it's two applications.

(b) Calculate the maximum range of a guided missile tracking RADAR operate at 5GHz with a 1 Mwatt peak power output. If the antenna diameter is 3m and the receiver has a bandwidth of 2MHz with 10 dB noise figure. The target cross section is $2m^2$.

(c) An MTI RADAR operates at 8 GHz with a prf of 3500 pps. Calculate the lowest three blind speeds of this RADAR.

Scheme – I

Sample Test Paper - I

Program Name : **Diploma in Digital Electronics /Electronics Engineering Programme Group**

Program Code : **DE/EJ/ET/EN/EX/EQ**

Semester : **Fifth**

22535

Course Title : **Microwave and RADAR**

Marks : **20** **Time: 1 Hour.**

Instructions:

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

(a) Define i) Cut off frequency ii) Cut off wavelength

(b) Draw the constructions of E plane

(c) List the applications of Microwave in various fields

(d) State the device used for measurement of incident power and SWR

(e) State the device used as power output tube in communication satellite

Q.2 Attempt any THREE. **12 Marks**

(a) Draw constructional diagram of reflex Klystron and state it's two applications

(b) Differentiate between wave guide & two transmission lines

(c) State two advantages & two applications of circular waveguide

(d) Draw neat sketch of Gyrator and describe it's working principle

Scheme – I

Sample Test Paper - II

Program Name : **Diploma in Digital Electronics /Electronics Engineering Programme Group**

Program Code : **DE/EJ/ET/EN/EX/EQ**

Semester : **Fifth**

22535

Course Title : **Microwave and RADAR**

Marks : **20** **Time: 1 Hour.**

Instructions:

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

(a) State 2 advantages and disadvantages of CW RADAR.

(b) Give the typical usage of RADAR Beacon.

(c) Show the use of Doppler effect to calculate the relative velocity.

(d) State the factors affecting maximum RADAR range.

(e) State the name of the transferred electron device used in fast combinational and sequential logic circuit

Q.2 Attempt any THREE. **12 Marks**

(a) Explain the working of IMPATT diode with the help of neat diagram and state it's two applications.

(b) List the different antenna scanning pattern in RADAR. Explain any one.

(c) Draw the block diagram of Pulsed RADAR explain it.

(d) Describe the working of Tunnel diode as an oscillator with the help of neat diagram