Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY
Winter Examination-2019

Subject Name: Microwave & Radar Engineering

Subject Code: 4TE07MRE1 Branch: B.Tech (EC)

Semester : 7 Date : 20/11/2019 Time : 10:30 To 01:30 Marks : 70

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Answer the following questions** **(14)**

a) Expression for input impedance of a transmission line in terms of load impedance and characteristic impedance is:

a) $Z_0 (Z_L+j Z_0 \tan \beta l)/ (Z_0+j Z_L \tan \beta l)$
b) $(Z_0+j Z_L \tan \beta l)/ (Z_L+j Z_0 \tan \beta l)$
c) $Z_0 (Z_L-j Z_0 \tan \beta l)/ (Z_0-j Z_L \tan \beta l)$
d) $(Z_0-j Z_L \tan \beta l)/ (Z_L-j Z_0 \tan \beta l)$

b) Input impedance of a transmission line can be represented in terms of this simple trigonometry function.
a) sine function
b) cosine function
c) cotangent function
d) tangent function

c) For a $\lambda/2$ transmission line, if the characteristic impedance of the line is 50 Ω and the terminated with a load of 100 Ω, then its input impedance is:
a) 100Ω
b) 50Ω
c) 88.86Ω

d) For a transmission line, if the reflection coefficient is 0.4, then the transmission coefficient is:
a) 0.4
b) 1.4
c) 0.8
d) 2.8

e) When a load Z_L is matched to a line, the value of standing wave ratio is:
a)1
b)0
c)infinity
d) insufficient data to calculate SWR_n

f) What Are The Uses Of Radar?
g) Are Radar Gauges Safe?
h) How Does The Frequency Of The Radar Affect The Measurement?
i) What is the frequency range of Ku Band?
j) List out the the types of Wave guide.
k) Define VSWR
l) What is micro wave engineering?
m) Write any two application of micro wave engineering
n) What is full form of RADAR

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**
(a) Explain Two wire transmission lines. Give voltage and current relationship for transmission line.
(b) Briefly discuss input impedance, reflection coefficient and standing waves

Q-3 **Attempt all questions** **(14)**
(a) Explain TE mode and TM mode for rectangular wave guide.
(b) What do you mean by circular wave guide? Explain TEM mode in circular wave guide.

Q-4 **Attempt all questions** **(14)**
(a) Briefly discuss microwave tube. Give the limitation of conventional tube at UHF.
(b) Briefly discuss multicity klystron and reflex klystron with necessary figure.

Q-5 **Attempt all questions** **(14)**
(a) Demonstrate characteristics and performance of varactor diode micro wave device.
(b) Explain parametric amplifier.

Q-6 **Attempt all questions** **(14)**
(a) Explain Magic Tee and directional coupler with figures.
(b) Discuss cavity resonators and Isolators micro wave components.

Q-7 **Attempt all questions** **(14)**
(a) Explain frequency, power and permeability measurements in microwave.
(b) Explain principle of RADAR with block diagram of RADAR

Q-8 **Attempt all questions** **(14)**
(a) Explain Doppler effect and CW RADAR
(b) Explain performance, operation and limitation of Moving target Indicator(MTI)