Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Microwave Communication: Electronics and Technology

Subject Code: 5SC04MCT1 **Branch: M.Sc. (Physics)**

Semester: 4 **Date: 26/04/2018** **Time: 10:30 To 01:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator and 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.

SECTION – I

Q-1 **Attempt the Following questions** **(07)**

a. What is MESFET?

b. What is Flange?

c. Write Full name of VSWR.

d. What is TE wave or H wave?

e. What is cut off frequency of a guide?

f. Define impedance.

g. What is free space?

Q-2 **Attempt all questions** **(14)**

(a) What is effect of transit time? Write the applications of Reflex Klystron. **4**

(b) What is TWT microwave device? What is the purpose of slow wave structures used in TWT amplifiers? **10**

OR

Q-2 **Attempt all questions** **(14)**

(a) What is negative resistance in Gunn diode? Describe the operation of GUNN diode. **7**

(b) Explain the principle and operation of IMPATT diode. How the microwave oscillation build up in Impatt diode? **7**

Q-3 **Attempt all questions** **(14)**

(a) What is a circular waveguide? Why circular waveguides are not preferred over rectangular waveguides? **7**

(b) What is the role of wavelength in transmission of line? Does the transmission line have any effect on the circuit? **7**

OR

Q-3 **(a)** Explain and state the transmission line equation. **7**

(b) Find the telegrapher's equation by using Kirchhoff's current law. **7**

SECTION – II

Q-4 **Attempt the Following questions** **(07)**

a. What is a dominant mode?

b. What is a TEM wave or principal wave?

c. What is attenuator?

d. What is symbol of tunnel diode?

e. Draw the symbol of PIN diode.

f. Explain critical frequency.

g. Write Full names of UHF and VHF. **1**

Q-5 **Attempt all questions** **(14)**

(a) The dimensions of the waveguide are 2.5 cm × 1 cm. The frequency is 8.6 GHz. Find (i) possible modes and (ii) cut – off frequency for TE waves. **7**

(b) What is magic tee or hybrid tee? Explain the operation of magic tree with suitable figure. **7**

OR

Q-5	**(a)**	Explain the special features of Reflector antenna and discuss on different types of feeds used in antenna with neat diagram.	**7**
	(b)	With a neat sketch, explain the construction and operation of Helical antenna	**7**

Q-6		**Attempt all questions**	**(14)**
	(a)	What is loop antenna? Explain the radiation parameters of small loop antenna.	**7**
	(b)	State and prove that increasing the directivity of an antenna increases its effective area is directly proportion.	**7**

OR

Q-6		**Attempt all Questions**	
	(a)	What is ionosphere propagation? Explain the mechanism of ionosphere propagation	**7**
	(b)	Define shy wave. How does the earth affect ground wave propagation?	**7**