

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.
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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 $2.5 \text{ cm} \times 1 \text{ cm}$. 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**

