

Enrollment No: _____

Exam Seat No: _____

C. U. SHAH UNIVERSITY

Summer Examination-2022

Subject Name : Microwave Communication: Electronics and Technology

Subject Code : 5SC04MCT1

Branch: M.Sc. (Physics)

Semester: 4

Date: 04/05/2022

Time: 11:00 To 02:00

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 (1 Mark *7=7) (07)**
- a. What is the full form of VHF?
 - b. Draw the symbol of a Schottky diode.
 - c. What do you understand by negative resistance?
 - d. What is the benefit of using equivalent circuits?
 - e. Define the term ‘flanges’.
 - f. Mention the full form of MESFET.
 - g. What is the role of an attenuator?
- Q-2 Attempt all questions (14)**
- a. Mention the details of a Varactor diode while highlighting its principle, construction and working. (07)
 - b. Write a note on Travelling Wave Tube. (07)
- OR**
- Q-2 Attempt all questions (14)**
- a. Explain in detail the working and characteristics of a tunnel diode. (07)
 - b. Mention the performance characteristics and applications of Cavity magnetron. (07)
- Q-3 Attempt all questions (14)**
- a. Elaborate on the role of wave guides by explaining the various modes of propagation. (06)
 - b. Derive the transmission line equation. (08)
- OR**
- Q-3 a. Explain the details of a Schottky diode. How is it different from a normal PN junction diode? (08)**
- b. Explain the impedance characteristics in terms of attenuation and phase constant. (06)**



SECTION – II

- Q-4 Attempt the Following questions (1 Mark *7=7) (07)**
- a. Define the effective length of an antenna.
 - b. Give the full form of VSWR.
 - c. Mention the range of Microwave region in the Electromagnetic spectra of radiations.
 - d. Does the shape of antennas affect the radiation propagation? If so, how?
 - e. Mention the frequency range of the UHF band.
 - f. What do you mean by cut-off frequency?
 - g. How do you materialize an extrinsic semiconductor?
- Q-5 Attempt all questions (14)**
- a. Write a brief note on Ionospheric propagation of radiation. (08)
 - b. Explain the concept of satellite communication. (06)
- OR**
- Q-5 a. Derive the expression for maximum usable frequency in case of sky wave propagation. (08)**
- b. Elaborate on the concept of Tropospheric propagation. (06)**
- Q-6 Attempt all questions (14)**
- a. Derive the expression connecting directivity and effective area of antennas. (07)
 - b. Mention the various possible antenna patterns. (07)
- OR**
- Q-6 Attempt all Questions (07)**
- a. What is the difference between parabolic and helical antennas? How does their shape affect their sensitivity? (07)
 - b. Explain the operation of magic tee with necessary diagrams. (07)

