SCHOOL OF SCIENCES

UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)

उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

M.Sc. Physics (MSCPHY12)

Second Year Assignment

Last Date of Submission: 15 May 2014

Course Title: Microwave devices and Communication systems

Course Code: PHY-554

Year : 2013-14

Maximum Marks :40

Section A

Section 'A' contains 08 short answer type questions of 5 marks each. Students are required to answer 4 questions only. Answers of short answer type questions should be in 250 words approximately.

1- What are the characteristics of rectilinear waveguide? Derive the field equations and discuss the propagation.
2- What are the properties of S matrix? Write the S matrix for 2 port junction.
3- Discuss wave guide components. Define coupling factor and directivity.
4- Explain the operation of tunnel diode as microwave amplifier.
5- What do you understand by detection? Draw a circuit diagram of diode detector and explain its working.
6- How many stations can be broadcast within a band of 12MHz bandwidth simultaneously without interfering with each other? Take maximum audio signal frequency employed for modulating the carrier not to exceed 15 kHz.
7- RMS value of a RF voltage after amplitude modulation to a depth of 60% by a sinusoidal voltage is 60V. Calculate the rms value of modulated voltage when modulation to depth of 75%.
8- Discuss how transistor works as AM modulator. Draw circuit diagram for collector modulation and base modulation, and explain its working.

Section B

Section ‘B’ contain 04 long answers type question of 10 marks each and students are required to answers 02 questions only.

1- Describe modulation and demodulation.
2- Describe antenna, antenna theorem, radiation pattern, gain and effective length of an antenna.
3- What is parabolic reflector? Describe the geometry of parabolic reflector in transmitting mode and its radiation. Explain horn antenna also.
4- Explain RADAR in detail and derive RADAR range equation.