Total Pages : 3 Roll. No. : .....

Examination Session June-2022

(Fourth Semester)

MPHY-609

M.Sc. PHYSICS (MSCPHY)

[Communication System]

Time : 2 Hours] **[Max. Marks : 40**

Note : This paper is of Forty (40) marks divided into two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION—A

(Long-Answer-Type Questions)

Note : Section 'A' contains five (05) long-answer-type questions of Ten (10) marks each. Learners are required to answer any two (02) questions only. 2×10=20

1. What do you mean by modulation and demodulation ? Why frequency modulation is preferred over amplitude modulation ?

2. Discuss in detail about two way cavity klystron and also derive the expression for output power and efficiency.

3. State and prove antenna theorem. What is directivity ? Derive an expression for the directivity.

4. Describe the construction of helical antenna. Discuss the radiation pattern of helical antenna.

5. Explain about the function of a basic Radar system. Derive an expression for the Radar range equation and also mention the applications of Radar.

SECTION—B

(Short-Answer-Type Questions)

Note : Section 'B' contains eight (08) short-answer-type questions of Five (05) marks each. Learners are required to answer any four (04) questions only. 4×5 = 20

1. Explain the phenomenon of bunching process.
2. What is the principle of operation of travelling wave tube ?
3. Explain the principle of square law detector.
4. Derive an expression for the effective area or effective aperture in antenna.
5. Find out an expression for the radiative resistance of loop antenna.
6. Describe the operation of a parabolic reflector.
7. Derive an expression for the Doppler frequency shift 'f_d' for CW Radar.
8. Describe the technique used in Radar for tracking of a target.

****