**Total No. of Questions : 4]**

**SEAT No. :** ____

**P8497**

**[Total No. of Pages : 2**

# Oct-22/BE/Insem-90

## B.E. (E & TC)

## RADIATION AND MICROWAVE THEORY

## (2019 Pattern) (Semester - VII) (404181)

***Time : 1 Hour]*** ***[Max. Marks : 30***

***Instructions to the candidates:***

1) ***Answer Q. 1 or Q. 2 and Q.3 and Q.4.***
2) ***Draw neat diagrams wherever necessary.***
3) ***Figurs to the right side indicate full marks.***

***Q1)*** a) Calculate the power density reaching the moon's surface from 1MW pulse transmitter located on the earth. The antenna gain is 55 db. The distance between the moon and earth 4,00,000 km. **[4]**

b) Explain the following characteristics of antenna in detail : **[5]**

i) Radiation Pattern

ii) Efficiency

c) Explain the details the radiation mechanism of antenna with suitable diagram. **[6]**

OR

***Q2)*** a) Derive the fundamental equation for free space propagation. **[4]**

b) The radiation resistance of an antenna is 72Ω and loss resistance is 8Ω. Calculate directivity in db if power gain is 16. **[5]**

c) Enlist the different types of antennas. Explain any two types in detail. **[6]**

***P.T.O.***

***Q3)*** a) Give the comparison between co-axial cable and waveguide. **[4]**

b) What are micro waves. Enlighten on advantages and applications of microwave. **[5]**

c) What is cavity resonator. Explain re-entrant type of cavity resonator. **[6]**

OR

***Q4)*** a) Give the comparison between TE Mode and TM Mode. **[4]**

b) Explain the Structural details, types and applications of Striplines. **[5]**

c) An air-filled rectangular waveguide of dimension 8×4cm operates in the dominant TE 10 mode. **[6]**

Find :

i) The cut off frequency

ii) Phase velocity at operating frequency of 3.5 GHz and

iii) Guide Wavelength