

510702

Roll No. |

Total No of Pages: 17

510702

B. Tech. V - Sem. (Main) Exam., December - 2020
Electronics & Communication Engineering
SEC4 - 02 Electromagnetics Waves

Maximum Marks: 120
Min. Passing Marks:

Time: 3 Hours

Instructions to Candidates:

Part - A: Short answer questions (up to 25 words) 10×2 marks = 20 marks.
All ten questions are compulsory.

Part - B: Analytical/Problem solving questions 5×8 marks = 40 marks.
Candidates have to answer **five** questions out of **seven**.

Part - C: Descriptive/Analytical/Problem Solving questions 4×15 marks = 60 marks.
Candidates have to answer **four** questions out of **five**.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

- Q.1 Define Electric flux density. [2]
Q.2 What are the applications of Poynting theorem? [2]
Q.3 Define Uniform plane wave [2]
Q.4 State Ampere's circuital law. [2]
Q.5 Define Antenna. [2]
Q.6 Define Polarization. [2]
Q.7 Define Poynting vector. [2]
Q.8 Define the radiation resistance of an antenna. [2]

- Q.9 Define Open circuited line. [2]
- Q.10 Give the limitation of Gauss's law. [2]

PART - B

- Q.1 (a) Define the terms phase velocity and group velocity. [4]
- (b) If the group velocity is 0.9×10^8 m/s then find the corresponding phase velocity. [4]
- Q.2 Explain any four antenna parameters in brief. [8]
- Q.3 Explain TEM mode in brief. Why TEM mode is not possible inside waveguide. [8]
- Q.4 What is Smith Chart? List the applications of Smith Chart. [8]
- Q.5 State and prove the Gauss law. [8]
- Q.6 Show that a uniform plane wave propagating in particular direction, does not contain any field components in that particular direction. [8]
- Q.7 State and explain Poynting theorem. [8]

PART - C

- Q.1 Discuss about TE modes in parallel plane waveguides. [15]
- Q.2 (a) Explain about construction of Smith Chart. [10]
- (b) Explain the following - [5]
- (i) Matched Line
- (ii) Shorted Line
- Q.3 (a) Explain the relations between E and H in uniform plane wave. [10]
- (b) Define VSWR. Give the relationship between VSWR and reflection coefficient. <https://www.btubikaner.com> [5]
- Q.4 Explain in brief the radiation from the Hertz dipole. Derive the equation for the power radiated by Hertz dipole. [15]
- Q.5 (a) Define Brewster's angle and derive an expression for Brewster's angle when a wave is parallelly polarized. [10]
- (b) Define Infinite Line and Lossless Line. [5]

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