

Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]

[Total No. of Pages: .....]

Uni. Roll No. ....

Program: B.Tech. (ECE)

Semester: 4

Name of Subject: Electromagnetic Field Theory

Subject Code: PCEC-108

Paper ID: 16224

MORNING  
19 SEP 2022

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Summarize the concept of displacement current.
- b) What are plane waves.
- c) Define wave impedance.
- d) Illustrate the characteristics of rectangular and circular waveguides.
- e) Determine the boundary conditions.
- f) Formulate the expression for distortion-less line.

Part – B

[Marks: 04 each]

- Q2. Summarize the equations for velocities of propagation.
- Q3. Interpret the reflection of waves by perfect insulators.
- Q4. Develop the expression for TM waves in rectangular waveguide.
- Q5. Construct the Maxwell's equation in differential form.
- Q6. Examine the attenuation in parallel plane guides for TE mode.
- Q7. Analyze the parallel plane transmission line with losses.

Part – C

[Marks: 12 each]

- Q8. Define Poynting theorem and prove its statement.

OR

Develop the circuit representation of parallel plane transmission lines.

Q9. Evaluate the parameters of characteristics of TM waves in parallel planes.

OR

A rectangular waveguide with dimensions  $3 \times 2 \text{ cm}$  operates at 10 GHz. Estimate  $f_c$ ,  $\lambda_c$ ,  $\lambda$ ,  $\lambda_g$ ,  $\beta_g$ ,  $v_g$  of  $TE_{10}$  mode.

\*\*\*\*\*

MORNING  
19 SEP 2022