

**B.TECH SEM - V (2007 COURSE) (E & TC ENGG.) : SUMMER .
2018**

SUBJECT: ELECTROMAGNETIC ENGINEERING

Day: **Friday**
Date: **25/05/2018**

S-2018-2698

Time: **10.00 AM TO 01.00 PM**
Max Marks: 80

N.B.:

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt questions **ANY TWO** questions from each section.
- 2) Answer to both the section should be written in **SEPARATE** answer book.
- 3) Figure to the right indicates **FULL** marks.
- 4) Assume suitable data if necessary.
- 5) Use of non-programmable **CALCULATOR** is allowed.

SECTION-I

- Q.1** a) State and prove Gauss's law. (05)
b) Derive Faraday's law in point form and explain its significance. (05)
c) Write a note on depth of penetration. (04)
- Q.2** a) Define flux density \vec{D} . State and prove the differential form of Gauss's law. (07)
b) Derive the boundary conditions for electric field at an interface between two dielectric media. (06)
- Q.3** a) Explain Maxwell's equation for time varying fields. (07)
b) Develop Poynting theorem for electromagnetic field. (06)
- Q.4** a) Derive an expression for skin depth for propagation of plane wave in good conductor. (07)
b) The electric field intensity associated with a plane wave travelling in a perfect dielectric medium is given by $E(z, t) = 10 \cos(2\pi \times 10^7 t - 0.1\pi x)$ v/m. Calculate velocity of propagation and the magnetic field if $\mu = \mu_0$. (06)

SECTION-II

- Q.5** a) What are the primary and the secondary constants of a transmission line? (05)
b) What are antenna towers? Explain. (05)
c) Write a short note on Microstrip Antenna. (04)
- Q.6** a) What is single stub matching? Explain the merits and demerits of single stub matching. (07)
b) State and explain the primary constants of a transmission line. (06)
- Q.7** a) Derive the expression for power radiated by half wave dipole and its radiation resistance. (07)
b) Write a short note on antenna parameters. (06)
- Q.8** a) Explain the directive properties of a broadside and end fire array. (07)
b) Explain how microwave antenna can be used microwave transmission and reception. Give its merits and demerits. (06)

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