

Roll No.

Total No. of Questions : 09]

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B.Tech.(ECE/ETE)(Sem. - 4th)

ELECTROMAGNETICS & ANTENNAS

SUBJECT CODE : BTEC - 403(2011-Batch)

Paper ID : [A1191]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is Compulsory consisting of **Ten** questions carrying **Two** marks each.
- 2) Section - B contains **Five** questions carrying **Five** marks each and students has to attempt any **Four** questions.
- 3) Section - C contains **Three** questions carrying **Ten** marks each and students has to attempt any **Two** questions.

Section - A

Q1)

- a) Show that the directivity of isotropic antenna is unity.
- b) Write down the reasons for using an antenna array in practice.
- c) What is stray factor?
- d) Name the types of layers present in the ionosphere.
- e) What are the modes of propagation?
- f) The duct propagation is useful to reduce the effect of curvature of earth.
(T/F)
- g) Troposcatter propagation is related to _____.
- h) The expression for MUF for the flat surface is _____.
- i) D-layer exists at all times. (T/F)
- j) The critical frequency of the ionospheric layer is _____ (expression).

Section - B

- Q2) Derive the equations for BWFN and directivity of end fire array.
- Q3) A Parabolic dish provides a gain of 75db at a frequency of 15 GHz. Calculate the capture area of the antenna and null beam widths.
- Q4) A loop of 10 turns and area 1m^2 lies in a plane making an angle 30° with the direction of propagation of an incoming signal of frequency 150kHz. What is the field strength of the signal if the emf induced in the loop is 1.5mV?
- Q5) Derive the expression for the field strength in the space wave propagation for the flat surface of earth.
- Q6) Derive wave equation for conducting media.

Section - C

- Q7) Prove that the radiation resistance of infinitesimal dipole is given as
- $$R_r = 80\pi^2 (l/\lambda)^2$$
- Q8) Derive the expression for characteristic impedance of infinite Biconical Antenna.
- Q9) Derive the expression for wave impedance for TE waves.

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