Roll No. Total No. of Pages: 02

Total No. of Questions: 09

B.Tech.(Electronics Engg.)(2012 onward) (ECE)/ETE(2011 Onwards) (Sem.-4)

ELECTROMAGNETICS & ANTENNAS

Subject Code: BTEC-403 Paper ID : [A1191]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTION TO CANDIDATES :

- SECTION-A is COMPULSORY consisting of TEN questions carrying each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students 2. has to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

l. Write briefly:

- a) Define scanning array.
- b) Compare optimum working uency and lowest frequency, also give their range.
- c) Write causes of attenuation in a transmission line.
- d) What is a virtual height and skip distance?
- e) Differentiate between power gain and directive gain of an antenna.
- Define retarded vector and scalar potential.
- State Poynting Theorem.
- h) Give analogy of transmission line for waveguide.
- i) Compare grounded and ungrounded antenna.
- j) Define radiation pattern of an antenna.

SECTION-B

- 2. Starting from the Maxwell's equation discuss the propagation of plane electromagnetic wave in conducting medium.
- 3. Explain and derive the general solution of transmission line terminated with any load impedance.
- 4. Give the expression for directions of pattern maxima and minima for array of *n* isotropic sources of equal amplitude and spacing (take case of broadside)
- 5. Discuss in detail field equivalence principle.
- 6. Derive an expression for field strength for a space or tropospheric propagation at any distance.

SECTION-C

- 7. Derive the field components radiated by a short dipole; also discuss the near and far field regions.
- 8. Design a broadside Dolph-Tschebscheff array of 10 elements with spacing d between the elements and with a major-to minor lobe ratio of 26 dB. Find the excitation coefficients and form the array factor.
- 9. Derive field component when wave is propagating in a circular wagveguide with TM mode of propagation.