III B. Tech I Semester Supplementary Examinations, May -2016
ANTENNAS AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
       2. Answering the question in **Part-A** is compulsory
       3. Answer any **THREE** Questions from **Part-B**
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PART –A

1   a)   Distinguish between isotropic and directional radiators.   [3M]

    b)   What is a retarded potential?   [3M]

    c)   Why array antennas are preferred over a single radiator?   [4M]

    d)   Distinguish between resonant and non-resonant radiators.   [4M]

    e)   What are the applications of reflector antennas?   [4M]

    f)   What is the effect of earth's curvature on radio wave propagation?   [4M]

PART -B

2   a)   Explain antenna radiation mechanism with a two wire line.   [8M]

    b)   The radial component of the radiated power density of an infinitesimal linear dipole is given by $W_{av} = A_0 \sin^2\theta / r^2 \, a_r \, W/m^2$. Find its maximum directivity.   [8M]

3   a)   Derive the expressions for field components of an alternating current element located at the origin?   [12M]

    b)   What are Radiative, inductive and electrostatic field components derived in the above expressions?   [4M]

4   a)   Prove that maximum of the first minor lobe is 13.46 db down from the maximum at the major lobe of an N-element linear array.   [8M]

    b)   What is broadside array and derive the expression for angles of nulls, maxima and half power points?   [8M]

5   a)   Give the construction details and radiation pattern of travelling wave antenna.   [8M]
    b)   Explain the working of helical antenna in axial mode?   [8M]

6   a)   What is aperture blocking and how to avoid it with cassegrain feed mechanism?   [8M]
    b)   Explain in detail about pyramidal horn antenna.   [8M]

7   a)   Write the expression for field strength of ground wave and explain all the terms.   [8M]
    b)   How earth's surface reflects radio waves?   [8M]

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