Roll No. ☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 01

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M.Tech. ECE (Wireless Communication) (2018 Batch)   (Sem.–2)
SMART ANTENNAS
Subject Code : MTWC-PE3A-18
M.Code : 76070

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1.   Attempt any FIVE questions out of EIGHT questions.
2.   Each question carries TWELVE marks.

1.   Explain radiation pattern, beam area, HPBW, FNBW, directivity, efficiency and gain of an antenna.

2.   What are the features of a smart antenna system? Write benefits of smart antennas. Also mention few applications of smart antennas in wireless systems.

3.   How mutual coupling between the antennas in an array affect the desired reception of the array? Explain this by considering an array of two antennas. Also, illustrate the method by which the coupling effect is normally modelled.

4.   Determine the complex weights of a two-element linear array, half wavelength apart, to receive a desired signal of unity magnitude while turning out a signal not-of-interest. The elements of the array are assumed to be isotropic and impinging signals are sinusoid.

5.   To expand coverage, increase capacity and improve signal quality, adaptive antenna array is used in wireless communication system. Explain the concept of adaptive antenna system by considering the case of beam forming. Also, describe how the weight vectors of adaptive array are adjusted by constant modulus algorithm.

6.   a) Give the overview of Direction-of-arrival (DOA) Algorithms.

     b) What is switched beam system? Explain.

7.   Explain the principles of Rake receiver in detail.

8.   Discuss the concept of Antenna beam forming. Explain the following in the context of smart antennas :

     a) Minimum Mean Square Error (MMSE)

     b) Least Mean Square (LMS) algorithms for optimal beam-forming

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.