BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.TECH **SEMESTER : I**
BRANCH: ECE **SESSION : MO/18**

SUBJECT: EC503 ANTENNAS AND DIVERSITY

TIME: 3.00 HRS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	Find the fields radiated by the rectangular aperture mounted on an infinite ground plane.	[5]
Q.1(b)	A rectangular aperture with a constant field distribution with a=6λ and b=4 λ ,is mounted on an infinite ground plane. Calculate i)FNBW in E plane ii) Total HPBW in E plane iii) Total beam width FSLBW in E plane iv) Directivity	[5]
Q.2(a)	Derive the field expression for quadratic phase term of an E-plane horn antenna for of the dominant mode.	[5]
Q.2(b)	A helical antenna has 10turns,100mm diameter and 70mm spacing, operates at a frequency 1GHZ i) Calculate HPBW and Directivity. ii) If It is in AXIAL mode what are the requirements for circular polarization?	[5]
Q.3(a)	What are the major characteristics of DRA?	[5]
Q.3(b)	Explain coupling mechanism in DRA along with field equations.	[5]
Q.4(a)	What is smart Antenna? How SDMA used in Smart Antenna Technology?	[5]
Q.4(b)	What is the difference between cell splitting and cell sectoring in Smart Antenna System? Explain with diagram.	[5]
Q.5(a)	What is the need of diversity? Distinguish between polarization, frequency and time diversity.	[5]
Q.5(b)	What is the basic difference between Microscopic and Macroscopic Diversity? Explain the working of combining technique for Macroscopic diversity.	[5]

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