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

CLASS: BE **SEMESTER : VII/ADD**
BRANCH: ECE **SESSION : MO/18**

SUBJECT: EC7203 ANTENNAS& WAVE PROPAGATION FOR WIRELESS COMM

TIME: 3.00 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
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)	What is Hertzian dipole? Write down the expression for radiation resistance of Hertzian dipole?	[2]
Q.1(b)	A 50W transmitter at 900 MHZ is radiating into free space using linearly polarized omni directional antenna. Calculate the power density and the electric field intensity at a distance of 10km from the antenna along the direction of main lobe.	[4]
Q.1(c)	Derive the expression for power radiated and find the radiation resistance of a HW dipole?	[6]
Q.2(a)	Draw the radiation pattern of two non directional radiators fed with equal currents at 0degree spaced at d=λ/2 and d=λ.	[2]
Q.2(b)	A uniform linear array is required to produce an end-fire beam when it is operated at a frequency of 5GHZ. It contains 60 radiators and are spaced at 0.5λ. Find the progressive phase shift required to produce the end –fire beam and the array length	[4]
Q.2(c)	What are the limitations in uniform and binomial arrays? What is the advantage of Tschebyscheff method. Explain this method in brief.(different steps only)	[6]
Q.3(a)	Draw a neat diagram of three element Yagi –Uda antenna and explain the function of each element.	[2]
Q.3(b)	Compare resonant and non resonant antennas.	[4]
Q.3(c)	Explain working principle of log-periodic antenna with neat diagram. Mention one of its important application.?	[6]
Q.4(a)	What is the need of shape beam antennas in communication?	[2]
Q.4(b)	For what mouth diameter and capture area of a paraboloid reflector is BWFN of 12degree obtained when it is operated at 2GHZ.?	[4]
Q.4(c)	With the help of neat diagram Derive the expression for impedance of slot antenna.	[6]
Q.5(a)	What is Microstrip patch antenna?	[2]
Q.5(b)	Compare different feeding technique used in microstrip antenna.	[4]
Q.5(c)	With the help of neat diagram explain Transmission line model analysis in microstrip patch antenna.	[6]
Q.6(a)	What do you mean by electrically small antennas?	[2]
Q.6(b)	What are the requirements of antennas for satellite antennas?	[4]
Q.6(c)	Explain UWB antennas with applications.	[6]
Q.7(a)	Why horizontal polarized antennas are not used in Ground wave propagation.?	[2]
Q.7(b)	What is the basic difference between Critical frequency and MUF? Determine the MUF of EM wave between two points on the earth's surface at a distance of 2500km, at the height of the Ionospheric layer and critical frequency is 4MHZ.	[4]
Q.7(c)	Define Radio Horizon. Is it different from optical horizon? Derive the expression for Radio Horizon distance between transmitting and receiving antennas.	[6]

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