

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April-May 2015
B. Tech in Electronics and Communication Engineering, Semester VI



Roll No.....

COURSE CODE: Microwave Engineering II (ECE 601) Time: 3 hours Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	Barraters are used for the measurement of (a) VSWR (b) impedance (c) power (d) frequency	
ii.	For tacking the RADAR antenna beam pattern is (a) Omni directional (b) isotropic (c) highly directive (d) none of these	
iii.	In satellite communication (a) Uplink frequency is greater than downlink frequency (b) Uplink frequency is equal to downlink frequency (c) Uplink frequency is less than downlink frequency (d) Any one of these	
iv.	A geostationary satellite can cover (a) Entire earth surface (c) one hemisphere in one pass (b) One side of the earth (d) an area depending on the antenna used	
v.	If the peak transmitted power in a RADAR system is increased 81 times, then the maximum range will be increased by a factor (a) 3 (b) 9 (c) 27 (d) 81	
vi.	The FNBW of an antenna (a) is less than HPBW (c) is greater than HPBW (b) may be equal to HPBW (d) any one of these	
vii.	A dipole antenna is a (a) Conduction current antenna (c) Displacement current antenna (b) includes both displacement and conduction current (d) none of these	
viii.	The antenna most commonly used for TV broadcasting in UHF band is (a) Parabolic disc antenna (c) dipole antenna (b) Yagi-Uda antenna (d) patch antenna	
ix.	For measurement of high VSWR, the proper method is (a) Single minima method (c) either (a) or (b) (b) Double minima method (d) none of these	
x.	The VSWR meter is basically a (a) DC amplifier (c) narrow band amplifier (b) Demodulator (d) wideband amplifier	



Q.2	Short answer type questions (4 questions @ 2.5 marks) (a) antenna efficiency (b) radiation intensity (c) directive gain (d) radiation pattern of antenna	10
Q.3A	What is horn antenna? Describe different types of horn antenna.	05
Q.3B	Derive the expression to find the maximum and minimum distance of a satellite from any point on the earth.	05
Q.4A	Describe the construction of a Yagi-Uda antenna and its principle of operation.	05
Q.4B	Describe and classified the satellite orbit and also derive the expression of orbital period of the satellite in minutes.	05
Q.5A	Describe calorimetric method for the measurement of high power.	05
Q.5B	What is Bolometer? How is it used to measure an unknown power?	05
Q.6A	How can microwave be used to measure the thickness of a metal and dielectric sheet?	05
Q.6B	How can microwave be used to measure the moisture content?	05
	OR	
Q.6B	How can microwave be used for heating? Describe different applications of microwave heating.	05
Q.7A	List the advantages and disadvantages of waveguides.	05
Q.7B	An antenna has radiated power density in the main lobe is $1.4 \mu\text{W}/\text{m}^2$ and input power 100 W then calculate the gain of the antenna.	05
	OR	
Q.7B	A geostationary satellite operating at 4 GHz is 35,860 km away from the earth's surface. Calculate the surface loss of ratio?	05
Q.8A	Describe the slotted line method for the measurement of unknown impedance.	10
Q.9A	The mouth diameter and HPBW of a parabolic reflector are 5 m and 2.5° , respectively. Calculate the operating frequency and power gain of the antenna.	10
Q.9B	Derive the expression for the virtual height in terms of distance between transmitting and receiving points, and transmitting angle for curved earth surface.	10
	OR	
Q.9B	Derive the expression for radar range equation in terms of noise figure and transmitted pulsed power.	10