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Code No. : 16402

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (ECE: CBCS) VI-Semester Main Examinations, May-2019

Transmission Lines & Antennas

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q.No.	Stem of the question	M	L	CO	PO
Part-A (10 × 2 = 20 Marks)					
1.	List the advantages of m-derived filters?	2	1	1	1
2.	Show that a transmission line with physical length $\lambda/4$ meters acts like a impedance inverter.	2	1	2	1
3.	The magnitudes of the open circuit and short circuit input impedances of a transmission line are 100Ω and 25Ω respectively. Calculate the characteristic impedance of the line?	2	2	2	1
4.	Short circuit stubs are preferred over the open circuit stub? Justify the statement	2	2	2	1
5.	Differentiate the terms of half power beam width and First null beam width of an antenna	2	1	3	1
6.	Draw the radiation pattern of loop antenna with radius less than $\frac{\lambda}{10}$.	2	1	3	1
7.	Distinguish between broadside array and end fire array antennas?	2	2	4	1
8.	Write the applications of turnstile antenna?	2	1	4	1
9.	What is the necessity of flaring aperture in horn antenna?	2	2	5	1
10.	Which factors support to improve the Band width of Log-Periodic antenna array?	2	1	5	1
Part-B (5 × 10 = 50 Marks)					
11. a)	Design a Composite low pass filter with the following specifications $f_c = 2400\text{Hz}$, $f_\infty = 2500\text{Hz}$, $R_k = 600\text{ohms}$. Use T-section to develop a Composite filter.	7	3	1	1,3
b)	Explain the nature of secondary constants of a transmission lines if the line is lossless and low loss type.	3	2	2	1,2
12.	A lossless transmission line with characteristic impedance 50Ω is terminated with the load impedance of $100+j125\Omega$. Using Smith chart Determine the following parameters i) Reflection Coefficient, Transmission Coefficient at load end. ii) VSWR on the transmission line. iii) Distance from the load to get first voltage minimum and current minimum. iv) The impedance on the transmission line at a distance of 0.8λ from the load.	10	4	2	1,5

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13. a)	Briefly explain the basic radiation principle of a wire antenna.	5	2	3	1
b)	Derive the expressions for radiation fields of an infinitesimal dipole antenna in the far field.	5	2	3	1
14. a)	Determine the array factor if the two isotropic sources are excited with identical amplitude and phase currents which are separated by a distance of $\frac{\lambda}{2}$. Also draw the radiation pattern for the array.	5	3	4	1,2
b)	Explain the working principle of helical antenna and write its design procedure?	5	3	4	1,2
15. a)	Design a Yagi-Uda antenna with 3 elements at a frequency of 500 MHz.	5	2	5	1,2
b)	Briefly explain the advantages and disadvantages of micro strip antennas?	5	2	5	1
16. a)	Distinguish between Heaviside and lumped loading of a cable?	5	2	1	1
b)	Briefly explain parallel single stub matching technique?	5	2	2	1
17.	Write short notes on any two of the following:				
a)	Antenna polarization.	5	2	3	1
b)	Pattern Multiplication with reference to antenna arrays.	5	2	4	1
c)	Parabolic reflector antenna.	5	2	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	65
2	Knowledge on application and analysis (Level-3 & 4)	35
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	Nil

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