

Name:



Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

END SEMESTER EXAMINATION, DECEMBER 2018

COURSE: ANTENNA AND WAVE PROPAGATION ELEG 361

SEMESTER: V

Program: : B.Tech., EE &BCT

Time: 03 hrs

Max. Marks: 100

Instructions: All Diagrams should be sketched by Pencil

SECTION A

5x4=20

S. No.	QUESTION	Marks	CO
1.	What is loop antenna and discuss why it is mainly used for radio detection finding?	4	CO1
2.	Distinguish cassegrain feed and front feed for parabolic reflectors.	4	CO2
3.	Discuss binomial array in detail.	4	CO1
4.	Discuss the distance requirement for the measurement criterion.	4	CO4
5.	Briefly describe the three types of propagation with help of neat sketch	4	CO5

SECTION B

4x10=40

6.	Distinguish Broad side array and end fire array.	10	CO2
7.	What is V- antenna? Draw the Radiation pattern of leg of V-Antenna that has length equal to twelve times of its half wavelength.	10	CO3
8.	Deliberate the design aspects of folded dipole antenna.	10	CO2
9.	Discuss the gain measurement of an antenna with standard gain antenna method.	10	CO4

SECTION-C

2x 20

10.	(a)Determine Maximum usable frequency if the critical frequency 15MHz and the skip		CO5
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	<p>distance is 1500Km and the radio wave has travelled the height of 750km in the sky. Find the critical frequency if the incident angle is 60°</p> <p>(b) Design 5-element Yagi Uda determine the lengths of the reflectors and directors to transmit the frequency of 30 MHz Design the antenna dimensions of its driven element and parasitic elements. Draw its radiation pattern</p>	<p>10</p> <p>10</p>	<p>CO3</p>
11.	<p>(a) Discuss reflector antenna and corner reflector. Form the images of the driven source for a dipole put in front of corner reflector at a distance s and with included angle 90° and determine the coupling factor and pattern factor.</p> <p>(b) Explain the perspective of parasitic elements in antenna array.</p> <p>(or)</p> <p>(c) What is helical antenna? Draw the polarization plot of helical wire antenna and draw equivalent of helical antenna.</p> <p>(d) Determine the gain and beamwidth of an helical antenna with 6 turns and has spacing between turns 2.66cms with circumference of a turn 6.5 cms.</p>	<p>15</p> <p>5</p> <p>10</p> <p>10</p>	<p>CO3</p> <p>CO4</p> <p>CO4</p> <p>CO4</p>

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SECTION A

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S. No.	QUESTION	Marks	CO
1.	What is radiation intensity explain with an expression. What is normalized power pattern?	4	CO1
2.	Discuss the design aspects of patch antenna	4	CO2
3.	Write about the folded dipole and determine its input impedance.	4	CO3
4.	Discuss the distance requirement for the measurement criterion.	4	CO4
5.	Explain the terms with neat sketch for (i)Maximum usable frequency (ii)Skip distance.	4	CO5

SECTION B

4x10=40

6.	(a)Distinguish Broad side array and end fire array with help of neat sketches. Discuss array which has the antenna elements arrangement follow the coefficients	10	CO1
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	of Pascal's triangle and explain the main feature of this array.		
7.	Discuss MUSA of rhombic antenna array in detail. Discuss the design parameters of rhombic antenna	10	CO2
8.	(a)Discuss parabolic reflector antenna and discuss in detail the spill over and block range. (b) Explain the cassegrain feed and front feed arrangement with parabolic reflector	7 3	CO3
9.	Discuss the gain measurement of an antenna with standard gain antenna method.	10	CO4
SECTION-C			
10.	(a)Determine (i)critical frequency (ii)Maximum usable frequency (iii) Refractive index, if the incident wave from a antenna from ground station is thrown with an angle 30^0 and the concentration of electron density is 81 cc/mm^3 (b)Design 5-element Yagi Uda determine the lengths of the reflectors and directors to transmit the frequency of 30 MHz. Design the antenna dimensions of its driven element and parasitic elements. Draw it radiation pattern.	10 10	CO5 CO3
11.	(a)What is helical antenna? Draw the polarization plot of helical wire antenna and draw equivalent of helical antenna. (b)Determine the gain and beamwidth of an helical antenna with 6 turns and has spacing between turns 2.66cms with circumference of a turn 6.5 cms. (or) (c) For a 2 element linear antenna array separated by a distance $d=3\lambda /4$, derive the field quantities and draw its radiation pattern for the phase difference of 45^0 . (d)Determine Maximum usable frequency if the critical frequency 15MHz and the skip distance is 1500Km and the radio wave has travelled the height of 750km in the sky. Find the critical frequency if the incident angle is 60^0 .	10 10 10 10	CO2 CO1 CO5

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