UNIT-1: ANTENNA BASICS

1 . <i>A</i>	Antennas convert		[]
	a) Photons to electrons	b) electrons to photons		
	c) Both a and b	d) none		
2. /	Antennas are of types		[]
	a) Two	b) four		
	c) Infinite	d) none		
3. \	Which of the following is true		[]
	a) Time changing current radiates	b) accelerated charges radia	tes	
	c) Both a and b	d) none		
4. F	Radiation pattern is dimensional o	quantity	[]
	a) Two	b) three		
	c) Single	d) none		
5	is also called as 3-dB bandwidth		[]
	a) FNBW	b) HPBW		
	c) Both a and b	d) none		
6. 0	One steradian is equal to square de	egrees	[]
	a) 360	b) 180		
	c) 3283	d) 41,253		
7	is independent of distance		[]
	a) Poynting vector	b) radiation intensity		
	c) Both a and b	d) none		
8. 1	The minimum value of the directivity of an ant	tenna is	[]
	a) Unity	b) zero		
	c) Infinite	d) none		
9. [Directivity is inversely proportional to		[]
	a) HPBW	b) FNBW		
	c) Beam area	d) Beam width		
10.	Gain is alwaysthan directivity		[]
	a) Greater	b) lesser		
	c) Equal to	d) none		
11.	Directivity and Resolution are		[]
	a) Different	b) same		
	c) Both a and b	d) none		
12.	Effective aperture is always than Phy	ysical aperture.	[]
	a) Higher	b) lower		
	c) Both a and b	d) none		
13.	Theorem can be applied to both cir		[]
	a) Equality of patterns	b) Equality of impedance		
	c) Equality of effective lengths	d) Reciprocity theorem		
14.	Antenna temperature considersparame		[]
	a) Directivity	b) gain		
	c) Beam area	d) beam efficiency		
15.	Radiation resistance of antenna is		[]
	a) Physical resistance	b) Virtual Resistance		
	c) Both a and b	d) none		

ANTENNAS AND WAVE PROPAGATION

2015

16. Antenna aperture is same as		[]
a) Length	b) width		
c) Area	d) volume		
17. The source of scalar potential is		[]
a) Charge density	b) Current density		
c) Both a and b	d) none		
18. The source of vector potential is]
a) Charge density	b) Current density		
c) Both a and b	d) none		
19. R/v is called		[]
a) Radiation to voltage ratio	b) resistance to velocity ratio		
c) Propagation delay	d) none		
20. Which condition makes coupled equations into u	incoupled equations	[]
a) Retarded	b) Helmholtz		
c) Lorentz gauge	d) none		

Q. No.	ANSWER	Q. No.	ANSWER
1	С	11	В
2	С	12	В
3	С	13	D
4	В	14	В
5	В	15	В
6	С	16	С
7	В	17	Α
8	Α	18	В
9	С	19	С
10	В	20	С

UNIT-2: THIN LINEAR WIRE ANTENNAS

1. Alternating current element is given by		L	J
a)I dl	b) I dl cosωt		
c) I dl sinωt	d) I		
2potential is used to find the field components	of current element	[]
a) Scalar Potential, V	b) Vector Potential, A		
c) Both a and b	d) None		
3 is basic building block for any practical antenna	a	[]
a) Current element	b) Monopole		
c) Dipole	d) Loop		
4. The H _Φ Component will consists offield.		[]
a) Radiation	b) Induction		
c) Both a and b	d) All		
5. The E_{θ} Component will consists of		[]
a) Radiation	b) Induction		
c) Electro static	d) All		
6. The E _r Component will consists of		[]
a) Induction	b) Electro static		
c) Both a and b	d) All		
7. The induction and radiation fields of current element	are equal at distance of	[]
a) λ/2	b) λ/4		
c) \(\lambda/6\)	d) λ/10		
8. The radiation resistance of current element is given l	by	[]
a) $R_r = 80\Pi^2 (dI/\lambda)^2$	b) $R_r = 20\Pi^2 (dI/\lambda)^2$		
c) $R_r = 10\Pi^2 (dI/\lambda)^2$	d) None		
9. The radiation resistance of short dipole is given by		[]
a) $R_r = 80\Pi^2 (dI/\lambda)^2$	b) $R_r = 20\Pi^2 (dI/\lambda)^2$		
c) $R_r = 10\Pi^2 (dI/\lambda)^2$	d) None		
10. The radiation resistance of short monopole is given	by	[]
a) $R_r = 80\Pi^2 (dI/\lambda)^2$	b) $R_r = 20\Pi^2 (dI/\lambda)^2$		
c) $R_r = 10\Pi^2 (dI/\lambda)^2$	d) None		
TRUE OR FALSE	QUESTIONS		
11. The radiation resistance of current element is applic	cable to dipoles up to		
height of $\lambda/8$ only.		[]
12. The radiation resistance of current element is applicable height of $\lambda/4$ only.	cable to mono poles up to	[1
13. The radiation resistance of current element is applic	cable to	-	•
dipoles up to height of $\lambda/2$ only.		ſ	1
14. The radiation resistance of $\lambda/2$ dipole is 36.5 Ω		i	í
15. The radiation resistance of $\lambda/4$ Monopole is 73 Ω		į	j
· · · · · · · · · · · · · · · · · · ·		-	_

- 16. The E_{θ} Component of current element is given by-----
- 17. The E_r Component of current element is given by-----
- 18. The H_{Φ} Component of current element is given by-----
- 19. The main application of Loop Antenna is-----
- 20. The Directivity of Loop Antenna is ------

Q. No.	ANSWER
1	В
2	В
3	А
4	C
5	D
6	С
7	С
8	Α
9	В
10	C

Q. No.	ANSWER
11	FALSE
12	FALSE
13	FALSE
14	FALSE
15	FALSE

Q. No.	ANSWER
16	$E_{\theta} = \frac{I dL \sin \theta}{4 \pi \epsilon} \left[\frac{-\omega \sin \omega t'}{v^2 r} + \frac{\cos \omega t'}{v r^2} + \frac{\sin \omega t'}{\omega r^3} \right]$
17	$E_{r} = \frac{2 I dL \cos \theta}{4 \pi \varepsilon} \left[\frac{\cos \omega t'}{v r^{2}} + \frac{\sin \omega t'}{\omega r^{3}} \right]$
18	$H_{\phi} = \frac{I dL \sin \theta}{4\pi} \left[\frac{-\omega \sin \omega t'}{rv} + \frac{\cos \omega t'}{r^2} \right]$
19	Direction Finding
20	1.5

UNIT-3: ANTENNA ARRAYS

1. II the marriage antennas o	i the array are spacea equally along a straight line.		
Then It isarra		[]
a) Linear.	b) Non-Linear.		
c) Both a and b.	d) None.		
2. Linear array is a system of	spaced elements.	[]
a) Un equally.	b) equally.		
c) Both a and b.	d) None.		
3. In a Uniform Linear array a	ll elements are fed with a		
current ofampli	itude	[]
a) Equal.	b) Unequal.		
c) Both a and b.	d) None.		
4. In a Broad side array the ra	diation is along	[]
a) X-direction.	b) Y-direction.		
c) Both a and b.	d) None.		
5. In a end- fire array the radi	ation is along	[]
a) X-direction.	b) Y-direction.		
c) Both a and b.	d) None.		
6. In increased end- fire array	the radiation is along	[]
a) X-direction.	b) Y-direction.		
c) Both a and b.	d) None.		
7. Which array is also called as Hansen-Woodyard array.]
a) Broad side.	b) End-fire.		
c) Increased End-Fire	. d) Binomial.		
8. Which array is also called as	Stone's array.	[]
a) Broad side.	b) End-fire.		
c) Increased End-Fire.	d) Binomial.		
9. Hansen-Wood yard array is	aarray	[]
a) Linear.	b) Non-Linear.		
c) Both a and b.	d) None.		
10. Stone's array is aarr	ay	[]
a) Linear.	b) Non-Linear.		
c) Both a and b.	d) None.		
	TRUE OR FALSE QUESTIONS		
11. The radiation nattern of h	road side is array is along the normal direction		
Of array axis.	soud side is diray is diong the normal direction	ſ	1
12. The Binomial array is a line	ear array.	i	í
13. All coefficients of element		ľ	í
14. Minor lobes will exist in Lir	•	ľ	1
	ation pattern The phases will be multiplied using	L	,
Multiplication of patterns	•	ſ	1
	· · · · · · · · · · · · · · · · · · ·		

- 16. Hansen-Wood yard Array is a -----array.
- 17. The currents in Non linear are -----
- 18. Binomial array was invented by-----
- 19. The amplitudes will be ----- in the resultant pattern using principle of multiplication of Patterns.
- 20. The phases will be ----- in the resultant pattern using principle of multiplication of Patterns.

Q. No.	ANSWER	Q. No.	ANSWER
1	Α	11	TRUE
2	В	12	FALSE
3	Α	13	FALSE
4	В	14	TRUE
5	Α	15	FALSE
6	Α	16	LINEAR
7	С	17	Out of phase
8	D	18	Stone
9	Α	19	Multiply
10	В	20	Addup

UNIT-4: VHF, UHF and MW ANTENNAS-I

1. Microwave frequency range is	•	L	J
a) above 30MHZ	b) above 300MHZ		
C) above 200MHZ	d) above 2000MHZ.		
2. Yagi-Uda antenna consists of		[]
a) Folded Dipole	b) Reflector		
C) Director	d) All above		
3. The radiation resistance of folded d	lipole of equal radii is	[]
a) 6570hms	b) 292 Ohms		
C) 300 Ohms	d) 277 Ohms		
4. The radiation resistance of folded d	lipole of unequal radii (r ₂ =2r ₁) is	[]
a) 657Ohms	b) 292 Ohms		
C) 300 Ohms	d) 277 Ohms		
5. The helix is having the geometry of		[]
a) straight wire	b) cirle		
C) cylinder	d) All above.		
6. The radiation pattern of helix in Axi	ial mode is	[]
a) Bi directional	b) Uni directional		
C) 4 lobed	d) Omni directional		
7. The radiation pattern of helix in No	rmal mode is	[]
a) Bi directional	b) Uni directional		
C) 4 lobed	d) Omni directional		
8. In Normal mode of operation the le	ength of the helix is	[]
a) >λ	b) <λ		
C) =\(\lambda\)	d) none		
9. In Axial mode of operation the leng	th of the helix is	[]
a) >λ	b) <λ		
C) =λ	d) none		
10. Horn antennas used in the frequen	ncy range of	[]
a) VHF	b) UHF	_	_
C) SHF	d) MW		
•	E OD EALSE OLIESTIONS		
IRU	E OR FALSE QUESTIONS		
11. Yagi_Uda array is a parasitic array		[]
12. The reflector is longer than the fol	ded dipole in Yagi-Uda antenna.	[]
13. The director is shorter than the Fo	lded dipole in Yagi-Uda antenna.	[]
14. Stone invented Helical Antenna.		[]
15. Mushaike invented Horn antenna.		ſ	1

- 16. Radiation pattern of Yagi-Uda array is-----directional
- 17. Helical antenna was invented by-----
- 18. The path difference in horn antennas must be-----
- 19. The horn antennas are used in the frequency range of-----
- 20. The impedance of wave guides will be -----than Transmission lines.

Q. No.	ANSWER	Q. No.	ANSWER
1	С	11	TRUE
2	D	12	TRUE
3	В	13	TRUE
4	Α	14	FALSE
5	D	15	FALSE
6	В	16	Unidirectional
7	Α	17	John.D.Kraus
8	В	18	small
9	С	19	MW
10	D	20	higher

UNIT-5: VHF, UHF and MW ANTENNAS-II

1.Micro strip antenna was first introduced by	L	J
A). Marconi		
B). Hertz		
C). Munson		
D). Cassegrain		
2.The widely used shape for patch antennas is	[]
A). Rectangular		
B). Circular		
C). Elliptical		
D).Parabolic		
3.The efficiency of Micro strip antenna is	[]
A). High		
B). Very high		
C). infinite		
D). Low		
4.For square corner reflector the flaring angle is	[]
A). 30 degrees		
B). 60 degrees		
C). 90 degrees		
D). 180 degrees		
5. The no. of images formed for a square corner reflector, using method of images are	[]
A). 3		
B). 5		
C). 7		
D). 6		
6.The no. of images formed for a 30 degrees corner reflector, using method of	_	
-	[]
A). 3		
B). 5		
C). 7		
D). 6 7.The no. of images formed for a 60 degrees corner reflector, using method of		
	[1
A). 3	L	•
B). 5		
C). 7		
D). 6		
8. A single narrow beam of radiation results in square corner reflector for		
spacing of s=	[]
Α). 2λ		

B). λ C). 3λ/2		
D). λ/2		
9. Two narrow beams of radiation results in square corner reflector for		
spacing of s=	[]
Α). 2λ		
Β). λ		
C). $3\lambda/2$		
D). λ/2		
10. Three narrow beams of radiation results in square corner reflector for	_	_
spacing of s=	[]
Α). 2λ		
Β). λ		
C). 3 λ /2		
D). λ/2		
TRUE OR FALSE		
11. A parabola is a three dimensional curve.	[]
12. A paraboloid is a three dimensional curve.]]
13. Fermat's principle must be followed to get a plane wave front from the dish antenna.	[]
14. In any dish antenna arrangement the parabolic reflector will acts as primary antenna	[
15. In any dish antenna arrangement the parabolic reflector will acts as		
secondary antenna	[]
FILL IN THE BLANKS		
16. The directivity of the paraboloid is		
17. The generally used feed antenna for paraboloids is		
18. The horn and hyperbola are used infeed of dish antennas.		
19. The disadvantage (draw back) of parabolic reflector is		
20.The parabolic antenna operates in the frequency range of		

Q. No.	ANSWER	Q. No.	ANSWER
1	С	11	FALSE
2	Α		
3	D	12	TRUE
4	С	13	TRUE
5	Α		
6	С	14	FALSE
7	В		
8	D	15	TRUE
9	В		
10	С		

Q. No.	ANSWER
16	9.87(d/λ)²
17	HORN ANTENNA
18	CASSEGRAIN
19	SPILLOVER EFFECT
20	MW OR GHZ

UNIT-6: Lens Antennas

1.Electrical path length is increased inlens	antennas.	[]
a) Fast	b)Delay.		
c) Both a and b.	d)None.		
2. Electrical path length is decreased inlen	s antennas.	[]
a) Fast	b)Delay.		
c) Both a and b.	d)None.		
3. E plane metal-plate lens are oftype.		[]
a) Fast	b)Delay.		
c) Both a and b.	d)None.		
4. H plane metal-plate lens are oftype.		[]
a) Fast	b)Delay.		
c) Both a and b.	d)None.		
5. The following is the example of dielectric materia	ıl.	[]
a) Lucite.	b)Polystyrene.		
c) Both a and b.	d)None.		
6. All dielectric materials will have the refractive inc	dex of	[]
a) unity.	b)Less than unity.		
c) Greater than unity.	d)None.		
7. The design equation of lens antennas is given by		[]
a) $R = \frac{(n-1)L}{n\cos\theta - 1}$ b) $L = \frac{(n-1)R}{n\cos\theta - 1}$			
c) Both a and b.	d) None.		
8. All metals will have the refractive index of	-	[]
a) unity.	b)Less than unity.		
c) Greater than unity.	d)None.		
9. By zoning the lens refractive index will		[]
a) change.	b) not change.		
c) Both a and b.	d)None.		
10. In dielectric lens, difference in electrical path ler	ngth may be caused		
due to		[]
a) Length.	b)Width.		
c) Thickness.	d)None.		

TRUE OR FALSE QUESTIONS

11. All antenna measurements are accurate.	[]
12. All antenna measurements will be done in the far field	[]
13. Cylindrical coordinate system will be choosed for all antenna measurements.	[]
14. For better antenna measurements the tolerance value must be as large as possible.	[]
15. Anechoic chamber can be preferred for antenna measurements.	1	1

FILL IN THE BLANKS QUESTIONS

- 16. Frii's transmission formula is.....
- 17. Comparision method for measurement of antenna gain is also called as......
- 18. The formula for gain using comparision method is.....
- 19. In two antennas method the assumption is......
- 20. In the case of circular or elliptical polarizations the the total antenna gain is given by \mathbf{G}_{AUT}

=.....

Q.NO.	ANSWER
1.	b
2.	а
3.	а
4.	b
5.	C
6.	С
7.	а
8.	b
9.	b
10.	С

Q.NO.	ANSWER
11.	FALSE
12.	TRUE
13.	FALSE
14.	FALSE
15.	TRUE

Q.NO.	ANSWER
16.	$P_R = P_T G_T G_R (\lambda / 4\Pi R)^2$
17.	Gain-Transfer
18.	G _{AUT} = (P _{AUT} /P _{ref}) G _{ref}
19.	$G_R = G_T$
20.	G _H +G _V

UNIT-7&8: Wave Propagation

1) The troposphere is extends up to a height of		[]
A) 5km	B) 10km		
C) 15km	D) 20km		
2) For small distances the earth can be considered as	region	[]
A) flat	B) curved		
C) conductor	D) dielectric		
3) For large distances the earth can be considered as -	region	[]
A) flat	B) curved		
C) conductor	D) dielectric		
4) In general the earth will acts as a		[]
A) leaky resistor	B) leaky inductor		
C) leaky capacitor	D) leaky transistor		
5) According to Rayleigh if R>10, the reflecting surface	e will be considered as	[]
A) smooth region	B) rough region		
C) both a &b	D) none		
6) According to Rayleigh if R<0.1, the reflecting surfac	e will be considered as	[]
A) smooth region	B) rough		
C) both a &b	D) none		
7) The line of sight (LOS) distance is the distance trave	elled by thewave.	[]
A) diffracted	B) scattered		
C) reflected	D) direct		
8) The phenomenon of reduction of signal strength du	ie to variation in refractive		
index is called		[]
A) wave tilting	B) fading		
C) diffraction	D) scattering		
9) The E-Layer of Ionosphere exists between		[]
A) 40 to 90 km	B) 90 to 140 km	_	_
C) 140 to 250 km	D) 250 to 400 km		
10) The F2-Layer of Ionosphere exists between		[]
A) 40 to 90 km	B) 90 to 140 km	-	-
C) 140 to 250 km	D) 250 to 400 km		
TRUE OR FALS	E QUESTIONS		
11) Critical frequency is the lowest frequency that ret	urns from Ionosphere at		
vertical frequency.		[]
12) Maximum Usable Frequency (MUF) is the highest	frequency that returns from Ion	osphe	re Other than
vertical frequency.		[]

13) The frequency below which the entire power gets absorbed is referred to	as the Maximu	ım Usable
Frequency (MUF).	[]
14) The frequency at which there is optimum return of wave energy is called	the Optimum F	requency
(OF).	[]
15) Virtual height is always lesser than the Actual height	r	1

- 16) The horizon of the earth, d0 is given by-----
- 17) In ground or surface wave propagation the electric field at the receiving point is given by by......
- 18) In free space the power received is given by Pr=......
- 19) The basic path loss for general communication is given by.....
- 20) The relation between Critical Frequency and MUF is......

Q.NO.	ANSWER
1	С
2	Α
3	В
4	С
5	В
6	Α
7	D
8	В
9	В
10	D

Q.NO.	ANSWER
11	FALSE
12	TRUE
13	FALSE
14	TRUE
15	FALSE

Q.NO.	ANSWER
16	3.57($\sqrt{h_t}$ + $\sqrt{h_r}$)Km
17	$\frac{4\pi \ h_t \ h_r \ E_0}{\lambda d^2}$
18	$P_r = (P_t G_t G_t \lambda^2) / (4\pi R)^2$
19	P _I =32.45+20log ₁₀ f+20log ₁₀ d
20	f _{MUE} =f _c secφ _į