

# IAT3\_MWA

Test will have 25 questions.  
Each question carries 2 marks.

Name \*

HEMALATHA HN

USN \*

1CR17EC070

Section \*

A

B

1. Antenna is defined as: \*

2 points

- A metal which can radiate or receive electromagnetic waves
- A means of radiating and receiving electromagnetic waves
- A structure associated with the region of transition from guided wave propagation and free space propagation and vice versa
- All the above

2. For an antenna to radiate electromagnetic energy, the following conditions must satisfy \*

2 points

- Charges must be accelerated
- current must be time varying
- Both the above conditions
- None of the above

3. To facilitate antenna radiation, antenna structure is: \*

2 points

- Bent
- Curved
- Terminated with a load
- All the above

4. An isotropic antenna \*

2 points

- yields maximum gain
- spherical shaped antenna which is used in antenna analysis
- hypothetical antenna which radiates energy equally in all directions
- has many antenna elements

5. Radiation intensity is \*

2 points

- power radiated by the antenna per unit area
- power radiated by the antenna per unit solid angle
- maximum power radiated by the antenna
- total power radiated by the antenna

6. Poynting vector is \*

2 points

- Power radiated per unit area
- Power radiated per unit solid angle
- maximum power radiated by the antenna
- total power radiated by the antenna

7. Graphical representation of the radiation properties of an antenna as a function of space angles is called \*

2 points

- Half power beam width
- Beam solid angle
- Radiation pattern
- Beam area

8. Half power beam width (HPBW) is \*

2 points

- Angular beam width at the first nulls
- Angular beam width at the half power level
- Angular beam width at the maximum radiation levels
- None of the above

9. An antenna has a field pattern given by  $E(\theta) = [\cos]^2 \theta$  for  $0^\circ \leq \theta \leq 90^\circ$ . Half power beam width (HPBW) of the antenna is \*

2 points

- 33°
- 66°
- 99°
- 122°

10. Which of the following is true for gain and directivity of an antenna: \*

2 points

- Gain is a theoretical quantity
- Directivity is more a realized number
- Gain and directivity are related by  $D=kG$ ,  $k$  is antenna efficiency
- Gain is more a realized number

11. Gain of an antenna is dependent on \*

2 points

- Conduction losses in antenna structure
- impedance matching between antenna input and transmission lines
- dielectric losses in antenna structure
- All the above

12. Following equation depicts the power received by the receiving antenna \*

2 points

- Friis equation
- Rayleigh criterion
- Lorentz equation
- None of the above

13. Point sources are studied because \*

2 points

- they give all details of the radiation pattern
- they offer greater conceptual simplicity and mathematical convenience for analytical study of antennas
- they are having greater aperture efficiency
- None of the above

14. To completely characterize the radiation pattern of point source antenna, following components are needed: \*

2 points

- $S_r$ ,  $E_\theta$  and  $E_\phi$
- $S_\theta$ ,  $E_\theta$  and  $E_\phi$
- $S_\phi$ ,  $E_\theta$  and  $E_\phi$
- None

15. Which of the following is true for antenna arrays \*

2 points

- used to increase the gain of the antennas
- face problems of mutual coupling
- gain increases with increase of number of antennas
- all the above

16. A linear array of isotropic point sources with sources in phase is \*

2 points

- A broadside array
- An end fire array
- Scanning array
- Hansen-Woodyard array

17. Null in a radiation pattern refers to \*

2 points

- No power radiated in that direction
- No field radiated in that direction
- both of the above
- None of the above

18. It is possible to adjust the radiation lobes in any desired direction in case of \*

2 points

- Broadside array
- End-fire array
- Hansen-Woodyard array
- Scanning array

19. The problem observed with end fire array was \*

2 points

- Less directivity
- Less antenna efficiency
- More side lobes
- None of the above

20. Following are the highly desired features of antenna: \*

2 points

- Less side lobe level, sharp beam, more directivity
- Less side lobe level, large beam, more directivity
- More side lobe level, sharp beam, less directivity
- None of the above

21. Antenna efficiency depends on \*

2 points

- Conduction and dielectric losses
- Polarization matching between transmit and receive sides
- impedance matching between antenna and feed
- all the above



22. The path traced by the electric field vector associated with the radiation by an antenna is called \*

2 points

- Aperture
- Polarization
- Bandwidth
- None of the above

23. Eight point sources are spaced  $\lambda/6$  apart. They have a phase difference of  $\pi/3$  between adjacent elements. BWFN in degrees is \*

2 points

- 104.47
- 208.95
- 120
- 240

24. A linear array consists of 4 isotropic point sources. The distance between the adjacent elements is  $\lambda/2$ . The power is applied with equal magnitudes and a phase difference  $-d_r$ . HPBW in degrees is \*

2 points

- 60
- 120
- 150
- 180

25. Which of the following statements is false: \*

2 points

- Sharper beam indicates increased directivity
- spacing between antenna elements of an antenna array is equal
- Gain is directly proportional to directivity
- Effective area of an antenna is different from physical area of the antenna

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