

E 6245



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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S) EXAMINATION, SEPTEMBER 2024

Sixth Semester

Core Course-RADIO AND FIBRE OPTIC COMMUNICATION

(For BS.c. Electronics)

[Prior to 2013 Admissions]

Time : Three Hours

Maximum Weight : 25

Part A

Answer all questions.

*Each bunch of **four** questions carries a weight of 1.*

- I. 1 In Electromagnetic waves, polarization _____.
- (a) Is caused by reflection.
 - (b) Is due to the transverse nature of the waves.
 - (c) Results from the longitudinal nature of the waves.
 - (d) Is always vertical in an isotropic medium.
- 2 _____ defined as the highest frequency that can be used for sky wave communication between two given points on earth.
- (a) Critical frequency.
 - (b) Cut off frequency.
 - (c) Maximum usable frequency.
 - (d) Fixed frequency.
- 3 Fading occurs because of _____.
- (a) Interference between the lower and upper rays of a sky wave.
 - (b) Reflection between the lower and upper rays of a sky wave.
 - (c) Diffraction between the lower and upper rays of a sky wave.
 - (d) All of the above.
- 4 Decrease in strength of signal is known as :
- (a) Tuning.
 - (b) Modulation.
 - (c) Attenuation.
 - (d) Amplification.





- II. 5 A wave of frequency 1 GHz has wavelength of :
- (a) 0.4 m. (b) 0.5 m.
(c) 0.2 m. (d) 0.3 m.
- 6 ————— frequency for a given layer is the highest frequency that will be returned down to earth by that layer after having been beamed straight up at it.
- (a) Critical frequency. (b) Wave frequency.
(c) Maximum usable frequency. (d) Either (a) or (b).
- 7 Microwave frequency range is :
- (a) 5 MHz to 30 MHz. (b) 50 MHz to 300 MHz.
(c) 500MHz to 30000 MHz. (d) 500GHz to 30000 GHz.
- 8 Microwave link repeaters are typically 50 km. apart.
- (a) Because of atmospheric attenuation.
(b) Because of the earth's curvature.
(c) Because of output tube power limitations.
(d) To ensure that the applied dc voltage is not excessive.
- III. 9 Which one of the following antenna is best excited from a wave guide.
- (a) Biconical. (b) Helical.
(c) Horn. (d) Discone.
- 10 The frequency band used by most satellite is —————.
- (a) VHF. (b) UHF.
(c) SHF. (d) EHF.
- 11 The total noise of a satellite earth station receiving system consists of —————.
- (a) Sky noise.
(b) Antenna and feeder noise.
(c) Parametric amplifier Noise.
(d) All of the above.





E 6245

12 In a satellite system :

- (a) Upward link frequency is half of the downward link frequency.
- (b) Upward link frequency is greater than that of the downward link frequency.
- (c) Upward link frequency is less than that of the downward link frequency.
- (d) Upward link frequency is equal to the downward link frequency.

IV. 13 The maximum range of a pulsed radar depends on :

- (a) Pulse duration.
- (b) Pulse energy.
- (c) Pulse peak power.
- (d) Pulse repetition rate.

14 Doppler effect is observed for _____.

- (a) Radial motion only.
- (b) Tangential motion only.
- (c) Both radial as well as tangential motions.
- (d) Neither radial nor tangential motions.

15 The performance characteristics of multimode graded index fibers are :

- (a) Better than multimode step index fibers.
- (b) Same as multimode step index fibers.
- (c) Lesser than multimode step index fibers.
- (d) Negligible.

16 Multimode step index fibers have a bandwidth of :

- (a) 2 to 30 MHz km.
- (b) 6 to 50 MHz km.
- (c) 10 to 40 MHz km.
- (d) 8 to 40 MHz km.

(4 × 1 = 4)

Turn over





E 6245

Part B

*Answer any **five** questions.*

Each question carries a weight of 1.

- 17 Define sky waves.
- 18 What do you mean by critical frequency ?
- 19 Write the characteristics of line of sight over the horizon systems in microwave communications.
- 20 What is orbital spacing ?
- 21 List the various multiple access methods used in satellite communication systems.
- 22 What are the factors which affect the performance of a radar ?
- 23 What do you mean by bending loss of optical fibres.
- 24 Write short notes on WDM.

(5 × 1 = 5)

Part C

*Answer any **four** questions.*

Each question carries a weight of 2.

25. Describe ground wave propagation. What is the angle of tilt ?
26. Write notes on :
 - (a) Virtual height.
 - (b) MUF.
 - (c) Skip distance.
27. Explain about the characteristics and working of any one microwave antenna.
28. Explain about the transponders. What are the main applications of transponders in satellite communication system ?
29. Draw the block diagram of pulsed radar system and explain its working.
30. Differentiate intermodal and intramodal dispersion in optical fibres.

(4 × 2 = 8)





E 6245

Part D

*Answer any **two** questions.*

Each question carries a weight of 4.

31. Explain about the reflection mechanism held in ionosphere. Explain with the help of suitable diagrams.
32. Draw the block diagram of microwave terminal transmitter and receivers. Explain its working in detail.
33. Write notes on :
 - (a) Concept of C band satellite receiving system.
 - (b) Earth station.
 - (c) Path loss.

(2 × 4 = 8)

