**23P406** (Pages: 2) Name: .....

Reg.No: .....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025**

(CBCSS - PG)

(Regular/Supplementary/Improvement)

**CC19P PHY4 E14 - COMMUNICATION ELECTRONICS**

(Physics)

(2019 Admission onwards)

Time : 3 Hours Maximum : 30 Weightage

**Section A**

Answer ***all*** questions. Each question carries 1 weightage.

1. Derive the mathematical equation of PM wave.
2. Compare SNR in AM and FM
3. Briefly discuss the different types of analog pulse modulation.
4. Discuss companding in PCM systems.
5. Differentiate between single side band and independent side band receivers.
6. Explain the properties of convolution.
7. What are the properties of log-periodic antennas?
8. Explain radio horizon and its importance in communication.

**(8 × 1 = 8 Weightage)**

**Section B**

Answer any ***two*** questions. Each question carries 5 weightage.

9. Discuss the theory of amplitude modulation quantitatively .
10. Discuss PCM in detail.
11. Write about AM and television transmitters.
12. Analyze the radiation characteristics of a Hertzian dipole. How will you combine these dipoles to form a short dipole antenna.

**(2 × 5 = 10 Weightage)**

**Section C**

Answer any ***four*** questions. Each question carries 3 weightage.

13. How can synchronous detector used to detect SSBSC and DSBSC?
14. Compare transmission efficiency in normal AM, DSBSC and SSBSC.
15. Write a note about UHF and VHf systems

16. Explain sampling theorem using suitable analog waveform and sampling sequence.

17. Draw the block diagram for the realization of the Discrete time system,
$y(n) = 0.25\ y(n-1) + 0.5\ x(n) + 0.5\ x(n-1)$.

18. What do you mean by Radiation Resistance of an antenna? Calculate the radiation resistance of a half wave dipole.

19. When the maximum electron density of the ionospheric layer corresponds to refractive index of 0.92 at the frequency of 10MHz, find the range if the frequency is MUF itself. The height of the ray reflection point on the ionospheric layer is 400km. Assume flat earth and negligible effect of earth's magnetic field.

**(4 × 3 = 12 Weightage)**

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