



QP CODE: 26019124



26019124

Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc PHYSICS

ELECTIVE - PH800403 - COMMUNICATION SYSTEMS

2019 Admission Onwards

A517DEF8

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Why pulse code modulation is more efficient than other pulse modulation system?
2. What are redundant codes?
3. Draw the schematic diagram of QPSK.
4. Compare the first, second and modern cordless system based on its range.
5. What is the importance of Global System for mobiles(GSM)?
6. In which frequency band are VSATs operated?
7. Optical fibers with low losses and reduced signal dispersion are wavelength dependent. Explain.
8. Define group delay and give its expression.
9. Explain the working of track-while-scan type radar.
10. Why do we need a planar array radar?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Describe some digital modulation system other than PCM.
12. Explain frequency reuse with suitable diagram.





13. Compare the features of Frequency Hopped Multiple Access and Code Division Multiple Access.
14. Briefly explain the frequency bands used for satellite services.
15. The range between a ground station and a satellite is 42,000km. Calculate the free space loss at a frequency of 4 GHz.
16. The material dispersion in an optical fiber defined by $|d^2n_1/d\lambda^2|$ is $4.0 \times 10^{-2} \mu\text{m}^{-2}$. Estimate the pulse broadening per kilometer due to material dispersion within the fiber when it is illuminated with an LED source with a peak wavelength of 0.9 μm and an rms spectral width of 45 nm.
17. Describe, with the aid of suitable diagrams, three common techniques used for the mechanical splicing of optical fibers.
18. Calculate the maximum range of a radar system which operates at 3.5×10^{-12} with a peak pulse power of 850kW. Radar is provided with a target cross sectional area of 10m^2 . It is capable of receiving minimum power of 1×10^{-12} Watt and antenna is having a capture area of 4m^2 .

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight **5** each.

19. Why different multiplexing techniques are needed in communication. Describe any one method?
20. Explain cell splitting, sectoring and microcell zone concept in cellular system.
21. Derive an expression for the acceptance angle for a skew ray which changes direction by an angle 2γ at each reflection in a step index fiber in terms of the fiber numerical aperture and γ .
22. Explain different display methods used in radar system.

(2×5=10 weightage)

