



QP CODE: 24018097



Reg No : .....

Name : .....

**M Sc DEGREE (CSS) EXAMINATION, APRIL 2024**

**Fourth Semester**

M Sc PHYSICS

**Elective - PH800403 - COMMUNICATION SYSTEMS**

2019 ADMISSION ONWARDS

BFC1FEB8

Time: 3 Hours

Weightage: 30

**Part A (Short Answer Questions)**

*Answer any **eight** questions.*

*Weight 1 each.*

1. State the sampling theorem?
2. Explain BCD code with an example.
3. Discuss on phase shift keying.
4. How a cellular systems provide the service-roaming for subscribers?
5. Briefly explain the features of Frequency Hopped Multiple Access .
6. Write an expression for the power received by an antenna.
7. What are the different parts of a conventional optical fiber? Explain.
8. A graded index fiber has a core with a parabolic refractive index profile which has a diameter of 50  $\mu\text{m}$ . The fiber has a numerical aperture of 0.2. Estimate the total number of guided modes propagating in the fiber, when it is operating at a wavelength of 1  $\mu\text{m}$ .
9. Write the expression for noise figure of radar. How it is related to maximum range.
10. What is the significance of a Frequency Modulated CW radar?

(8×1=8 weightage)

**Part B (Short Essay/Problems)**

*Answer any **six** questions.*

*Weight 2 each.*

11. Explain time division multiplexing.





12. Explain any three methods in practical handoff considerations.
13. How the method of microcell one concept is different from cell splitting?
14. Briefly explain Code Division Multiple Access.
15. Write a short discussion about Very Small Aperture Terminal System (VSAT).
16. A step index fiber with a suitably large core diameter for ray theory considerations has core and cladding refractive indices of 1.44 and 1.42 respectively. Calculate the acceptance angle in air for skew rays which change direction by  $150^\circ$  at each reflection.
17. Describe the phenomenon of modal noise in optical fibers and suggest how it may be avoided.
18. Differentiate between search radar and tracking radar.

(6×2=12 weightage)

### **Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight 5 each.*

19. Differentiate PAM, PPM and PWM.
20. Write in detail with the support of diagrams three major interconnected subsystems in GSM architecture.
21. What are Fiber splices? Explain in detail the various techniques involved in mechanical splices.
22. Explain different factors governing pulse characteristics of radar.

(2×5=10 weightage)

