

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2008-09 & thereafter)

SUBJECT CODE : PH/ME/CS24

B.Sc. DEGREE EXAMINATION APRIL 2010
BRANCH III - PHYSICS
SECOND SEMESTER

COURSE : MAJOR – ELECTIVE
PAPER : COMMUNICATION SYSTEMS
TIME : 3 HOURS MAX. MARKS : 100

SECTION – A

ANSWER ALL QUESTIONS: (10 x 3 = 30)

1. Define modulation.
2. Give the principle of pulse width modulation.
3. What are ground waves? Where they are used?
4. Define skip distance.
5. Mention any three uses of radar?
6. Compute the numerical aperture and acceptance angle of a optical fibre.
(refractive index of core $n_1 = 1.55$, refractive index of cladding $n_2 = 1.50$ & surrounding medium(air) $n_0 = 0$)
7. Differentiate the step index fibre from graded index fibre.
8. What are geostationary satellites?
9. Write short notes on mobile communication.
10. What do you mean by the Ionosphere?

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5 x 6 = 30)

11. What is phase modulation? Obtain an expression for a phase modulated wave when the modulating signal is sinusoidal.
12. Distinguish between amplitude modulation and frequency modulation.
13. What are sky waves? “Sky wave reception is better at night than at day” why?
14. With the neat block diagram, explain the operation of pulsed radar system.

15. Derive an expression for numerical aperture and acceptance angle in optical fibre.
16. Discuss the factors which affect the transmission of light waves in optic fibres.
17. Describe the working of a LCD.

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2 x 20 = 40)

18. (a) Show that an amplitude modulated wave can be represented by a carrier and two side frequencies for each modulation frequency.
(b) What are sidebands of amplitude modulation waves? How can you find the bandwidth from the sidebands? (12+5+3)
19. (a) Explain the basic principles of the radar system.
(b) Derive the radar range equation and discuss how the maximum range covered by a radar can be increased. (5+15)
20. (a) Draw the block diagram of fibre optic communication system and explain their function.
(b) Discuss the applications of optic fibre technology. (4+10+6)
21. Explain with a neat diagram, the operation of the image orthicon TV camera.

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