

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

SUBJECT CODE : PH/ME/CS25

**B.Sc. DEGREE EXAMINATION APRIL 2009**  
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. Mention the advantages of frequency modulation over amplitude modulation.
2. Give the principle of pulse amplitude modulation.
3. Explain sky wave propagation.
4. Define critical frequency.
5. Mention the uses of radar.
6. Write a note on reflex klystron.
7. Explain what is graded index fibre.
8. Give the structure of a practical optical fibre.
9. What is LCD? Mention the types of LCD.
10. Write a note on networking.

**SECTION – B**

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

11. Explain amplitude modulation and derive voltage equation of an AM wave.  
(2 + 4)
12. A frequency modulated voltage wave is given by the equation  
 $e = 12 \cos(6 \times 10^8 t + 5 \sin 1250 t)$  Find (i) carrier frequency (ii) signal frequency  
(iii) modulation index (iv) maximum frequency deviation (v) power dissipated by  
the FM wave in 10 ohm resistor. (6)

13. What is ionosphere? Show how the electron density in the ionosphere varies with height. (2 + 4)
14. With a block diagram explain Radar system. (2 + 4)
15. In an optical fibre the core material has refractive index 1.6 and refractive index of clad material is 1.3. What is the value of critical angle? Also calculate the value of angle of acceptance cone. (3 + 3)
16. Discuss different types of attenuation losses. (6)
17. Describe a television camera with a diagram and explain its working. (2 + 4)

**SECTION – C**

ANSWER ANY TWO QUESTIONS: (2 x 20 = 40)

18. With a neat diagram explain the construction and working of magnetron oscillator. (4 + 8 + 8)
19. With a block diagram explain fibre optic communication system and discuss the advantages. (2 + 10 + 8)
20. With the block diagram describe various stages of a satellite communication system. What are the advantages of satellite communication system over other communication systems. (4 + 10 + 8)
21. a) Explain the construction and working of klystron oscillator (5 + 5)  
b) Discuss the effect of ionosphere on radio waves (10)

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