

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.  
(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/MO/CS64**

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

COURSE : **MAJOR – OPTIONAL**  
PAPER : **COMMUNICATION SYSTEMS**  
TIME : **3 HOURS**

MAX. MARKS : 100

**SECTION – A**

**ANSWER ALL QUESTIONS:**

**(10 x 3 = 30)**

1. Define modulation factor and give its expression.
2. State the principle of radar with a neat block diagram of elementary pulsed radar.
3. What is meant by Image lag in a camera tube?
4. Define the terms primary and complimentary colours.
5. Define pulse modulation and Compare it with frequency modulation.
6. Define skip distance.
7. At 20km in free space from a point source the power density is 200micro W/m<sup>2</sup>.  
What is the power density 25km away from this source?
8. State why magnetron is called as cross field device. Also define strapping.
9. Define attenuation in optical fibres and give its expression.
10. List any three applications of integrated optic fibre technology.

**SECTION – B**

**ANSWER ANY SIX QUESTIONS:**

**(5 X 6 = 30)**

11. With neat sketches (graphs) define amplitude and frequency modulations. Also list any three comparisons between them.
12. Derive Radar range equation.
13. With neat diagrams give a detailed report of interlaced scanning.
14. Explain mixing of colours.
15. Explain how sky waves are used for propagation.

16. With neat sketch explain the principle and working of multicavity klystron.
17. Give a detailed note on fibre losses and absorption losses.
18. Explain with neat diagram how light is propagated in optic fibre technology.

### SECTION – C

**ANSWER ANY TWO QUESTIONS:**

**(2 X 20 =40)**

19. (a). Discuss in detail the frequency spectrum of AM wave.  
(b). Derive the modulation index and power relations in AM wave.  
(c). A 400W carrier is modulated to a depth of 75%. Calculate the total power in a modulated wave. (7+8+5)
20. Explain with block diagrams the working of TV transmitter and receiver.
21. Explain how microwaves are generated using Magnetron Oscillator.
22. (a). Explain in detail the classification of optical fibres.  
(b). List the comparison between single mode step index and multimode step index fibre . (12+8)

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