

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086**  
**(For candidates admitted from the academic year 2023 – 2024 & thereafter)**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**  
**BRANCH III - PHYSICS**  
**FOURTH SEMESTER**

**COURSE : MAJOR ELECTIVE**  
**PAPER : COMMUNICATION SYSTEMS**  
**SUBJECT CODE : 23PH/ME/CS45**  
**TIME : 3 HOURS**

**MAX. MARKS: 100**

Q. No.	SECTION A Answer ALL questions (10 x 2 = 20 marks)	CO	KL
1.	What is modulation?	1	1
2.	Write the principle of pulse amplitude modulation.	1	1
3.	Write a brief note on ground waves.	1	1
4.	Explain Doppler effect.	1	1
5.	Highlight the importance of microwave communication.	1	1
6.	What is meant by Skip distance?	1	1
7.	What is total internal reflection?	1	1
8.	What is attenuation in optical fibres?	1	1
9.	Give any two advantages of 3G network.	1	1
10.	What are advantages of wireless communications?	1	1
Q. No.	SECTION B-I Answer any FOUR questions (4 x 5 = 20 marks)	CO	KL
11.	Draw the waveform of AM wave for the following values of modulation factor: (i) 0                      (ii) 0.5                      (iii) 1                      (iv) 1.5	2	2
12.	With a diagram, explain tropospheric scatter propagation.	2	2
13.	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.	2	2
14.	With a block diagram explain the Radar system.	2	2
15.	Explain the process in making a call, in mobile communication.	2	2
Q. No.	SECTION B-II Answer ANY FOUR questions (4 x 5 = 20 marks)	CO	KL
16.	Explain how sky and space wave are used for propagation.	3	3

17.	A 25 MHz carrier is modulated by a 400 Hz audio sine wave. If the carrier voltage is 4V and the maximum frequency deviation is 10KHz, write down the voltage equation of the FM wave.	3	3
18.	Enumerate the uses of RADAR.	3	3
19.	Describe with a block diagram the working principle of optical fiber communication.	3	3
20.	Distinguish TDMA and CDMA standards.	3	3
<b>Q. No.</b>	<b>SECTION C-I (2 x 10 = 20 marks)</b> <b>Answer ANY TWO questions</b>	<b>CO</b>	<b>KL</b>
21.	Explain the stratification in ionosphere during day time.	4	4
22.	Derive the RADAR range equation.	4	4
23.	Describe the construction and working of magnetron oscillator.	4	4
24.	Write short note on basic structure of optical fibre and explain the propagation of light through the optical fibre.	4	4
<b>Q. No.</b>	<b>SECTION C-II (2 x 10 = 20 marks)</b> <b>Answer ANY TWO questions</b>	<b>CO</b>	<b>KL</b>
25.	Derive an expression for amplitude modulated wave and explain the significance of side band frequencies in AM wave.	5	5
26.	What are microwaves? Explain the advantage of increased bandwidth in microwaves.	5	5
27.	With suitable diagram explain, meridional and skew ray.	5	5
28.	Compare the various features and advantages of 0G, 1G, 2G, 3G and 4G networks.	5	5

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