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KAMALA INSTITUTE OF TECHNOLOGY & SCIENCE, SINGAPUR
23EC28PC403

II.B. Tech. II. Semester Regular/Supplementary Examinations, April/May- 2026
ANALOG AND DIGITAL COMMUNICATIONS
(ECE)

Time: 3 Hours

Max. Marks: 60

Note: Question paper consists of Part-A & Part-B.

i) **Part-A** for 10M, ii) **Part-B** for 50marks

- Part A** is compulsory, consisting of 10 sub questions from all units carrying equal marks.
- Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A (10Marks)			
Q. No	Questions	Marks	BTL
1.a)	Define Modulation	1M	1
1.b)	The total power of and AM Signal is 40kW of 60% modulation, determine the carrier power and power in each side band.	1M	3
1.c)	Outline the Carson's rule of FM bandwidth.	1M	1
1.d)	What is Pre -emphasis and De-emphasis?	1M	1
1.e)	Distinguish between high level and low-level AM transmitters.	1M	2
1.f)	List the receiver characteristics	1M	1
1.g)	Define Quantization?	1M	1
1.h)	Contrast between DPCM and DM	1M	4
1.i)	Define probability of error (Pe)	1M	1
1.j)	Difference between PSK and QPSK.	1M	2
PART-B (50Marks)			
Q.No	Questions	Marks	BTL
2. a)	Derive an Expression for the total transmitted power in the AM wave. Also obtain its efficiency.	5M	5
b)	Describe generation of DSB-SC signal.	5M	4
OR			
3. a)	The equation of amplitude wave is given by $s(t)=20[1+0.8\cos(2\pi\times103t)] \cos(4\pi\times105t)$. Find the carrier power, the total sideband power, and the band width of AM wave.	5M	3
b)	Explain AM Demodulation with Envelope detector	5M	2
OR			
4. a)	What is the Direct Method of FM Generation Technique? Explain in detail?	5M	2
b)	Interpret the mathematical expression for NBFM and compare the Frequency spectrum with AM.	5M	3
OR			
5. a)	Illustrate the expression for a single tone FM signal in terms of	5M	3

	Bessel function $J_n(\beta)$. Hence, obtain the spectrum of FM signal		
b)	Describe the balanced slope detection of FM demodulation?	5M	4
6. a)	Explain the working principle of TRF receiver.	5M	2
b)	Describe the operation of an FM receiver and illustrate it with a block diagram	5M	4
OR			
7. a)	Draw the Block diagram of Super-heterodyne receiver designed to receive FM signals and explain its working	5M	2
b)	Distinguish between high level and low-level AM transmitters	5M	3
8. a)	Describe Pulse Amplitude Modulation (PAM) with its generation and detection	5M	4
b)	Explain the block diagram of Delta modulation system also (derive the expression for overall SNR of DM)	5M	2
OR			
9. a)	Compare Frequency Division Multiplexing (FDM) and Time Division Multiplexing (TDM) in detail	5M	4
b)	Draw the block diagram of a PCM System; explain the functions of each block.	5M	2
10.a)	Describe the working of a non-coherent FSK detector	5M	2
b)	Describe the working of a coherent ASK detector with diagram.	5M	2
OR			
11.a)	Explain the concept of an optimum receiver in Additive White Gaussian Noise (AWGN) channels.	5M	2
b)	Derive the expression for probability of error in BPSK	5M	3

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