

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)**

CLASS: BTECH  
BRANCH: ECE

SEMESTER: IV  
SESSION: SP/2020

**SUBJECT: EC255 ANALOG COMMUNICATION**

TIME: 2 HOURS

FULL MARKS: 25

**INSTRUCTIONS:**

1. The total marks of the questions are 25.
  2. Candidates may attempt for all 25 marks.
  3. Before attempting the question paper, be sure that you have got the correct question paper.
  4. The missing data, if any, may be assumed suitably.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q1 (a)	Briefly explain Modulation and its types? Write the advantages and disadvantages of SSB over Conventional AM or AMDSB-SC.	[2] CO2	2
Q1 (b)	Explain the principles of Amplitude Modulator Circuits. How amplitude modulator Circuit can be designed using diode?	[3] CO2	2
Q2 (a)	Why Multiplexing is required in Communication System? Draw the block diagram of FDM system.	[2] CO2	1
Q2 (b)	Explain the concept of Coherent detection. How is it useful to demodulate the AMDSB-SC wave?	[3] CO2	4
Q3 (a)	Explain the working principle of Balanced Modulator using diode.	[2] CO2	4
Q3 (b)	Show that for distortion less transmission the impulse response of the linear phase system is symmetrical about its delay parameter ( $t_d$ ).	[3] CO1	3
Q4 (a)	What is essential bandwidth? How one can estimate the essential bandwidth of any given signal?	[2] CO1	2
Q4 (b)	Find the Fourier transform of the Gaussian Signal $x(t) = e^{-\alpha t^2}$ and Gaussian Modulated Signal $x(t) = e^{-\alpha t^2} \cos(\omega_c t)$ . Plot the time domain signal as well as its frequency spectrum.	[3] CO1	3
Q5 (a)	Why Hilbert transform? List out the properties of Hilbert Transform.	[2] CO1	1
Q5 (b)	The signal $x(t) = \cos^2(5000\pi t) \sin(2000\pi t)$ is transmitted through a telephone system which blocks dc and frequencies above 14 kHz, compute the ratio of received power to transmitted power.	[3] CO1	3

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