

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)
II B.Tech II Semester (SVEC-16) Regular Examinations May - 2018
ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours

Max. Marks: 70

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

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|-------------|---|-----|---------|
| 1 | a) A carrier signal $c(t)=6\cos(60000\pi t)$ is amplitude modulated with a modulating signal $m(t)=3\cos(1800\pi t)$. Calculate the transmitted power for each of the following cases and comment on the results:
i) If the modulating signals voltage is doubled.
ii) If the carrier signals voltage is doubled.
iii) If the modulating signals frequency is doubled.
iv) If the carrier signal is removed from the transmitted signal. | CO4 | 8 Marks |
| | b) Compare AM, DSB-SC and SSB-SC modulation schemes. | CO1 | 6 Marks |
| (OR) | | | |
| 2 | a) A 500 KHz carrier signal of peak amplitude 10V is amplitude modulated with a modulating signal of peak amplitude 2V and 5KHz frequency.
i) Derive the expression for modulated wave in time domain and frequency domain.
ii) Find the maximum and minimum values of the envelope. From these values find the modulation index and efficiency. | CO4 | 8 Marks |
| | b) Discuss in detail about Frequency Division Multiplexing with neat diagram. | CO1 | 6 Marks |

UNIT-II

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|-------------|---|-----|---------|
| 3 | a) Justify how a NBFM signal is equal to AM signal. | CO1 | 5 Marks |
| | b) A device with input $x(t)$ and output $y(t)$ is characterized by: $y(t) = x^2(t)$. An FM signal with frequency deviation of 100KHz and modulating signal bandwidth of 10KHz is applied to this device. Find the bandwidth of the output signal. | CO4 | 9 Marks |
| (OR) | | | |
| 4 | a) Consider the FM signal $S(t) = 20\cos [4\pi 10^6 t + 10\sin (4\pi 10^3 t)]$.
i) Calculate frequency deviation, bandwidth and power.
ii) Calculate above quantities when the message signal amplitude is doubled. | CO4 | 6 Marks |
| | b) Discuss how PLL is useful in extracting message signal from FM signal. | CO1 | 4 Marks |
| | c) Discuss about transmission bandwidths of FM signal. | CO5 | 4 Marks |

UNIT-III

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|-------------|---|-----|----------|
| 5 | Estimate Signal to Noise ratio of an amplitude modulation system. | CO2 | 14 Marks |
| (OR) | | | |
| 6 | Estimate Signal to Noise ratio of an angle modulation system. | CO2 | 14 Marks |

UNIT-IV

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|-------------|--|-----|---------|
| 7 | a) Compare AM and FM receivers in detailed manner. | CO3 | 7 Marks |
| | b) Discuss about Tuned Radio Frequency Receiver with neat block diagram. | CO3 | 7 Marks |
| (OR) | | | |
| 8 | a) A Super heterodyne receiver having RF amplifier is tuned to 1200KHz. Determine the image frequency of the receiver. | CO5 | 3 Marks |
| | b) Discuss about Amplitude limiting in FM receiver. | CO6 | 5 Marks |
| | c) Discuss about super heterodyne FM receiver with neat block diagram. | CO3 | 6 Marks |

UNIT-V

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|-------------|----|--|-----|---------|
| 9 | a) | Compare PAM, PWM and PPM modulation schemes. | CO1 | 6 Marks |
| | b) | Explain the generation and detection of PWM signal. | CO1 | 8 Marks |
| (OR) | | | | |
| 10 | a) | Two signals are band limited to 3KHz and 5KHz are to be time division multiplexed. Find the maximum permissible interval between two successive samples. | CO1 | 4 Marks |
| | b) | Discuss on bandwidth requirement for transmission of PAM signals. | CO2 | 5 Marks |
| | c) | Discuss how a message signal is extracted from a PAM signal. | CO1 | 5 Marks |

