

Duration: 3hrs

[Max Marks:80]

- N.B. :** (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]  
a Draw the block diagram of analog communication system and explain its working in brief.  
b Compare amplitude modulation and frequency modulation.  
c Explain the concept of pre-emphasis and de-emphasis in FM.  
d Compare PAM, PWM, PPM  
e What are the various factors considered in selection of IF in super heterodyne receivers?
- 2 a An AM signal produced by modulating a carrier signal of 10 MHz frequency and with a modulating signal of 10 KHz. Compute sideband frequencies, bandwidth and plot the frequency domain representation by assuming the 50% modulation and peak amplitudes of message and carrier signal as 3V and 15V respectively. [10]  
b Explain the generation and detection of PPM signal? [10]
- 3 a Explain the working of Ratio detector with the relevant diagrams. How is it better than balanced slope detector? [10]  
b What is the need of multiplexing? Explain the Time division multiplexing in detail along with its applications. [10]
- 4 a Explain the working of indirect FM transmitter. State its advantages [10]  
b Define Friis formula. Calculate the overall noise figure of the system using Friis formula [10] for the three amplifier cascade stages with following specifications.  
Amplifier 1:  $G_1= 10, F_1= 12$   
Amplifier 2:  $G_2= 20, F_2= 15$   
Amplifier 3:  $G_3= 30, F_3= 100$
- 5 a Explain the working of diode detector as AM demodulator. How is practical diode detector different from diode detector? [10]  
b What are the various methods of generating FM? Explain the working of varactor diode modulator with required diagrams. [10]
- 6 a Explain the working of superheterodyne receiver in detail. [10]  
b State and prove sampling theorem. State the consequences of not satisfying Nyquist criteria in sampling [10]

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