Q.32 Draw and explain the principle working of FSK system. (CO4)

Q.33 Carrier wave of frequency f=1mHz with pack voltage of 20V used to modulate a signal of frequency 1kHz with pack voltage of 10v. Find out the following (CO6)

i) Modulation index (μ)
ii) Frequencies of the modulated wave
iii) Bandwidth

Q.34 Draw and explain the ASK, FSK and PSK waveform for binary sequence 1011001. (CO6)

Q.35 Differentiate between open loop and close loop control system. (CO4)

## SECTION-D

**Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 What is a controller? Explain PI controller with block diagram. (CO5)

Q.37 Write short notes on:

a) Compare ASK, FSK and PSK. (CO6)
b) Spread spectrum techniques. (CO6)

Q.38 Write the comparison between DSB-FC, DSB-SC and SSB system of modulation. (CO5)

(**Note:** Course outcome/CO is for office use only)



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202453/122453

**5th Sem / Branch : Mechatronics**
**Subject:- Process Control & Data Communication**

Time : 3Hrs. M.M. : 100

## SECTION-A

**Note:** Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 A temperature control system is known as: (CO1)

a) Process control system
b) Servomechanism
c) Cascade control system
d) None of these

Q.2 The term hysteresis is associated with: (CO2)

a) ON-OFF control
b) P-I control
c) Feed-forward control
d) Ratio control

Q.3 A major part of the automatic control theory applies to the: (CO3)

a) Casual systems
b) Linear Time invariant systems
c) Time variant systems
d) Non-linear system

Q.4 Traffic light system is the example of: (CO3)

a) Open-loop system b) Closed-loop system
c) Both (a) and (b) d) None of these

Q.5 The most powerful controller is: (CO4)

a) PD controller b) PI controller
c) PID controller d) None of these

Q.6 In an AM wave, the majority of the power is in _____. (CO2)

a) Lower sideband b) Upper sideband
c) Carrier d) None of these

Q.7 The major advantage of FM over AM is ____. (CO3)

a) Reception is less noisy
b) Higher carrier frequency
c) Smaller bandwidth
d) Small frequency deviation

Q.8 As the modulation level is increased, the carrier power _____ (CO4)

a) is increased b) remains the same
c) is decreased d) None of these

Q.9 Frequency range of HF band is _____ (CO2)

a) 30-300 MHz b) 30-300KHz
c) 300-3000KHz d) 3-30 Mhz

Q.10 Which of the following are the advantages of sideband modulation? (CO3)

a) High power signal b) Low power signal
c) Less noise d) Both a and c

## SECTION-B

**Note:** Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define discrete time control system. (CO-1)
Q.12 Draw a unit step signal. (CO2)
Q.13 Define control valve. (CO3)
Q.14 Define controlled variable. (CO3)
Q.15 Expand PID. (CO2)
Q.16 A ring modulator is used in generation of ___. (CO4)



Q.17 In radio transmission, the medium of transmission is _____ (CO4)
Q.18 If a radio receiver amplifies all the signal frequencies equally well, it is said to have high _____ (CO5)
Q.19 _____ shift keying is mostly preferred for telegraphy. (CO6)
Q.20 Which is called as on-off keying? (CO4)

## SECTION-C

**Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Differentiate between time varying and time in variant systems. (CO1)
Q.22 Draw and explain the elements of closed loop system. (CO2)
Q.23 What do you mean by process control? Explain its working. (CO3)
Q.24 What is the On-Off controller? (CO4)
Q.25 Draw and explain diaphragm operated valve. (CO5)
Q.26 Explain control valve characteristics. (CO6)
Q.27 Explain electromagnetic spectrum and its various ranges. (CO4)
Q.28 Define the term modulation index. Explain the formula of modulation index for amplitude modulation. (CO4)
Q.29 Compare AM, FM and PM. (CO5)
Q.30 Define digital modulation. What are the advantages and disadvantages of digital modulation .(CO5)
Q.31 Draw the waveform for Am. Explain the expression for power in AM. (CO4)