

2103000205030063
EXAMINATION FEBRUARY-MARCH 2024
BACHELOR OF SCIENCE (FIFTH SEMESTER)
PHYSICS - ELECTIVE PAPER - I
MODERN DIGITAL AND ANALOG COMMUNICATION
SYSTEM-I - LEVEL 3

[Time: As Per Schedule]

[Max. Marks: 50]

Instructions:

1. Fill up strictly the following details on your answer book

- a. Name of the Examination: **BACHELOR OF SCIENCE (FIFTH SEMESTER)**
 - b. Name of the Subject: **PHYSICS – ELECTIVE PAPER –I MODERN DIGITAL AND ANALOG COMMUNICATION SYSTEM-I – LEVEL 3**
 - c. Subject Code No: **2103000205030063**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 Write answer in brief.

1*10=10

1. PLL stands for?
2. PSK stands for...
3. FSK stands for....
4. PSD stands for.....
5. What is noise amplification?
6. Full form of MMSE method.
7. CON stands for
8. What is the full form of ASK.....
9. Full form of ISI
10. Full form of ISDN.....

Q.2 (A) Write any one of the following.

- a. Draw a block diagram of a communication system and explain it briefly. **7**
- b. State the sampling theorem explain analogue to digital conversion of a signal. **7**

(B) Write any one of the following.

- a. Write a short note on noise immunity of Digital signal. **3**
- b. Write short note on pulse code modulation. **3**

Q.3 (A) Write any one of the following.

- a. Explain generation of SSB signal using the phase shift method. Also draw necessary circuit diagram **7**
- b. Explain Double side amplitude Modulation. **7**

(B) Write any one of the following.

- a. Write short note on rectifier detector. **3**
- b. Write short note on envelop detector. **3**

Q.4 (A) Write any one of the following.

- a. Write a short note on the concept of instantaneous frequency. **7**
- b. What is angle modulation? Explain narrow band angle modulation approximation. **7**

(B) Write any one of the following.

- a. Explain relationship between FM and pm with necessary block diagram. **3**
- b. A signal $m(t)=50 \sin^2(5000 \pi t)$ frequency modulates a carrier the modulation sensitivity constant K_f is 3000π . Calculate the transmission bandwidth of the modulated signal. **3**

Q.5 (A) Write any one of the following.

- a. State sampling theorem and explain it **7**
- b. Draw the block diagram of PCL system and give explanation of each block. **7**

(B) Write any one of the following.

- a. A signal $m(t)$ band-limited to 3kHz is sampled a rate 33.33% higher than the Nyquist rate the maximum acceptable error in the sampled amplitude (the maximum quantization error) is 0.5% of the peak amplitude m_p . The quantized samples are binary coded. Find the minimum bandwidth of a channel required to transmit the encoded binary signal. If 24 such signals are time division multiplexed, determine the minimum transmission bandwidth required to transmit the multiplexed signal. **3**
- b. Write a short note on application of the sampling theorem. **3**
