PURBANCHAL UNIVERSITY
2022

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer FIVE questions. **5×16=80**

1(a) Define communication process. Draw and explain the basic blocks of Analog communication system. 2+6

(b) Define noise. Explain about various types of noise encountered in communication system. 2+6

2(a) Explain the synchronous detection method for the demodulation of DSB-AM signal. 8

(b) An AM transmitter radiates 10 KW of power when the carrier is unmodulated and 12.65 KW when the carrier is sinusoidally modulated. Find the modulation index, percent modulation. Now if another sinewave corresponding to 40% modulation is transmitted simultaneously, then calculate the total radiated power. 8

3(a) Explain Armstrong method for the generation of FM signal. 8

(b) A single tone FM signal is given by $U_{FM}(t)=10\sin(10^3t+3\sin10^4t)$. calculate the carrier and modulating frequencies, modulation index, frequency deviation and power dissipated in 100Ω resistor. 8

4(a) Draw and explain PCM system. Compare it with DM system. 6+2

(b) Explain about FDM in telephony. 8

5(a) Explain about ASK transmission and reception system. 8

(b) With the help of diagram explain about GSM architecture. 8

Contd. ...

6. Write short notes on any FOUR: 4×4

(a) Parseval's theorem

(b) PLL

(c) Shannon channel theorem

(d) Need for Modulation

(e) ISI

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Time: 03:00
BEG232EC

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(b) With the help of diagram explain about GSM architecture. 8

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6. Write short notes on any FOUR:

(a) Parseval's theorem

(b) PLL

(c) Shannon channel theorem

(d) Need for Modulation

(e) ISI

PURBANCHAL UNIVERSITY
2021

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

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Answer EIGHT questions. **8×10=80**

1(a) Draw the general block diagram of analog communication system. Explain each block briefly. 8

(b) What is energy signal? 2

2(a) Define modulation. What are its types? 3

(b) Explain envelop detection method of AM signal with necessary figure. 7

3. Explain about stereo FM transmission and reception with necessary figures. 10

4(a) A single tone FM signal is given by 7

$S_{FM}(t)=10\sin(10^8t+3\sin10^4t)$

Calculate the carrier and modulating frequencies, modulation index, frequency deviation and power dissipated in 100 ohm resistor.

(b) Define shift keying and its types. 3

5. What is multiplexing? Explain about FDM and TDM with necessary figures. 10

6(a) Explain about PCM system with block diagram. 5

(b) Represent the following digital data in unipoloar, polar, bipolar and Manchester format: 11010110. 5

7. How can you demodulate AM signal? Explain any one method in detail with necessary diagrams. 10

8. Draw and explain in detail about GSM system architecture. 10

Contd. ...

9. Write short notes on any TWO: 2×5=10

(a) Satellite communication

(b) Shannon channel capacity theorem

(c) Noise and its types

PURBANCHAL UNIVERSITY
2016

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions. **5×16=80**

1(a) Describe the general communication system with the help of block diagram. 6

(b) Derive the Parseval's theorem for energy signal. 4

2(a) Explain the various types of noise that occur in communication system. 5

(b) Why modulation is required for signal transmission? 5

3(a) Explain the detection procedure for DSB-SC. 5

(b) Describe how FM wave can be generated from PM wave and vice versa. 5

4(a) Define the Carson's role for FM bandwidth. An FM wave modulated to a depth of 8, generates a BW of 180KHz. Find the frequency deviation. 5

(b) How does PPL work? Explain with necessary figures. 5

5(a) A carrier signal $c(t) = 10 \cos 2\pi \times 10^6 t$ is amplitude modulation by modulating signal $m(t) = 5 \cos 2\pi \times 10^2 t$. Find modulation index, percentage modulation, required bandwidth and transmission power of resultant AM wave. 5

(b) Discuss the advantages and disadvantages of digital communication system over analog communication system. 5

6(a) State and explain the sampling theorem. Describe aliasing effect. 5

(b) Explain T1 hierarchy in digital telephony in detail. 5

Contd. ...

7(a) Explain about GSM architecture with necessary diagram 7

(b) What are the advantages of optical fiber communication? 3

8(a) Explain the detail about PCM. 5

(b) Define information theory and explain different types of line coding schemes. 5

9. Write short notes on any FOUR: 2×5=10

(a) Threshold effect in AM

(b) FDM

PURBANCHAL UNIVERSITY
2019

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions. **8×10=80**

1(a) Draw the general block of communication system and explain each block in brief. 7

(b) Define and discuss the importance of modulation index in AM. 3

2(a) Explain synchronous demodulation of DSB-SC signal with necessary figures. 7

(b) Compare energy signal and power signal. 3

3. Describe about super heterodyne receiver for standard AM radio with necessary figures in detail. 10

4(a) Given the modulating signal m(t)=5 Cos 200πt and carrier signal c(t) = 10 Cos 5000πt. if these two signals are amplitude modulated then find:

(i) Modulation index 6

(ii) Expression for AM vave

(iii) Lower side frequency and upper side frequency.

(iv) Bandwidth

(b) Why companding is done in PCM? Describe. 4

5(a) Differentiate between ASK and FSK signals. 4

(b) A 107.6 MHZ carrier signal is frequency modulated by a 7KHZ sine wave. The resultant FM signal has a frequency deviation of 50KHZ. Determine: 6

(i) Carrier swing of FM signal.

(ii) Highest and lowest frequencies attained by the modulated signal.

(iii) Modulation index of FM wave.

6(a) What is cellular system? Describe it with necessary figures. 5

Contd. ...

(b) What do you mean by FDM in telephony? Explain its hierarchy. 5

7(a) Define shannon's channel capacity Theorem and explain its limitations. 7

(b) How FM can be generated from PM? Explain. 3

8. Explain limiter-discrimination method in detail for the detection of FM signal with necessary figures. 10

9. Write short notes on any TWO: 2×5=10

(a) Satellite communication system

(b) External noise

(c) Nyquist sampling theorem

PURBANCHAL UNIVERSITY
2019

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

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All questions carry equal marks.

Answer EIGHT questions. **8×10=80**

1(a) Draw the general block of communication system and explain each block in brief. 7

(b) Define and discuss the importance of modulation index in AM. 3

2(a) Explain synchronous demodulation of DSB-SC signal with necessary figures. 7

(b) Compare energy signal and power signal. 3

3. Describe about super heterodyne receiver for standard AM radio with necessary figures in detail. 10

4(a) Given the modulating signal m(t)=5 Cos 200πt and carrier signal c(t) = 10 Cos 5000πt. if these two signals are amplitude modulated then find:

(i) Modulation index 6

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(iii) Lower side frequency and upper side frequency.

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(b) A 107.6 MHZ carrier signal is frequency modulated by a 7KHZ sine wave. The resultant FM signal has a frequency deviation of 50KHZ. Determine: 6

(i) Carrier swing of FM signal.

(ii) Highest and lowest frequencies attained by the modulated signal.

(iii) Modulation index of FM wave.

6(a) What is cellular system? Describe it with necessary figures. 5

Contd. ...

PURBANCHAL UNIVERSITY
2018

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions. **8×10=80**

1. What is power signal? Prove the Parseval's Theorem for power signal. 2+8

2(a) Draw block diagram of analog communication system. Explain each block briefly. 4+4

(b) Define modulation. 2

3. A carrier signal $c(t)=20\cos 2\pi \times 10^2$ V is amplitude modulated by by a modulating signal $m(t)=6\cos 2\pi \times 10^8$ V. Find modulation index, percent of modulation, required bandwidth and transmission power of the resultant AM wave. 2.5+2.5+2.5+2.5.

4. Explain about methods of generation of FM signal with block diagram. 10

5. An FM signal is represented by the following: 2+2+2+2+2

$S(t)=10\text{Cos}(2\pi \times 10^6 t+5\ \text{Sin}2\pi \times 10^3 t)$. Calculate:

(i) Carrier frequency

(ii) Message frequency

(iii) Production index

(iv) Frequency deviation

(v) Power dissipated in 100Ω resistor

6. Explain about PCM system with block diagram. 10

7. Represent the following data in unipolar, polar bipolar & Manchester format: 2.5+2.5+2.5+2.5

10010011

Contd. ...

8(a) What do you mean by multiplexing? Explain about FDM with diagram. 2+6

(b) State Carlson's rule for FM wave. 2

9. Write short notes on any TWO: 2×5=10

(a) Need of modulation

(b) DBS-SC modulation

(c) Optical fiber communication

PURBANCHAL UNIVERSITY
2017

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions. **8×10=80**

1. What is energy signal and power signal? State and prove the energy Parseval's theorem. 10

2(a) A carrier signal $c(t)=10\cos 2\pi \times 10^3 t$ V is amplitude modulated by by a modulating signal $m(t)=6\cos 2\pi \times 10^7 t$ v. Find modulation index, percent of modulation, required bandwidth and transmission power of the resultant AM wave. 6

(b) What are need for modulation? Explain briefly. 4

3(a) Derive the expression for time domain representation of single tone modulated FM. 4

(b) A signal tone FM is represented by the voltage equation. 2+2+2

$v(t) = 12 \cos (6\times 10^8 t + 5 \sin 1250t)$.

Determine the following:

(i) carrier frequency (ii) modulating frequency

(iii) modulation index

4(a) Define ASK, PSK, FSK. Explain each briefly. 8

(b) State Carlson's rule for FM wave. 2

5. Draw the general block diagram of a digital communication system and explain each block in detail. 10

6(a) Explain pulse code modulation. 6

(b) State and prove Nyquist sampling theorem. 4

7(a) Explain about Shannon's channel capacity theorem. 5

(b) What do you mean by multiplexing? Explain about TDM and FDM. 5

Contd. ...

8(a) Explain single side band modulation with necessary diagram. 6

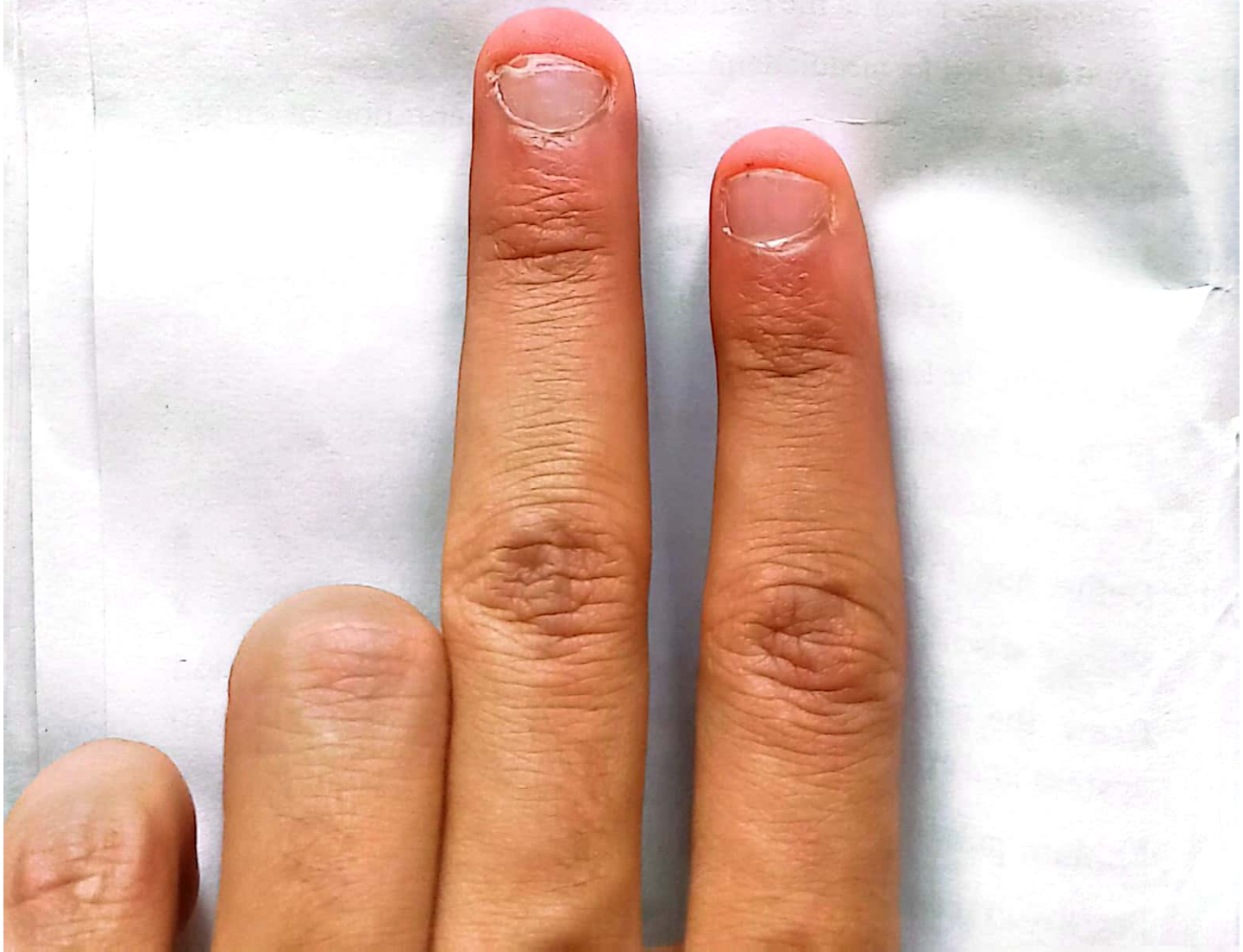
(b) What do you mean by ISI? 4

9. Write short notes on any TWO: 2×5=10

(a) PAM

(b) Optical fiber communication

(c) Vestigeal side band modulation



PURBANCHAL UNIVERSITY
2015

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer FIVE questions. **5×16 = 80**

1(a)	Draw the general block diagram for digital communication system and explain each block in brief.	7
(b)	State and explain Parserval's Theorem for power signals.	5
(c)	Explain the need for modulation	4
2(a)	Explain square law detection method for DSB-AM signals.	6
(b)	The total power content of an AM signal is 1000W. Determine the power being transmitted at the carrier frequency and at each of the sidebands when the percent modulation is 100%.	6.
(c)	Compare NBFM and WBFM.	4
3(a)	Explain with necessary diagram about Armstrong method for the generation of FM signal.	7
(b)	The maximum deviation allowed in an FM broadcast system is 75 KHZ. If the modulating signal is a single-tone sinusoid of 8 KHZ, determine the bandwidth of FM signal. What will be the bandwidth when modulating signal amplitude is doubled?	6
(c)	State Nyquist sampling Theorem.	3
4(a)	Explain the basic principle of Analog-to-Digital conversion.	7
(b)	How quantization error is introduced in PCM system? Explain.	5
(c)	Define information and entropy.	4
5(a)	Compare ASK, FSK and PSK.	6
(b)	What is multiplexing? Explain FDM in Telephony hierarchy.	7
(c)	Point out some special features of TDMA.	3

Contd. ...

6(a) Write short notes on any FOUR: 4×4=16

(i) Optical fiber communication system

(ii) PAM

(iii) Electrical noise and its types.

(iv) Types and properties of system

(v) Communication system in Nepal