22PHP314A

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

Branch – **PHYSICS**

MAJOR ELECTIVE COURSE – I: DIGITAL COMMUNICATIONS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 The AM signal has --------.
(i) unmodulated carrier (ii) LSB
(iii) USB (iv) all the above

2 The PLL device is
(i) Feedback system that compares output frequency and input frequency
(ii) Feedback system that compares output phase and input phase
(iii) Linear system that compares output resistance and input resistance
(iv) nonlinear system that compares output current and input current

3 Which is the most important sub system for recovering and reconstructing signals in a TDM system?
(i) envelope detector followed by a low pass filter
(ii) synchronization circuit for propert timing
(iii) band pass filter to segregate channels
(iv) coherent detector to ensurefrequency and phase correction

4 CDMA stands for
(i) Code division multiple access (ii) carrier division multiple access
(iii) Channel division multiple access (iv) Code digital multiple access

5 Ethernet frame consists of
(i) MAC address (ii) IP address
(iii) Default mask (iv) network address

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a. Define amplitude modulation. Write the expression for the peak amplitude of the AM wave.

OR

b. What is the difference between AM and DSBSC wave?

7 a. Describe frequency and phase modulation.

OR

b. Draw FM receiver block diagram.

8 a. Define ASK and PSK.

OR

b. What is high speed modem in digital communications?

9 a. Give a brief history of mobile telephone service.

OR

b. Explain frequency reuse factor.

10 a. Explain the term network protocols and understand its importance in data communication.

OR

b. List and describe the principles of ISDN.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a. Describe the DSBSC wave generation process using balanced modulator.

OR

b. Explain the operation of an ISB system with the necessary block diagram.

12 a. Describe the theory of amplitude modulation techniques.

OR

b. Explain the direct FM and PM modulators using varactor diode.

13 a. Describe the generation and demodulation of PSK.

OR

b. Describe the following (i) dual four level converter and (ii) TDM.

14 a. (i) Describe the concept of cell splitting. Why is it used?
(ii) Describe sectoring and state why it is used?

OR

b. Explain the second generation cellular telephone system.

15 a. Describe the following ATM network components: ATM endpoints, ATM switches, ATM transmission paths.

OR

b. Briefly describe the history of Ethernet.

Z-Z-Z

END