215006C

Tutorial 04

Multiple Choice Questions:

1. b. Digital-to-analog
2. A. amplitude
3. b. ASK
4. c. 500
5. d. 1200
6. c. 1900
7. c. 1000
8. d. 9000
9. c. 5
10. a. combinations of phase and amplitude
11. b. 8-PSK
12. b Changing the carier wave by the modulating signal
13. c. Can An infinite numbe of sine waves
14. d. Any of the above
15. b. Less than b
16. b. increases
17. b. increases
18. c. V.34
19. b. less than b
20. d. To reduce the error rate
21. a. FSK
22. a. Digital: analog
23. c. 56.6, 33.6
24. 15] b less than

Short Answer Exercises:

Baud rate ≠ bitrate / n

(1) a. Baud rate = 2000bps e. Baud rate = 2000 baud
b. Baud rate = 4000bps f. Baud rate = 2000 baud
c. Baud rate = 6000bps g. Baud rate = 1500 baud
d. Baud rate = 2000 baud h. Baud rate = 1500 baud.

(2) a.
b.
c.
d.

(3)

(1) baud rate = bitrate / n $n = \log_2 L$

(a) baud rate = 2000 / 1 = 2000bps n = 1

(b) baud rate = 4000 / 1 = 2000bps n = 1

(c) baud rate = bitrate / $\log_2(4)$

(d) baud rate = $\frac{6000}{\log_2 2}$ = 6000 / 1 = 6000bps

(d) baud rate = $\frac{6000}{\log_2 4}$ = 6000 / 2 = 3000 bps

(e) baud rate = $\frac{6000}{\log_2 8}$ = 6000 / 3 = 2000 bps

(f) baud rate = $\frac{4000}{\log_2(4)}$ = 4000 / 2 = 2000 bps

(g) baud rate = $\frac{6000}{\log_2 16}$ = 6000 / 4 = 1500bps

RATHNA

(5) baud rate = $\frac{36000}{\log_2(64)} = \frac{36000}{6} = 6000$ bps

(2) baud rate = bit rate / bit combination.

(a) baud rate = 2000/2 = 1000 bps
(b) baud rate = 6000/3 = 2000 bps
(c) baud rate = 6000/4 = 1500 bps
(d) baud rate = 6000/1 = 6000 bps

(3) bit rate = baud rate x $\log_2$(bit combination).

(a) bit rate = 1000 x $\log_2 2$ = 1000 bps
(b) bit rate = 1000 x $\log_2 8$ = 3000 bps
(c) bit rate = 1000 x $\log_2 16$ = 4000 bps

(4) 2 amplitude (4, 5) → ASK → 1 bit/baud

(5) 2 amplitude (6, 10.3, 12.00) → Ask → 1 bit/baud.

(6) 2 amplitude 4 and 2 phase (0, 180).
2 Ask → 1 bit/baud.

(7) 1 amplitude 4 and 2 phases (45, 135) →
2 psk → 1 bit/baud.

(8) 2 amplitude (4.5, 6.5) and phases (0, 180, 45, 215)
→ 8QAM → 3 bit/baud.

(9) I. bandwidth = (1+d) N baud
= (1+1) x 4000
= 8000 Hz

Date ____ / ____ / ____ Pg ____

II. fsh bandwidth = $f_1 - f_0 + N_{band}$
= 4000 + 4000
= 8000 Hz

III. bandwidth = bitrate / $\log_2$ (no of bits)
= 4000 / $\log_2(4)$
= 2000 Hz

IV. Bandwidth = $\frac{4000}{\log_2(16)} = \frac{4000}{4} = 1000$ Hz

(10) No, If is not a power of 2

(11) Number of points = 2^n where n is the number of bits represented by a point