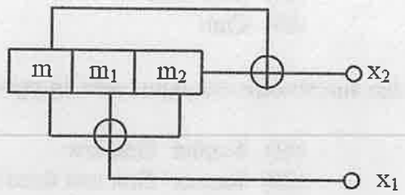
b. A convolution encoder is shown below. Draw the code Trellis and state encode diagram. 10 4 3 2



29. a.i. Describe LED transmitters. 5 2 4 1

ii. What is dispersion? Explain inter-modal dispersion. 5 2 4 1

(OR)

b.i. Differentiate Laser Diode from LED (light emitting diode) source in optical communication systems. 5 2 2 1

ii. Write short notes on single channel optical point-to-point communication systems. 5 2 5 1

30. a. Write short notes on satellites. Describe its significance and advantages. 10 2 6 1

(OR)

b. Write short notes on satellite system link models. 10 2 6 1

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Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2022
Sixth Semester

18CSE341T – COMMUNICATION SYSTEMS ENGINEERING
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

PART – A (25 × 1 = 25 Marks) Marks BL CO PO
Answer **ALL** Questions

1. UV radiation is used in 1 1 1 1
   (i) Industrial process
   (ii) Pharma industry
   (iii) Medical treatment and
   (iv) Radar imaging
   (A) (i) and (ii) (B) (iii) and (iv)
   (C) (i), (iii) and (iv) (D) (i), (ii), (iii) and (iv)

2. Odd one out 1 1 1 1
   (A) Telemetry (B) Satellite communication
   (C) Seismic processing (D) CDMA

3. Transducers converts physical characteristics to? 1 1 1 1
   (A) Electrical signals (B) Energy signals
   (C) Modulated signals (D) Power signals

4. Which waves travel at the same velocity as light waves in free space? 1 1 1 1
   (A) Optical signals (B) Radio waves
   (C) Stereo waves (D) UV rays

5. If an operating frequency range is 1240-1428 MHz, then bandwidth is? 1 2 2 2
   (A) 128 MHz (B) 428 MHz
   (C) 188 MHz (D) 240 MHz

6. Huffman coding is a 1 1 3 1
   (A) Fixed to variable length coding (B) Variable to fixed length coding
   (C) Fixed length coding (D) Variable length coding

7. Limpel-Ziv coding is widely used to 1 1 3 1
   (A) Compress the computer files (B) Un-compress the computer files
   (C) Shorten the computer files (D) Increase the computer files

8. When the base of logarithm is 2, then the unit of measure of information is 1 2 2 2
   (A) Bits (B) Bytes
   (C) Nats (D) Kilo bytes

9. Entropy is a measure of (A) Uncertainty of information (B) Energy (C) Power (D) Gain	1	1	1	1
10. Which particular loss is predominant in multi-mode fiber over single mode fiber? (A) Attenuation loss (B) Absorption loss (C) Modal dispersion loss (D) Radiation loss	1	2	5	2
11. Snell's law (A) $\text{Sin}\,\theta_1 / \sin\theta_2 = n_2 / n_1$ (B) $\text{Sin}\,\theta_2 / \sin\theta_1 = n_1 / n_2$ (C) $\text{Sin}\,\theta_1 \times \sin\theta_2 = n_2 / n_1$ (D) $\text{Sin}\,\theta_1 \times \sin\theta_2 = n_2 \times n_1$	1	2	5	2
12. Which fiber is preferred for high capacity short distance communication? (A) Single mode fiber (B) Multi-mode fiber (C) Plastic optical fiber (D) Single mode fiber and multi-mode fiber	1	2	5	1
13. In graded index fiber light rays propagate in the form of (A) Optical rays (B) Helical rays (C) Diagonal rays (D) Linear rays	1	2	5	1
14. In multi mode fiber, the difference between the refractive index of core and cladding is (A) Small (B) Large (C) Medium (D) Very large	1	1	5	1
15. A block code is _____ if any combination of two code words is also a code word. (A) Shifting code (B) Hamming code (C) Convolution code (D) Linear block code	1	1	3	1
16. The number of non-zero components of the code word is called (A) Hamming distance (B) Constraint length (C) Hamming weight (D) Code rate	1	1	3	1
17. Error detection capacity of LBC is (A) $d_{\min} \geq 2e_d + 1$ (B) $d_{\min} \geq e_d + 1$ (C) $d_{\min} \leq 2e_d + 1$ (D) $d_{\min} \leq e_d + 1$	1	3	4	2
18. Given $m(x) = x^3, g(x) = x + 1$, find the codeword (A) [1 1 1 1 1] (B) [1 0 1 0 1] (C) [0 0 0 0 0] (D) [1 1 0 0 0]	1	3	3	2
19. (i) convolution codes depends on the preceding block of message bits (ii) convolution codes does not depend on the preceeding block of message bit (A) Statement (i) is false (B) Statement (ii) is true (C) Statement (i) is true (D) Statement (i) and (ii) is false	1	3	4	2

20. The received code contains an error if the syndrome vector is (A) Zero (B) Non-zero (C) Infinity (D) One	1	1	4	1
21. A line joining the planet and the sun sweeps out equal area in equal interval of time. This is called (A) Kepler' second law (B) Kepler' first law (C) Kepler' third law (D) Kepler' first and third law	1	1	6	1
22. INSAT-2E was launched from (A) India (B) French Guiana (C) Peru (D) Mayotte	1	1	6	1
23. Frequencies in UHF range propagate by means of (A) Ground waves (B) Sky waves (C) Space waves (D) Surface waves	1	1	6	1
24. The speed of rotation of orbits is _____ for circular orbits. (A) Zero (B) Constant (C) One (D) ∞	1	1	6	1
25. In case of satellite communication (A) Uplink freq > Downlink freq (B) Downlink freq > Uplink freq (C) Downlink freq = Uplink freq (D) Downlink freq $\geq$ Uplink freq	1	2	6	2

PART – B (5 × 10 = 50 Marks)

	Marks	BL	CO	PO

Answer **ALL** Questions

26. a.i. List down few simplex and duplex communication applications.	5	2	1	1
ii. Write a note on significance of human communications.	5	2	1	1
(OR)				
b.i. Write short notes on analog and digital signals.	5	2	1	1
ii. Write a note on Bandwidth.	5	2	1	1
27. a. Design a Huffman code for the source probabilities given $P = \left\{\frac{1}{2}, \frac{1}{8}, \frac{1}{16}, \frac{1}{16}, \frac{1}{4}\right\}$.	10	4	3	2
(OR)				
b.i. Explain the joint and conditional entropy.	5	2	2	2
ii. Explain the step-by-step procedure of Limpel-Ziv coding.	5	2	3	1
28. a. Five-bit data 01101 is given. Represent given data in Hamming code. If received hamming code is 1110101 with even parity, then detect and correct error.	10	4	3	2
(OR)				