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Reg.No : .....

Name : .....

**MAHATMA GANDHI UNIVERSITY, KOTTAYAM**  
**MGU-UGP (HONOURS) REGULAR EXAMINATION MARCH 2025**  
**SECOND SEMESTER**  
**Discipline Specific Core Course (DSC) - MG2DSCECT101 - DATA**  
**COMMUNICATION**  
(2024 ADMISSION ONWARDS)

**Duration: 1.5 Hours**

**Maximum Marks: 50**

*Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I)*  
*and Appreciation(Ap)*

Students should attempt at least one question from each course outcome to enhance their overall  
outcome attainability.

**Part A**

Multiple Choice Questions

Answer all questions

Each question carries 1 marks

1. Define the formula for Shannon's capacity? [K] / [CO1]
  - a). Capacity =  $2 \times \text{bandwidth} \times \log_2(L)$
  - b). Capacity =  $\text{bandwidth} \times \log_2(1 + \text{SNR})$
  - c). Capacity =  $\text{bandwidth} / (1 + \text{SNR})$
  - d). Capacity =  $\text{bandwidth} \times L^2$
  
2. What happens to the wavelength of sound waves as the frequency increases? [U] / [CO1]
  - a). Wavelength increases
  - b). Wavelength decreases
  - c). Wavelength remains the same
  - d). Wavelength becomes zero
  
3. In which type of data flow does data travel in only one direction? [U] / [CO1]
  - a). Simplex
  - b). Half-Duplex
  - c). Full-Duplex
  - d). None of the above

4. Recall that the Parabolic dish antennas are widely used in terrestrial microwave communication due to their ability to: [U] / [CO2]
- a). Minimize attenuation
  - b). Transmit signals in all directions
  - c). Focus signals into narrow beams
  - d). Reduce power consumption
5. Identify the correct feature is commonly found in BNC Connectors [U] / [CO2]
- a). Screw-on locking mechanism
  - b). Push-Pull locking mechanism
  - c). Bayonet locking mechanism
  - d). All of the above
6. The constellation diagram in QAM is used for to represent [K] / [CO3]
- a). the amplitude
  - b). both amplitude and phase
  - c). frequency
  - d). phase
7. Provide an example of synchronous transmission from the options given. [U] / [CO3]
- a). USB (Universal Serial Bus)
  - b). Email communication
  - c). RS-232 serial communication
  - d). Morse code transmission
8. Select the correct feature of serial communication: [U] / [CO3]
- a). Data is transmitted in parallel over multiple lines
  - b). Data is transmitted bit by bit using one communication line
  - c). Data transmission is limited to short distances only
  - d). It uses a clock signal to synchronize data transmission
9. The technique that expands the bandwidth of a signal by replacing each data bit with n bits using a spreading code. [U] / [CO3]
- a). DSSS
  - b). FHSS
  - c). FDM
  - d). WDM
10. The relationship between bit rate and baud rate is [U] / [CO3]
- a). Bit rate is always equal to baud rate
  - b). Bit rate is always less than baud rate

- c). Baud rate represents the number of signal units per second, while bit rate represents the number of bits per second
- d). Bit rate and baud rate are unrelated

[1x10 = 10]

### Part B

Short Answer Questions

Answer any 4 questions

Each question carries 5 marks

- 11. Describe the relationship between bitrate and bandwidth in a communication system. [U] / [CO1]
- 12. Explain the different types of data representation in communication systems with examples. [U] / [CO1]
- 13. How to reduce the signal loss in coaxial cable? [U] / [CO2]
- 14. Describe the working of Adaptive Delta Modulation (ADM). How does it differ from standard Delta Modulation (DM)? [U] / [CO3]
- 15. Explain the need for Analog to Digital Conversion in communication systems. [U] / [CO3]
- 16. Explain the concept of multiplexing and its types. [U] / [CO3]

[5x4 = 20]

### Part C

Essay Questions

Answer any 2 questions

Each question carries 10 marks

- 17. Discuss the primary types of transmission impairments in communication system and explain their causes, effects on signal integrity, and common mitigation techniques. [U] / [CO1]
- 18. Describe the construction of a twisted pair cable, including the purpose of twisted the wires and the different types of shielding (UTP and STP) [U] / [CO2]
- 19. Discuss the advantage, disadvantage and applications of ASK and FSK. [U] / [CO3]

[10x2 = 20]