Ministry of Higher Education

Al-Maarif University College

Computer Engineering Techniques Department

**Final Exam 2021-2022**

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| Subject:  | **Digital communication**  | Time: **3 hours** |
| Branch:  |  | Level: Third |

**Note: Attempt Five Questions Only:**

**Q1\ Draw a block diagram of a digital communication system, obtain mean function of each element.**

**Q2\ Find the correct choice:**

 **1-the communications medium causes the signal to be**

1. **Amplified.**
2. **Attenuated.**
3. **Modulated.**
4. **Interfered with.**

 **2-the process of transmitting two or more information signals simultaneously over the same channel is called**

1. **Multiplexing**
2. **Telemetry**
3. **Detection**
4. **Modulation**

  **3-two key barriers to human communication are**

1. **Distance.**
2. **Cost.**
3. **Ignorance.**
4. **Language.**

 **4-which of the following is not a major communications medium?**

1. **Free space.**
2. **Water.**
3. **Wires.**
4. **Fiber-optic cable.**

 **Q3\ Explain in brief a Delta Modulation.**

 **Q4\ What is difference between Pulse-code modulation and analog pulse modulation techniques.**

**Q5\ For a pulse-amplitude Modulation (PAM) transmission of voice signal having maximum frequency equal to fm=3KHz, calculate the transmission bandwidth. It is given that the sampling frequency fs=8KHz and the pulse duration Ꞇ=0.1 Ts.**

**Q6\The information in an analog signal voltage is to be transmitted a bandwidth of 200Hz and an amplitude range of -5 to +5 volts.**

1. **Find the minimum sampling rate required.**
2. **Find number of bits in each PCM word.**
3. **Find minimum bit rate required in the PCM signal.**
4. **Find the minimum absolute channel bandwidth required for the transmission of the PCM signal.**