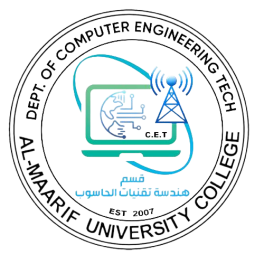
الوصف: A picture containing text, watch

Description automatically generatedMinistry of Higher Education

Al-Maarif University College

Computer Engineering Techniques Department

**Final Exam 2021-2022**

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

**Note: Attempt Five Questions Only:**

**Q1\ Compare between analog and digital modulation.**

**Q2\ Make a list of signal’s types , Explain in brief one type only.**

**Q3\ Find the correct choice:**

**1-The function of the input transducer in a communication system is:**

1. **To transmit the message signal**
2. **To modulate the message signal.**
3. **To convert message sound signal into electrical signal.**
4. **None of the above.**

**2-Communication is the process of**

1. **Keeping in touch.**
2. **Broadcasting.**
3. **Exchanging information.**
4. **Entertainment by electronics.**

**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.**

**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.**