| Name:<br>Enrolment No: | UPES |
|---|---|

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**
**End Semester Examination, May 2021**

**Course: Wired and Wireless Sensor Network** — **Semester: VIII**
**Program: B. Tech ECE** — **Time 03 hrs.**
**Course Code: ECEG4020** — **Max. Marks: 100**

**Instructions:**

**1. Kindly take the examination from Laptop + Mobile or Mobile only with recommended OS & Browser (mentioned in Exam manual)**
**2. Section A - Kindly type the answers in test box.**
**3. Section B & Section C - Scan and Upload question type.**
**4. Use Plain paper (A4 sheet) & Black Gel Pen**
**5. Kindly note that to avoid connectivity glitches while uploading your answer sheet, please try to finish earlier than the end time to ensure uploading. To Scan and Upload answers please make sure that when picture is being taken:**

- **ensure that shadows do not fall on the paper**
- **ensure that the camera is held stably above the answer sheet in parallel to it**
- **ensure the frame of the picture includes the answer sheet and no surroundings**
- **ensure sufficient lighting in the room**
- **If your answer is more than 1 page for particular question, please scan all the pages of answer and then press the upload button**
- **Same questions should be opened on laptop for which you are uploading scanned answer sheet from mobile**

**Example: If you are scanning answer sheet for Que No. 1 from Mobile, then Que No. 1 should be visible on your laptop screen.**

| **SECTION A** | | | |
|---|---|---|---|
| **S.No.** | **Answer All the questions** | **Marks** | **CO** |
| 1 | Describe the five categories of network components in one-line definition. What are two functions of intermediary devices on a network? | **5** | **CO2** |
| 2 | Highlighting the type of content to be stored in each memory, explain the use of SRAM, SD Card, SPI Flash and EEPROM in Microcontrollers? | **5** | **CO2** |
| 3 | What are the advantages and disadvantages of centralized topology in WSN? | **5** | **CO3** |
| 4 | Briefly explain ARP, RARP, ICMP and IGMP protocols. | **5** | **CO1** |
| 5 | With examples, differentiate between guided and unguided transmission mediums. | **5** | **CO4** |
| 6 | Elucidate the major differences between MANETs and WSN. | **5** | **CO2** |
| **SECTION B** | | | |
| **S.No** | **Answer all the questions** | **Marks** | **CO** |

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|---|---|---|---|
| 7 | With respect to addressing used in internet (TCP/IP protocol), explain physical address, logical address, port address and specific address. Give examples. | **10** | **CO1** |
| 8 | Define components of a typical sensing node of a WSN with its block diagram. | **10** | **CO3** |
| 9 | Compare the following microcontrollers on the basis of Bus Width, CPU Architecture, Memory, Power Consumption and Cost:<br>a. 8051;<br>b. PIC;<br>c. AVR;<br>d. ARM. | **10** | **CO3** |
| 10 | Identify the technical issues and challenges in designing a WSN for the Patient Monitoring System of a Hospital for about 100 patients under critical observations. | **10** | **CO4** |
| 11 | What are the advantages and disadvantages of fully connected peer-to-peer and multi-hop peer-to-peer network? | **10** | **CO2** |
| **SECTION-C** | | | |
| **S.No** | **Answer all the questions** | **Marks** | **CO** |
| 12 | **(A)** Design a WSN (block diagram) that can be used in Building Automation (Smart Buildings)?<br>**(B)** Design a WSN (block diagram) that can be used to detect forest fire in summer.<br><br>Analyze the key features and specifications of both the designs, including possible wireless standards and network topologies. | **20** | **CO3** |