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| **Name:**<br>**Enrolment No:** | |

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**
**Supplementary Semester Examination, May 2022**

**Course: Embedded System** **Semester: IV**
**Program: B.Tech Mechatronics Engg.** **Time: 03 hrs.**
**Course Code: ECEG-2003** **Max. Marks: 100**

**Instructions:**

**SECTION A**
**(5Qx4M=20Marks)**

| S. No. | *Attempt all the questions* | **Marks** | **CO** |
|---|---|---|---|
| 1 | Write down the differences between OS and RTOS. | **4** | **CO5** |
| Q 2 | Draw pin diagram of 8051 microcontroller | **4** | **CO1** |
| Q 3 | Discuss about task and task states in Real time operating systems with diagram. | **4** | **CO4** |
| Q 4 | Write down a program for LED blinking for 8051 microcontroller using embedded C/ Assembly language. | **4** | **CO2** |
| Q 5 | A 5-bit DAC has a current output. For a digital input of 101000, an output current of 10mA is produced. What will $I_{OUT}$ be for a digital input of 11101? | **4** | **CO3** |

**SECTION B**
**(4Qx10M= 40 Marks)**

| | *Attempt all the questions* | | **CO** |
|---|---|---|---|
| Q 6 | Assume the following values for the ADC clock frequency = 2 MHz; VT = 0.1 mV; DAC has F.S. output = 10.23 V and a 10-bit input. Determine the following values.<br>a. The digital equivalent obtained for VA = 3 V.<br>b. The conversion time.<br>c. The resolution of this converter | **10** | **CO4** |
| Q 7 | Detail the different addressing modes of 8085 microprocessor with examples. | **10** | **CO1** |
| Q 8 | Define the term Encoding and flow control. Also, briefly explain the objective of control hierarchy and the steps involved in hierarchy. | **10** | **CO4** |
| Q 9 | Explain Serial Vs Parallel Communication strategies with example. | **10** | **CO5** |

| SECTION-C<br>(2Qx20M=40 Marks) | | | |
|---|---|---|---|
| | *Attempt any two of the followings* | | **CO** |
| Q 10 | (a) Draw and explain the architecture of 8051 microcontroller.<br>(b) Draw and explain working of R/2R Ladder DAC. Also, write down the various DAC Specifications. | **10+10** | **CO4** |
| Q 11 | (a) Explain the Real time operating system. Also. Elaborate the various scheduling algorithm used in RTOS.<br>(b) Write the assembly language program for sort array in ascending order in microprocessor. | **10+10** | **CO5** |
| Q 12 | (a) Briefly explain the term embedded system and classification of embedded system with example.<br>(b) What is the purpose and use of flag registers in 8085 processor and 8051 controllers? Explain with an example | **10+10** | **CO3** |