

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec 2019

Programme Name: B. Tech- CSE (Mobile Computing + ECRA+OGI+ IoTSC)

Semester : V

Course Name : Microprocessor & Embedded Systems

Time : 03 hrs

Course Code : CSEG 3006

Max. Marks : 100

Nos. of page(s) : 02

Instructions: Assume any data in programming, if required

SECTION-A (4 x 5 = 20 Marks)

| S. No. | Attempt <i>all</i> the questions | Marks | CO |
|--------|---|-------|-----|
| Q.1 | Compare the microprocessor and microcontroller-based systems with example. | 5 | CO1 |
| Q.2 | What are the different states of the task? Draw the state transition diagram of task. | 5 | CO4 |
| Q.3 | Interface the 8051 microcontrollers with 7 segment display device and write the assembly/embedded 'C' code to display the numbers 0 to 9. | 5 | CO3 |
| Q.4 | What is the difference between soft and hard real time systems? | 5 | CO4 |

SECTION-B (4 x 10 = 40 Marks)

| S. No. | Attempt <i>all</i> the questions | Marks | CO |
|--------|---|-------|-----|
| Q.5 | (a) In 8085 processor, write an assembly language program to arrange ten 8-bit numbers in ascending order. The number are stored in memory starting from 4000 H. OR (b) Explain the working of successive approximation ADC and interface it with microprocessor /microcontroller. | 10 | CO2 |
| Q.6 | Explain the functions of following hardware pins of 8085 processor i) HOLD, HLDA ii) ALE iii) TRAP iv) SOD,SID v) Ready | 10 | CO1 |
| Q.7 | Draw the timing instruction INR M and explain the function of each machine cycle. | 10 | CO2 |
| Q.8 | Construct the memory map (address table) to interface 16 kB of RAM and 16tenkB of ROM using 8kB of RAM and 8kB of ROM respectively for 8085 processor. Draw the decoder and complete memory system | 10 | CO4 |

SECTION-C (2 x 20 = 40 Marks)

Attempt any *two* of the followings

| | | | |
|------|--|----------|-----|
| Q.9 | (a) Draw the block diagram, of 8051 microcontroller with RAM memory structure and complete description with SFR and bit addressable RAM. (b) Draw and explain the block diagram (decoder circuit) explain the generation of control signals. Also write its corresponding truth table | 10 10 | CO3 |
| Q.10 | Water level indicator is used in tanks to indicate the level of liquids and alert us when the tank is full. So, by the circuit we can monitor the various levels of the tank and can avoid spillage of water. We can configure our supplies according to the various levels of tank as shown in figure below. Such module or circuit can be installed in big buildings where manual monitor of tanks is difficult and its indicator can be placed at some centralized place. | 20 | CO4 |

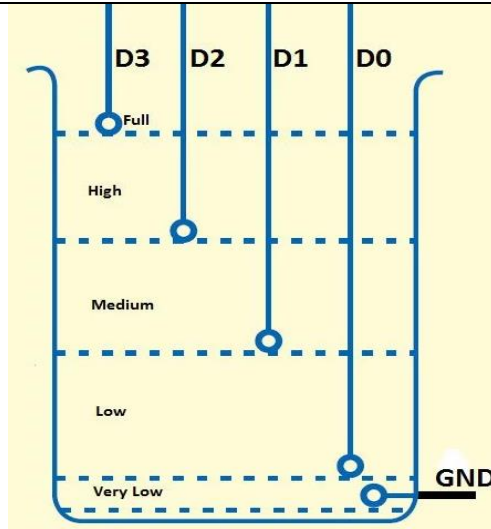


Fig.1 Water controller

Interface the LCD to 8051 microcontroller and write assembly language or embedded 'C' program to display the conditions of tank on LCD using 8051 microcontroller on LCD display for the conditions listed below in options (a), (b), (c), (d) and (e). It is optional to use the interface of 8255 PPI with 8051 microcontroller.

- (a) FULL
- (b) HIGH
- (c) MEDIUM
- (d) LOW
- (e) VERY LOW

Q.11

Detail the scheduling associated with the real time operation listed in fig.2. What type of problems can be associated with the execution of the scheduled task. Also suggest the solution and description of scheduling method.

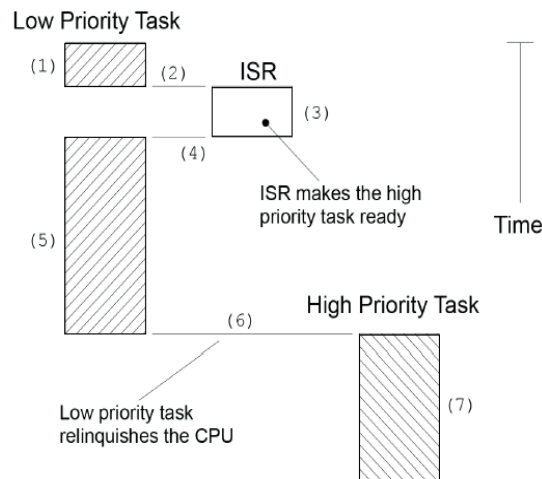


Fig.2

(b) Give the details and examples of different types of semaphore applicable for RTS.

10

CO5

10