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## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program: B.Tech (EE)

Subject (Course): Advanced Microprocessor & Embedded System

Course Code : ELEG365

No. of page/s: 02

Semester – VI

Max. Marks : 100

Duration : 3 Hrs

### SECTION A

**Note: All questions are compulsory & carry equal marks. (5x4=20)**

- Q1. Explain protected modes operation in 80386 including memory segmentation CO4
- Q2. Draw and discuss the format for following register for 8051-
- (i) Program status word
  - (ii) Timer control register CO4
- Q3. Draw and discuss the timing diagram read cycle for max mode in 8086. CO2
- Q4. Discuss the pin description and Architecture of 8253 CO3

### SECTION B

**Note: All questions are compulsory & carry equal marks. (10x4=40)**

- Q5. Discuss the pin description of 8259. Draw the architecture and discuss the signals. Also discuss the operating modes. CO3
- Q6. Write a program to display 0-9 on seven segment with 8051. CO4
- Q7. Write a program with 8086 to make a LED on, if fire occurs. CO2
- Q8. Discuss the pin description of 8255 and draw and discuss the architecture and modes of the same. CO3

## SECTION C

**Note: All questions carry equal marks. Q9 has internal choice and Q10 is compulsory**

**(20x2=40)**

Q9. (i) Design a line follower robot with one free wheel, two DC motors and two IR sensors with 8086.

(ii) Write the Program for the robot designed in Q9(i) with 8086 CO1

Or

Design a LED light string with eight LEDs to glow with 8086 in following patterns, with the help of block diagram, CWR and interfacing IC with port A as input port and port B as output port-

(i) When even LEDs are 'ON' make odd LEDs 'OFF' vice versa

(ii) LEDs glow one after another with some defined time delay

(iii) When a switch is 'ON' then make all LEDs 'ON' and when switch is 'OFF' make them 'OFF' CO1

Q10. (i) Design a traffic light signal with four directions- north, south, east, west with three LEDs each side- Red, Yellow, Green. Make the traffic of north-south 'RUN' while east -west is 'STOP' and vice versa. Provide a delay of count of 'FF' after each indicator.

(ii) Write Program for the system in Q10(i) with 8051 CO4

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### SECTION A

**Note: All questions are compulsory & carry equal marks. (5x4=20)**

- Q1.** Discuss Instruction with an example : PUSH, POP CO2
- Q2.** Draw and discuss the format for following register for 8051-
- (i) Serial ports control register
  - (ii) Timer mode control register CO4
- Q3.** Draw and discuss the timing diagram read cycle for min mode in 8086. CO2
- Q4.** Discuss the pin description, modes and Architecture of 8251. CO3

### SECTION B

**Note: All questions are compulsory & carry equal marks. (10x4=40)**

- Q5.** Discuss the pin description of 8253. Draw the architecture and discuss the signals. Also discuss the operating modes. CO3
- Q6.** Write a program to display 0-9 on seven segment with 8051. CO4
- Q7.** Write a program to make a LED on, if temperature of furnace exceeds from 55°C with 8086

CO2

**Q8.** Discuss the pin description of 8255 and draw and discuss the architecture and modes of the same. CO3

### SECTION C

**Note: All questions carry equal marks. Q10 has internal choice and Q9 is compulsory  
(20x2=40)**

**Q9.** (i) Design a traffic light signal with four directions- north, south, east, west with three LEDs each side- Red, Yellow, Green. Make the traffic of north-south 'RUN' while east –west is 'STOP' and vice versa. Provide a delay of count of 'FF' after each indicator.

(ii) Write Program for the system in Q9 (i) with 8051 CO4

**Q.10** (i) Design a smart agriculture system where DC motor will be 'ON' if the soil moisture goes down to a threshold value. Discuss the interfacing and CWR with details.

(ii) Write the Program for the system designed in Q10 (i) with 8086. CO1

Or

Design Diwali light string for sixteen LEDs with 8086, interfacing IC and CWR for the following patterns-

- (i) Make first eight LEDs 'ON' and next eight LEDs 'OFF' and vice versa with some defined time delay.
- (ii) Make alternate LEDs 'ON' and 'OFF'
- (iii) Make all LEDs 'ON' and 'OFF' alternatively