KUMARAGURU college of technology
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Register Number:……

M.E. DEGREE EXAMINATIONS: DEC 2022

(Regulation 2018)

First Semester

EMEDDED SYSTEMS TECHNOLOGIES

P18EST1004: Micro Controller Based System Design

COURSE OUTCOMES

CO1: Describe the architecture , instruction sets and peripherals of the 8051 microcontroller

CO2: Write programs for 8051 microcontroller to interfacing the peripheral devices

CO3: Describe the architecture , instruction sets and peripherals of the PIC microcontroller

CO4: Write programs for PIC microcontroller to interfacing the peripheral devices

CO5: Distinguish and summarize the various components in system design using microcontroller

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. External access is used to permit _____ CO1 [K_1]

   a) peripherals b) Power supply

   c) ALE d) Memory Interfacing

2. Timer 0 is a _____ bit register CO1 [K1]

   a) 32 b) 8

   c) 16 d) 10

3. What is the execution speed of instructions in PIC especially while operating at the maximum value of clock rate? CO2 [K2]

   a) 0.1 µs b) 0.2 µs

   c) 0.4 µs d) 0.8 µs

4. Matching type item with multiple choice code CO2 [K3]

List I	List II
A. Port E	i. - bit port that can be used as both input and output port.
B. Port B	ii. 8-bit and the input of output operation is decided by the status of the TRISC register.

C. Port C	iii. 8-bit port acts as a slave port for connection to the microprocessor BUS.
D. Port D	iv. 3-bit port which serves the additional function of the control signals to the analog to digital converter.

a) a) A-iv, B-i, C-ii, D-iii
b) a) A-iv, B-iii, C-ii, D-i
c) a) A-iii, B-ii, C-i, D-iv
d) a) A-i, B-ii, C-iii, D-iv

5. What is the standard form of UART? CO3 [K1]

a) Universal Asynchronous Synchronous Receiver Transmitter
b) Universal Synchronous Receiver Transmitter
c) Universal Asynchronous Receiver Transmitter
d) Universal Synchronous Asynchronous Receiver Transmitter

6. Which mode allows to deliver the contents of 16-bit timer into a SFR on the basis of rising/falling edge detection? CO3 [K_2]

a) Capture Mode
b) Compare Mode
c) PWM Mode
d) MSSP Mode

7. Assertion (A): PIC microcontrollers are meant to enable simple programming and interfacing in embedded system design. CO4 [K_2]

Reason (R): The PIC microcontroller programming is performed through 'MP-Lab' software.

a) A is correct but R is not correct
b) Both A and R are correct and R is the correct explanation of A
c) A is not correct but R is correct
d) Both A and R are correct and R is not the correct explanation of A

8. When can LCD display the text form of data? CO4 [K_2]

a) only when RS line is high
b) only when RW line is high
c) only when RS line is low
d) only when RW line is low

9. Which among the below specified major functionalities is/are associated with the programmable timers of PIC? CO5 [K_2]

A. Excogitation of Inputs

B. Handling of Outputs

C. Interpretation of internal timing for program execution

D. Provision of OTP for large and small production runs

a) Only C
b) C & D
c) A ,B & D
d) A, B & C

10. Which channel would be selected if the values of channel bits CHS0 & CHS1 are '1' & '0' respectively in ADC Status Register? CO5 [K_1]

a) AIN0 b) AIN1

c) AIN2 d) AIN3

PART B (10 x 2 = 20 Marks)

11. List the features of 8051 microcontroller. CO1 [K_2]
12. What is PSW in 8051 microcontroller? CO1 [K_1]
13. Define WREG register in PIC 18. CO2 [K_1]
14. Give the role of watch dog timer in PIC micro controller CO2 [K_L]
15. Draw the block diagram for interfacing a sensor with PIC. CO3 [K_1]
16. List the three data transfer speed levels in I2C. CO3 [K_2]
17. State the need for gate signals in converters CO4 [K_2]
18. Define the term glitch in ADC CO4 [K_1]
19. What is stand alone data acquisition system? CO5 [K_1]
20. List the applications of PIC microcontroller. CO5 [K_2]

PART C (6 x 5 = 30 Marks)

21. Write a program to add two 8 – bit numbers using 8051. CO1 [K_3]

22. Explain the different addressing modes of PIC micro controller in brief. CO2 [K_2]

23. Discuss in detail about I^2C bus and serial EEPROM. CO3 [K_2]

24. Explain briefly about Keyboard interfacing with PIC microcontroller. CO4 [K_3]

25. Describe the architecture of PIC microcontroller with neat sketch. CO5 [K_2]

26. Explain the block diagram approach of ticket vending machine using PIC microcontroller. CO5 [K_3]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27.	With neat internal block schematic, explain the architecture of 8051.	CO1	[K_2]
28.	Discuss in detail about the function of various port pin of PIC micro controller	CO2	[K_2]
29.	Describe about PIC interfacing with peripherals that includes sensors, ADC, DAC and keyboard with neat sketches.	CO3	[K_3]
30.	Explain briefly about LCD interfacing with PIC microcontroller with neat diagram.	CO4	[K_3]
31.	Explain about the measurement of power frequency using PIC Microcontroller	CO5	[K_2]

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