Register Number:……..

KUMARAGURU college of technology
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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2015)

Fourth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U15ECT402**:** Microprocessors and Microcontrollers

COURSE OUTCOMES

CO1: Illustrate the architecture of 8086 microprocessor and minimum /maximum modes of operation (K2).
CO2: Develop 8086 assembly language programs for given applications (K3).
CO3: Explain the architecture of 8051 microcontroller (K2).
CO4: Develop applications using 8051 microcontroller and peripherals (K3).
CO5: Describe the architecture and peripherals of MSP430 microcontroller (K2).
CO6: Employ MSP430 assembly language programming for various applications (K3).

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching type item with multiple choice code CO1 [K_2]

List I	List II
A. DB	i. used to direct the assembler to reserve only 10-bytes
B. DT	ii. used to direct the assembler to reserve only 4 words
C. DW	iii. used to direct the assembler to reserve byte or bytes
D. DQ	iv. used to direct the assembler to reserve words

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

2. The 8086 fetches instruction one after another from _____ of memory CO2 [K_2]

a) code segment b) IP
c) ES d) SS

3. The timer sequence in 8051 is: CO3 [K_2]

   1. Set the appropriate control bits and turn on Timer
   2. If required enable timer interrupt and global interrupts
   3. Select the desired clock and operating mode
   4. Write the starting value for count up sequence into the associated count registers

   a) 2-3-4-1 b) 1-3-2-4

   c) 3-4-2-1 d) 4-1-3-2

4. How many bytes of bit addressable memory are present in 8051 based microcontrollers? CO3 [K_3]

   a) 8 bytes b) 16 bytes

   c) 32 bytes d) 128 bytes

5. Assertion (A): Internal Polling sequence determines the interrupt request to be serviced. CO4 [K_3]

   Reason (R): Two or more interrupts of same priority occur at same time.

   a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A

   c) A is true but R is false d) A is false but R is true

6. When the micro controller executes some arithmetic operations, then the flag bits of which register are affected? CO4 [K_2]

   a) PSW b) DPTR

   c) SP d) PC

7. The clock module in MSP430 provides three outputs: CO5 [K_2]

   1) Master clock, MCLK
   2) Sub-system master clock, SMCLK
   3) Auxiliary clock, ACLK
   4) Peripheral clock, PCLK

   a) 1,3,4 b) 1,2,4

   c) 1,2,3 d) 2,3,4

8. The ALU in the MSP430 handles CO5 [K_2]

   a) Add, Sub, Mult & Div operations b) Add, Sub, Comp & logical operations

   c) Add, Sub, Comp, Mult & logical operations d) Add, Sub, Mult & logical operations

9. Assertion (A): The negative flag N is made equal to the MSB of the result, which indicates a Negative number if the values are signed. CO6 [K_2]

Reason (R): The C, Z, N, and V bits are not affected by many of the operations performed by the ALU

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

10. The MSP430 has _____ active mode of operation. CO6 [K_2]

a) One
b) Five
c) Four
d) Seven

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. What are the assembler directives there in 8086? CO1 [K_2]
12. How would you classify various string instructions available in 8086? CO2 [K_2]
13. List the counters available in 8051. CO3 [K_2]
14. What is the difference between microprocessor & micro controller? CO3 [K_3]
15. Differentiate between polling and interrupt. CO3 [K_3]
16. What happens in power down mode of microcontroller? CO4 [K_3]
17. Write about Status Register (SR) register of MSP430 microcontroller with an example. CO5 [K_3]
18. What is the purpose of EEM (Embedded Emulation Module) in MSP430 microcontroller? CO5 [K_2]
19. Mention various timers present in MSP430 microcontroller. CO6 [K_2]
20. What are the factors that affect the accuracy of the ADC? CO6 [K_2]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. (i) How would you show your understanding of internal hardware Architecture of 8086 microprocessor with neat diagram? (10) CO1 [K_2]

(ii) What is Minimum mode and maximum mode of operation in 8086? (4)

22. (i) Explain the addressing modes of 8086 with example. (10) CO2 [K_3]

(ii) What is Multi programming? (4)

23.	Describe the memory organization in 8051 microcontroller.		CO3	[K_2]
24.	Explain the concept of the on chip data memory and register bank in 8051.		CO3	[K_2]
25.	Explain with diagram to interface a stepper motor with 8051Microcontroller. Also write an 8051 ALP to run the stepper motor in both forward and reverse direction with delay.		CO4	[K_4]
26.	(i) Explain in detail about the register sets of MSP430 microcontroller. (ii) Explain the MSP430 microcontroller addressing modes.	(7) (7)	CO5	[K_2]
27.	(i) Elaborate the operations of Real time clock of MSP430. (ii) Explain the operation of Comparator in MSP430.	(7) (7)	CO6	[K_2]

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