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Question Paper Code: 55B01

B.E./B.Tech. DEGREE EXAMINATION, NOV 2019

Fifth Semester

Biomedical Engineering

15UBM501 -MICROPROCESSOR AND MICROCONTROLLER

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The processor status word of 8085 microprocessor has five flags namely: CO1- R
(a) S, Z, AC, P, CY (b) S, OV, AC, P, CY
(c) S, Z, OV, P, CY (d) S, Z, AC, P, OV
2. In 8085 microprocessor, the RST6 instruction transfer programme execution to CO1- R
following location
(a) 0030H (b) 0024H (c) 0048H (d) 0060H
3. The program counter in a 8085 micro-processor is a 16-bit register, because CO2-U
(a) It counts 16-bits at a time (b) It has to fetch two 8-bit data at a time
(c) There are 16 address lines (d) It facilitates the user storing 16-bit data temporarily
4. A good assembly language programmer should use general purpose registers CO2- U
rather than memory in maximum possible ways for data processing. This is
because:
(a) Data processing with registers is easier than with memory
(b) Data processing with memory requires more instructions in the program than that with
registers
(c) Of limited set of instructions for data processing with memory
(d) Data processing with registers takes fewer cycles than that with memory

5. When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected? CO3- U
 (a) PSW (b) SP (c) DPTR (d) PC
6. How many bytes of bit addressable memory are present in 8051 based microcontrollers? CO3- U
 (a) 8 bytes (b) 32 bytes (c) 16 bytes (d) 128 bytes
7. _____ usually store the output generated by ALU in several arithmetic and logical operations. CO4- R
 (a) Accumulator (b) Special Function Register (c) Timer Register (d) Stack Pointer
8. Identify the condition approves to prefer the EPROM/ROM versions for mass production in order to prevent the external memory connections. CO4- U
 (a) size of code < size of on-chip program memory
 (b) size of code > size of on-chip program memory
 (c) size of code = size of on-chip program memory
 (d) size of code \geq size of on-chip program memory
9. _____ is the execution speed of instructions in PIC especially while operating at the maximum value of clock rate. CO5- R
 (a) 0.1 μ s (b) 0.2 μ s (c) 0.4 μ s (d) 0.8 μ s
10. _____ Instruction is applicable to set any bit while performing bitwise operation settings. CO5- R
 (a) bcf (b) bsf (c) cbf (d) both a & b

PART – B (5 x 2= 10 Marks)

11. Calculate the execution time of an instruction MVI A,82H in 8085 runs at 2 MHz. CO1- App
12. Develop an assembly level program in 8085 to check whether the content of accumulator is even or odd. CO2- U
13. Indicate the addressing modes of 8051 microcontroller. CO3- U
14. How does 8051 differentiate between the external and internal program memory? CO4- Ana
15. Differentiate ARM processor and PIC microcontroller. CO5- U

PART – C (5 x 16= 80Marks)

16. (a) (i) Explain the hardware architecture of 8085 microprocessor with a neat block diagram. CO1- U (10)
- (ii) Draw and explain the timing diagram for MVI A, 32H. CO1- U (6)
- Or
- (b) (i) Illustrate the architecture of 8086 microprocessor. CO1- U (10)
- (ii) Two machine codes 3EH and 32H are stored in memory locations 2000H and 2001H respectively. The first machine code 3EH represents the opcode to load a data byte in the accumulator and the second code 32H represents the data byte to be loaded in the accumulator. Illustrate and explain the bus timings of 8085 as these machine codes are executed. CO1- U (6)
17. (a) (i) Explain the operations carried out when 8085 executes the instruction, CO2- U (10)
1. MOV A, M
 2. XCHG
 3. DAD B
 4. DAA
- (ii) Compare the similarities and differences of CALL and RET instructions with PUSH and POP instructions. CO2- U (6)
- Or
- (b) (i) Evaluate the contents of registers A, B, C and D and the flag status ie (S,Z and CY) as the following instructions are executed. CO2- U (8)
- MVI A,00H
MVI B, F8H
MOV C,A
MOV D,B
HLT
- (ii) Explain the following instructions LXI, CMC, RLC, RAL. CO2- U (8)

18. (a) (i) Illustrate the architecture of 8051 microcontroller. CO3- U (10)
(ii) Describe in detail about the special function registers in 8051 microcontroller. CO3- U (6)
- Or
- (b) (i) Name the register set of 8051 and also outline how memory and I/O addressing is done in 8051. CO3- U (8)
(ii) Explain the I/O ports and their functions of 8051 microcontroller. CO3- U (8)
19. (a) (i) Describe with neat sketch, the A/D converter interfacing with 8051. CO4- U (8)
(ii) Explain the interfacing of D/A converter with 8051 microcontroller with neat diagram. CO4- U (8)
- Or
- (b) With neat diagram, outline the concepts of keyboard interfacing and RTC interfacing using I2C standard with microcontroller. CO4- U (16)
20. (a) Illustrate the architecture of arm microcontroller and also draw the pin diagram. CO5- U (16)
- Or
- (b) With neat sketch, explain the architecture of PIC microcontroller. CO5- U (16)