

University of Mumbai

Examination First Half 2022

Program: Electronics & Telecommunication Engineering

Curriculum Scheme: C-Scheme Rev-2019

Examination: SE Semester IV

Course Code: ECC 402_ and Course Name: Microcontrollers

Time: 2:30 hours

DATE: 20/5/2022

QP CODE: 91475

Max. Marks: 80

| Q1. | Choose the correct option for following questions. All the Questions are compulsory and carry equal marks |
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| 1. | Program Counter is a register that? Option A: keeps the address of instruction byte to be fetched Option B: is use to hold one of the operand for arithmetic operation Option C: keeps address of most recent entry in the stack Option D: none of the above |
| 2. | Subroutine is- Option A: a separately written program that can be Call in main program whenever it is required. Option B: used to reduce the size of the program Option C: mostly implementation using CALL and RET type of instruction Option D: All of the above |
| 3. | Microcontroller is Option A: CPU of a Computer Option B: ALU Option C: Single Chip Computer Option D: Act like a memory |
| 4. | If R0 and RS1 both bits in PSW register are 1, and R5 register is being used by the 8051, then R5 belongs to Option A: Bank 0 Option B: Bank 1 Option C: Bank 2 Option D: Bank 3 |
| 5. | Which of the following instruction needs stack memory? Option A: LJMP Option B: LCALL Option C: MOVX Option D: DAA |
| 6. | One NOP instruction can be used to generate delay of _____microsecond. if 8051 is operating on 12MHz. Option A: 1 Option B: 2 Option C: 12 Option D: None of the above |

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| 7 | Primary memory is |
| Option A: | a memory which is directly access by the CPU |
| Option B: | a Random-Access Memory (RAM) |
| Option C: | a Read Only Memory (ROM) |
| Option D: | a Hard Disc Drive in a computer |
| 8 | Which feature of an operating system enables a computer to compensate shortages of physical memory by transferring pages of data from random access memory to disk storage? |
| Option A: | Cache Memory |
| Option B: | Virtual memory |
| Option C: | Flash memory |
| Option D: | Shared memory |
| 9 | Which Chip has 11 channels 10 bit ADC |
| Option A: | 8051 |
| Option B: | NXP 89v51RD2 |
| Option C: | Atmega328P |
| Option D: | PIC16F886 |
| 10. | Watch Dog Timer (WDT) is Used to - |
| Option A: | Resets the system if applied voltage increased above threshold value |
| Option B: | Resets the system if the software fails to operate properly. |
| Option C: | Resets the system if applied voltage decreases below threshold value |
| Option D: | Resets the system if Power failure is detected |

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| Q2. | Solve any Four out of Six | 5 marks each |
| A | Describe the features of ARM processor. Also explain Which features are accepted and which are rejected from basic RISC machine. | |
| B | What is significance of CPSR register of ARM? Draw and explain each bit position. | |
| C | Explain with the help of neat diagram interfacing of single push button key to 8051 microcontroller. How you will solve key bouncing issue? | |
| D | Compare main features of 89v51RD2, PIC16F886 & Atmega 328P | |
| E | What is need of Cache memory? Explain in brief Cache organization | |
| F | What is addressing modes? Explain 8051 addressing modes with an examples. | |

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| Q3. | Solve any Two Questions out of Three | 10 marks each |
| A | Explain Interrupt Structure of 8051 microcontroller in detail. What is the role of IE, IP TCON, SCON registers in interrupt process. | |
| B | What are the factors that needs to be considered for selecting a microcontroller for an application? | |
| C | Generate square wave of frequency 1KHz at Pin 1.0 of 8051 microcontroller using delay subroutine. Assume 8051 is operating on 6MHz. | |

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| Q4. | Solve any Two Questions out of Three | 10 marks each |
| A | Draw and explain memory organization of 8051 in detail | |
| B | With the help of diagram, list the sequence of operation carried out by the microprocessor after reset to execute a program stored in a memory. Assume suitable RESET vector address. | |
| C | Explain following instruction of ARM – <ul style="list-style-type: none"> ➤ ADD R0,R2,R3,LSL#1 ➤ CMP R0,R1,LSR#7 ➤ MLA R4,R3,R7,R8 ➤ MVN R0,#4 ➤ STR r0,[r1] | |