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 Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
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

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

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.

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.

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 – ➢ ADD R0,R2,R3,LSL#1 ➢ CMP R0,R1,LSR#7 ➢ MLA R4,R3,R7,R8 ➢ MVN R0,#4 ➢ STR r0,[r1]