Q.P. Code – 42549

Fifth Semester B.Sc. Degree Examination, October/November 2019

(CBCS Scheme)

Electronics

Paper V : 8051 – MICROCONTROLLER AND INTERFACING

Time : 3 Hours] *[Max. Marks : 90*

*Instructions to Candidates : Answer any **TEN** questions from Part A, any **FIVE** from Part B, any **FIVE** from part C and any **FIVE** from Part D.*

PART – A

Answer any **TEN** questions : **(10 × 1 = 10)**

1. Among microcontroller and microprocessor, which one has less access time?
2. How will you select a register bank in 8051?
3. What is the function of program counter?
4. What is the value of SP, when reset is pressed?
5. What is the capacity of internal program memory?
6. What is the use of $\overline{\text{PSEN}}$ signal?
7. What is the function of the instruction MOV A, @ R_1?
8. What are the contents of program counter saved, when CALL instruction is executed?
9. What is the operation performed by CLRC instruction?
10. What are vectored interrupts?
11. What is the significance of $C/\overline{T}$?
12. Which port has only I/O function?

PART – B

Answer any **FIVE** questions : **(5 × 8 = 40)**

13. (a) Compare Harvard and Von-Neumann CPU architecture.

(b) Compare RISC and CISC CPU architectures. **(4 + 4)**

14. Draw the pin diagram of 8051 microcontroller and explain ALE and TXD signals. **(8)**

15. Explain the following : **(8)**

(a) Register A

(b) Register B

(c) PSW

(d) DPTR.

16. Write the addressing modes and operation performed by the following instructions : **(8)**

(a) Mov R_3 # 69

(b) Mov A, R_1

(c) Mov 66h, A

(d) Mov A, @ R_0

17. (a) Explain synchronous and asynchronous data transfer schemes.

(b) Explain the various modes of the 8051 timer briefly. **(4 + 4)**

18. (a) Compare SJMP, AJMP and LJMP instructions.

(b) Explain bit handling instructions. **(4 + 4)**

19. (a) What is a subroutine? Explain PUSH and POP instructions.

(b) List the interrupts of 8051. **(6 + 2)**

20. Draw the block diagram of 8255 and explain its modes of operation.

PART – C

Answer any **FIVE** questions : **(5 × 6 = 30)**

21. Write an ALP to copy the contents of four registers to memory locations using direct and indirect addressing modes.

22. Write an ALP to move a block of data from one location to another location.

23. Write an ALP to find the average of ten numbers.

24. Write an ALP to count from 0 to 9 with some delay.

25. Write an 8051 C program to toggle bits of port-1 to turn OFF and ON LEDs connected to the port.

26. With necessary diagram, write an ALP top interface DAC with 8051.

27. Calculate the time delay produced by the following program, if the crystal frequency is 11.0592 MHz.

	Mnemonics	Machine Cycle
	Mov R_2 # 650	1
	Mov R_3 # OA6h	1
Repeat :	NOP	1
Back :	NOP	1
	PUSH Acc	2
	NOP	1
	DJNZ R_3, back	2
	DJNZ R_2, repeat	2
	RET	2

PART – D

Answer any **FIVE** questions : **(5 × 2 = 10)**

28. Write the instructions to clear carry flag.

29. How many address lines are required to decode 4K bytes of memory?

30. Differentiate between serial and parallel data transmissions.

31. What is the difference between MOVX and MOVC instructions?

32. What are the contents of A and B, after execution of MUL AB instruction, if A = 67 h and B = A_0h.

33. What is the error in the following instructions?
    (a) MOV A, # A6h
    (b) MOV A, @ R_6.

34. What are the contents of A, if P_2 = F7h, MOV A, P_2, CLR Acc.1