E 1651 (Pages : 3) Reg. No.....

Name.....

C.B.C.S.S.—B.Sc. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Vocational Course—APPLICATIONS OF MICROPROCESSORS

(For the Vocational Subject Applied Electronics of B.Sc. Physics Model—II)

Time : Three Hours Maximum Weight : 25

Note.—(1) *Time allotted for the examination is 3 hours.*

(2) *Answer* **all** *questions in Part A, any* **five** *from Part B, any* **four** *from Part C, and any* **two** *from Part D.*

(3) *Candidates can use Scientific/non-programmable calculators/mathematical tables.*

Part A

Answer **all** *questions.*

This part contains 4 bunches of 4 objectives/one word answer type questions.
For each bunch, Grade A will be awarded if all the 4 answers are correct,
B for 3, C for 2, D for 1 and E for 0.
Weight 1 each for every bunch.

Bunch 1

Choose the most appropriate alternative.

1. In a micro-computer the control bus :

   (a) transmits and receives control signals between processor and other devices.

   (b) transmits and receives control signals and also sends and receives data.

   (c) transmits and receives control signals, send and receives data and transmits address of the device.

   (d) None of the above.

2. The accumulator in 8051 is ——— bit register.

   (a) 8. (b) 16.

   (c) 6. (d) 32.

3. The size of ROM in 8051 is ———.

   (a) 1K byte. (b) 2K byte.

   (c) 4K byte. (d) 8K byte.

4. The call location for the interrupt RST 6.5 is :

   (a) 0024. (b) 002C.

   (c) 0034. (d) None of the above.

Turn over

Bunch 2

Choose the most appropriate alternative.

5. The address bus of 8085 is 16 bit wide and hence the memory which can be accessed by this address is ———.

   (a) 2K bytes. (b) 4K bytes.

   (c) 16K bytes. (d) 64 K bytes.

6. In a microprocessor the address of the next instruction to be executed is stored in ———.

   (a) Stack pointer. (b) Address latch.

   (c) Program counter. (d) General purpose register.

7. The LEDs for their display require :

   (a) a voltage of 1.2 V and a current of 20 mA.

   (b) a voltage of 25 V and a current of 20 mA.

   (c) a voltage of 25 V and a current of 100 mA.

   (d) a voltage of 1.2 V and a current of 100 mA.

8. The non-maskable interrupt of 8085 is :

   (a) RST 7.5. (b) RST 6.5.

   (c) INTR. (d) None of the above.

Bunch 3

State whether the following are True **or** *False.*

9. When an 8085 system is reset, all the interrupts including the TRAP are disabled.

10. The 8051 has three timer registers.

11. 16 bit data memory can be generated through DPTR data pointer register.

12. 8051 contains 512 bytes of data memory.

Bunch 4

Fill in the blanks using appropriate words.

13. Timers of 8051 can operate in four modes which can be selected by ——— register.

14. The internal data memory space of 8051 is divided into three banks of lower 128 bytes, upper 128 bytes and ———.

15. The asynchronous data transfer is normally implemented using a logic called ———.

16. When an I/O device becomes ready to transfer the data, it makes the ——— pin of microprocessor as "high".

(4 × 1 = 4 weights)

Part B (Short Answer Type Questions)

Answer any **five** *questions.*
Each question carries a weight of 1.

17. What is an interrupt ? How does is transferred between CPU and I/O devices using interrupts ?
18. What type of data transfer schemes are used if the speed of I/O devices do not match with the CPU ? Explain.
19. How multiple interrupts can be resolved using a priority encoder ?
20. Explain the functions of the following pins of 8051 :—
    (i) $\overline{\text{PROG}}$. (ii) $\overline{\text{PSEN}}$.
    (iii) $\overline{\text{EA}}$. (iv) TXD.
21. Explain the modes of counters of 8051.
22. Define the following instructions with reference of 8051 :—
    (i) XRL A, @ R_1. (ii) MOV DPTR, #data 16.
23. Explain the memory system of 8051.
24. Distinguish between LJMP and SJMP.

(5 × 1 = 5 weights)

Part C (Short Essays/Problems)

Answer any **four** *questions.*
Each question carries a weight of 2.

25. Explain the functioning of SWAP A with an example.
26. Explain different flags and the PSW of 8051 microcontroller.
27. Describe the jump and call program ranges in 8051.
28. Explain (i) software-polled time and (ii) software-time delay generation with reference to 8051.
29. Write a 8085 program to generate 1 kHz square wave.
30. Describe a temperature control scheme using microprocessor.

(4 × 2 = 8 weights)

Part D (Essay Type Questions)

Answer any **two** *questions.*
Each question carries a weight of 4.

31. Design a system using 8255 to read the status of 8 switches and display the digit on a 7 segment display. Write the program for the same.
32. With a detailed functional block diagram, explain the architecture of 8051.
33. Explain 8051 based system design with respect to reset and clock circuits, expanding I/O and memory address decoding.

(2 × 4 = 8 weights)