Instruction : (1) **All** Questions are **compulsory**.
   (2) Illustrate your answers with neat sketches **wherever** necessary.
   (3) Figures to the **right** indicate **full** marks.
   (4) **Assume** suitable data, **if** necessary.
   (5) **Use** of Non-programmable Electronic Pocket Calculator is **permissible**.

1. (a) Attempt any **THREE** of the following: **[12]**
      (i)   State the difference between Harvard and Von Neumann architecture with suitable diagram.
      (ii) List features of 8051.
      (iii) Draw and explain TCON reg.
      (iv) Explain following instructions :
            (1) XCH A, @ Ri
            (2) CJNE A, direct rel.
            (3) SJMP addr
            (4) LJMP addr.
      (v)   What is BUS? Explain different types of buses used in 8051.

    (b) Attempt any **ONE** of the following :   **[6]**
      (i) Draw the interfacing of 2KB of EPROM & 2kB of RAM to 8051 along with its memory map.
      (ii) Write an assembly language program to exchange ten bytes of data from source location 40H to destination location 60H, for 8051 microcontroller.

2. Attempt any **FOUR** of the following :   **[16]**
    (a) Describe the function of following pins of 8051
      (i) $\overline{PSEN}$ (ii) ALE
      (iii) $\overline{EA}$ | VPP   (iv) RST
    (b) Draw internal RAM organization of 8051 and explain.
    (c) Explain different timer modes in 8051.
    (d) Explain different serial communication modes of 8051.
    (e) Draw and explain the format of SCON reg.
    (f) Explain following directing with example
      (i)   ORG   (ii) EQU
      (iii) DB   (iv) Code

3. Attempt any **FOUR** of the following :   **[16]**
    (a) Draw and explain power saving options of 8051.
    (b) State the function of editor, assembler, compiler and linker.
    (c) Write assembly language programe to transfer msg 'MIC' serially at the band rate of 4800 with 8 data bits and 1 stop bit do it continuously.
    (d) Draw interfacing diagram showing 4×4 matrix keyboard connection to Port 2 and port 1 of 8051. Draw flow chart to detect pressed key.
    (e) Draw the circuit diagram at port 0 of 8051 and describe its functions.

4. (a) Attempt any **THREE** of the following: **[12]**
      (i) List all alternate functions of port3 of 8051.
      (ii) What values should be loaded in TH1 of 8051 microcontroller to obtain 4800

Baud rate ? Assume crystal frequency = 11.0592 MHz. Give answer in both decimal and Hex.

(iii) Write an assembly language program for 8051 microcontroller to add five 8-bit numbers. stored in internal RAM from 20H onwards. Store the result at 30H

(iv) Draw Block diagram of 8255. Discuss the operating modes of it.

(b) Attempt any **ONE** of the following :   **[6]**

(i) Draw interfacing diagram of stepper motor with 8051 microcontroller and write ALP to rotate in anticlockwise direction through 180°. Assume step angle 1.8°.

(ii) Draw interfacing diagram of 8051 microcontroller with 8255. State I/O port address and control word register address.

5. Attempt any **FOUR** of the following :   **[16]**

(a) Differentiate between linear and absolute address decoding.

(b) Write an assembly language programme for 8051 microcontroller to turn on led connected to P1.7 on the occurrence of $\overline{INT0}$ and turn off LED after some delay.

(c) Describe any four selection factor at microcontroller.

(d) List priority at interrupts along with their vector add. How it can be changed.

(e) Explain different addressing modes with one example each

6. Attempt any **FOUR** of the following :   **[16]**

(a) Write assembly language program to generate continuous sq. wave of 2KHz an P1.4 using timer 0. Assume crystal freq. = 11.0592 MHz.

(b) Write an assembly language program to arrange ten numbers in an ascending order.

(c) Sketch block diagram of microcomputer and explain.

(d) Draw and explain IE reg. of 8051.

(e) A switch is connected to P1.0 and LED to P2.7. Write a program to get the status of the switch and saved it to LED.

Paper Discussion Schedule for T.Y. Diploma (Sem. V) – All Subjects

Date	Day	Timing	Centres
14 Nov. 2016	Monday	9 a.m. to 11 a.m.	Dadar
14 Nov. 2016	Monday	12 p.m.to 2 p.m.	Thane

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