I/E/TX

Final Assessment Test – May 2024

VIT®
Vellore Institute of Technology

Course: **BECE204L - Microprocessors and Microcontrollers** Slot: **B2+TB2**

Class NBR(s): **1325 / 1330 / 1333 / 1454 / 1456 / 1458** Max. Marks: **100**

Time: **Three Hours**

- **KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE**
- **DON'T WRITE ANYTHING ON THE QUESTION PAPER**

Answer ALL Questions

(10 X 10 = 100 Marks)

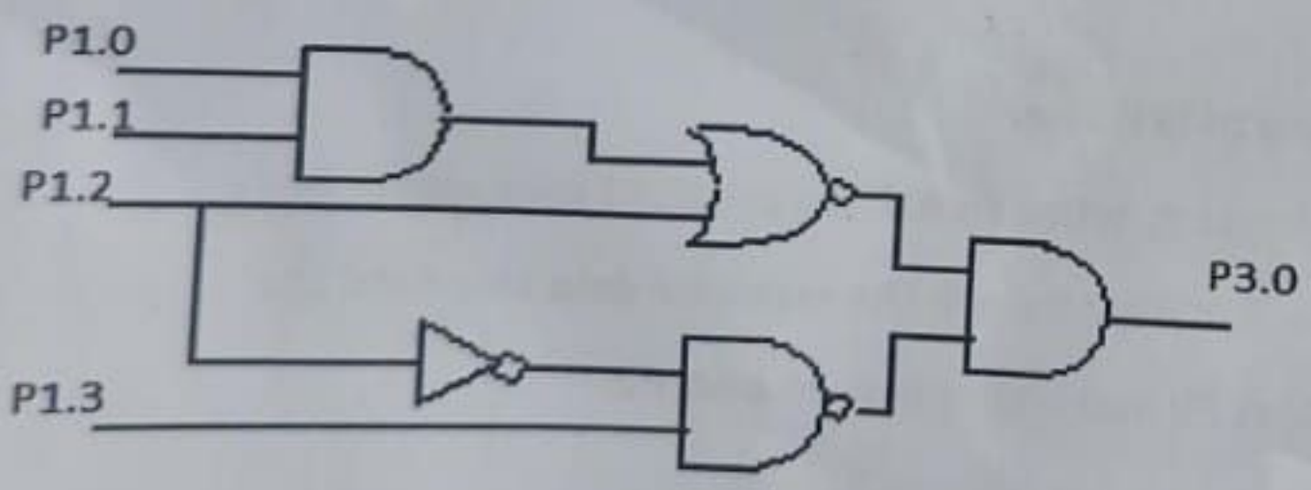
1. (i) Differentiate between Microprocessor and Microcontroller with example. **[5]**
   (ii) Mention the criteria's for choosing a microcontroller for developing an embedded product. **[5]**

2. Explain with suitable diagram the bus interface and execution unit of 8086 processor.

3. Show the contents of various locations after executing each and every instruction of the following code.

Line No	Program	Data in RAM
1.	MOV 28H,#4BH	28H : ; SP :
2.	MOV 0FH,#3EH	0FH : ;SP :
3.	MOV 1FH,#5CH	1FH : ; SP :
4.	MOV SP, #49H	SP :
5.	PUSH 28H	28H : ; SP :
6.	PUSH 0FH	0FH : ; SP :
7.	PUSH 1FH	1FH : ; SP :
8.	POP 3CH	3CH : ; SP :
9.	POP 4DH	4DH : ; SP :
10.	PUSH 4DH	4DH : ; SP :
11.	POP 5FH	5FH : ; SP :
12.	END	

4. Develop an assembly code for 8051 microcontroller, to implement the digital circuit as shown in figure.



5. Develop an ALP for 8051 Microcontroller to initiate with counter 1 in mode 2. When the count reaches 25, turn on the buzzer for 1 second which is connected in port pin P1.2.

6.(a) Write an 8051 ALP to monitor the received character from serial port at 4800 baud rate. If the received character is 'L' then generate a waveform of 25% duty cycle. If the received character is 'H' then generate a waveform of 75% duty cycle at pin P1.0. The crystal frequency is 11.0592 MHz.

OR

6.(b) Write an 8051 assembly language program to get the data from Port P0 and send it to Port P1 continuously, while the interrupts will do the following, (Assume XTAL freq = 11.0592 MHz)

(i) Keep transmitting the data 'SAVE WATER' continuously through the serial COM port with 2400 baud rate.

(ii) Whenever there is a falling edge at P3.3 (INT1) buzzer at P0.4 for some time.

7. Develop an 8051 assembly program for the below LCD display [2 rows, 16 characters]. Assume "VITVELLORE" is stored in ROM starting from 200H. Bring the characters that is to be displayed in LCD from ROM location starting at 200H

											R	L	E	T	V

Reference:

01 – clear display

38 – 2 lines 5X7 matrix

0E – Display ON cursor blinking

06 – Increment cursor

04 – Decrement cursor

80 – Force cursor to beginning of first line.

8.(a) With a suitable interfacing diagram, write an ALP for the 8051 microcontroller to get 8 bit digital data from ADC804. Square the received data and send the lower byte of the result to port P0 and higher byte to port P2.

OR

8.(b) With suitable DAC interfacing diagram with 8051 microcontroller, write a program to generate a waveform as shown below. The pattern should be repeated continuously.

9. Discuss the different processor modes of ARM 7 processors with neat sketches describing their register banks.

10. Explain the different categories of instruction set in ARM 7 with example for each category.

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