**Unit -II**

**The 8051 Microcontrollers, 8051 Programming in ‘C’**

**(Question Bank)**

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| 1 | Differentiate between Microprocessor and Microcontroller. |
| 2 | List out some embedded products using microcontrollers. |
| 3 | List and explain in brief the criteria for choosing a microcontroller. |
| 4 | With a neat diagram, explain the PSW register of 8051 microcontroller. |
| 5 | With a neat diagram, explain the internal RAM organization of 8051 microcontroller. |
| 6 | Calculate the machine cycle frequency and time period for the XTAL frequency given below:   1. 11.0592 MHz 2. 22 MHz 3. 12 MHz 4. 16 MHz |
| 7 | List and explain the various data types of 8051 in ‘C’. |
| 8 | Write an 8051 C program to send values 00 – FF to port P1. |
| 9 | Write an 8051 C program to send hex values for ASCII characters of 0, 1, 2, 3, 4, 5, A, B, C, and D to port P1. |
| 10 | Write an 8051 C program to toggle all the bits of P1 continuously. |
| 11 | Write an 8051 C program to send values of –4 to +4 to port P1. |
| 12 | Write an 8051 C program to toggle bit D0 of the port P1 (P1.0) 50,000 times. |
| 13 | Which are the two different approaches to generate delay? Discuss the various factors associated with delay generation. |
| 14 | Write an 8051 C program to toggle bits of P1 continuously forever with some delay. |
| 15 | Write an 8051 C program to toggle bits of P1 ports continuously with a 250 ms. |
| 16 | Write an 8051 C program to get a byte of data form P1, wait ½ second, and then send it to P2. |
| 17 | Write an 8051 C program to get a byte of data form P0. If it is less than 100, send it to P1; otherwise, send it to P2. |
| 18 | Write an 8051 C program to toggle only bit P2.4 continuously without disturbing the rest of the bits of P2. |
| 19 | Write an 8051 C program to monitor bit P1.5. If it is high, send 55H to P0; otherwise, send AAH to P2. |
| 20 | A door sensor is connected to the P1.1 pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound the buzzer by sending a square wave of a few hundred Hz. |
| 21 | Write an 8051 C program to turn bit P1.5 on and off 50,000 times. |
| 22 | Write an 8051 C program to get the status of bit P1.0, save it, and send it to P2.7 continuously. |
| 23 | List out the various logical operators and bit wise operators of 8051 in ‘C’. |
| 24 | Write an 8051 C program to toggle all the bits of P0 and P2 continuously with a 250 ms delay. Using the inverting and Ex-OR operators, respectively. |
| 25 | Write an 8051 C program to get bit P1.0 and send it to P2.7 after inverting it. |
| 26 | Write an 8051 C program to read the P1.0 and P1.1 bits and issue an ASCII character to P0 according to the following table.  P1.1 P1.0  0 0 send ‘0’ to P0  0 1 send ‘1’ to P0  1 0 send ‘2’ to P0  1 1 send ‘3’ to P0 |
| 27 | Write an 8051 C program to convert packed BCD 0x29 to ASCII and display the bytes on P1 and P2. |
| 28 | Write an 8051 C program to convert ASCII digits of ‘4’ and ‘7’ to packed BCD and display them on P1. |
| 29 | Write an 8051 C program to calculate the checksum byte for the data 25H, 62H, 3FH, and 52H. |
| 30 | Write an 8051 C program to perform the checksum operation to ensure data integrity. If data is good, send ASCII character ‘G’ to P0. Otherwise send ‘B’ to P0. |
| 31 | Write an 8051 C program to convert 11111101 (FD hex) to decimal and display the digits on P0, P1 and P2. |