

Faculty of Engineering & Technology
Eighth Semester B.E. (Electronics)/EDT Examination
EMBEDDED SYSTEMS
Sections—A & B
Elective—II

Time—Three Hours]

[Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
- (2) Answer **THREE** questions from Section A and **THREE** questions from Section B.
- (3) Assume suitable data wherever necessary.
- (4) Illustrate your answers wherever necessary with the help of neat sketches.

SECTION—A

1. (a) Often the SEI mask command is used at the beginning of a program containing interrupts. Why ? 6
- (b) Explain the clock generation module with suitable diagram. 7
2. (a) What are the three normal operating modes available for use in 68HC12 ? 7
- (b) Explain the maskable interrupts of μ c 68HC12. 7
3. (a) Explain the addressing modes of 68HC12 with suitable example. 6
- (b) Explain the SPI control register of 68HC12 in detail. 7

4. (a) Write a program to create a time delay of 100 second by using program loop. 7
- (b) Explain the following instruction :
- (i) MUL (ii) EDIV
 (iii) IDIVS (iv) Idaa
 (v) add d (vi) adca. 6
5. (a) Write a short note on WHYP and also mention the WHYP logical operators. 6
- (b) Explain the branch instructions with example :
- (i) BCC (ii) BVS
 (iii) BPL (iv) LBRA
 (v) BGT. 7

SECTION-B

6. (a) Explain the 68HC12 ATD control register 5 and ATD status register in detail. 10
- (b) If $V_{RH} = 0.4 \text{ V}$ and $V_{RL} = 1.0 \text{ V}$, what digital value is returned when the ATD system converts the following voltage using 8-bit conversion :
- (i) 5.0 V (ii) 0.0 V
 (iii) 2.5 V (iv) 1.5 V
 (v) 3.5 V. 4
7. (a) Explain the MOSI, MISC and SS signals during the SPI function in 68HC12. 7
- (b) What is the function of a port replacement unit with the 68HC12 microcontroller. When do we use it ? 6
8. (a) Explain in detail the RTC and CALL of 68HC12. 6

- (b) How do we use the watchdog timer in 68HC12 ? How do we disable a watchdog timer feature in a program ? When do we need disabling ? 7
9. (a) Explain the SCI status register 1 and control register 1 ? 6
- (b) How can we rotate an antenna axis in the direction of incoming signal using μC . Design a suitable interface circuit and write appropriate code for 68HC12 ? 7
10. Write short notes on (any two) :
- (a) Features of 68HC12
 (b) Master slave SPI modules of μC 68HC12
 (c) Stack Manipulation words. 13

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