Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70526

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Seventh/Eighth Semester

Electronics and Communication Engineering

EC 8791 – EMBEDDED AND REAL TIME SYSTEMS

(Common to Biomedical Engineering/Medical Electronics)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enumerate the services to be provided by consumer electronics.

2. What is the significance of UMI language for Embedded system design? Give an example.

3. What is the difference between PCLK and CCLK?

4. What is the concept and need for mode switching?

5. Draw the schematic of DFG and CDFG with an example.

6. Mention the features of program optimization in embedded system.

7. What is dynamic priority algorithm? State its advantages and applications.

8. What are sporadic and aperiodic tasks? Give examples.

9. What is the significance of Shared memory multiprocessors?

10. Enumerate the major function of POSIX RTOS.

PART B — (5 × 13 = 65 marks)

11. (a) What is CRC? Explain the system analysis and architecture design using CRC card Layout?

Or

(b) Design an Alarm clock and explain the various steps involved in the design of computing system with diagrams.

12. (a) Explain the general structure of an Assembly language line and brief about directives used in ARM with examples of each directive.

Or

(b) The content of registers is given as below

R1 = 0xEF00DE12,

R2 = 0x0456123F,

R5 = 4, R6 = 28,

What is the output result in the destination register when the following instructions are executed?

(i) LSL R1, #8

(ii) ASR R1,R5

(iii) ROR R2,R6

(iv) LSR R2,#5

13. (a) Explain in detail about the assembly linking and loading in Embedded system programming, with examples.

Or

(b) Write technical notes on (i) stream-oriented programming (ii) circular buffer.

14. (a) What are the features of information redundancy? Elucidate its principle to obtain a code that will correct multiple bit errors, with example.

Or

(b) Bring out the mathematical concepts of Identical Linear Reward functions in Uniprocessor scheduling.

15. (a) What is the purpose of Priority based scheduling? Discuss in detail with appropriate diagrams.

Or

(b) Enumerate the features and applications of EDF Algorithm. Write the EDF algorithm for scheduling three process with hyper period 60.

PART C — (1 × 15 = 15 marks)

16. (a) Write a symbol table for the following code snippet and explain the procedure in detail.

```
ORG 100

label1 ADR r4,c

LDR r0,[r4]

label2 ADR r4,d

LDR r1,[r4]

label3 SUB r0,r0,r1
```

Or

(b) Explain the control registers of PWM unit with diagrams. Determine the values to be entered in the PWMPCR register for the following cases.

(i) Single edge control for PWM3

(ii) Double edge control for PWM3.

(iii) Single edge control for PWM1, 2 and 3.

———————