Register No.: …………………………… Name: ……………………………………………………………

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), DECEMBER 2022
VLSI AND EMBEDDED SYSTEMS
(2021 Scheme)

Course Code: 21VE103

Course Name: Design with ARM Microcontrollers

Max. Marks: 60   Duration: 3 Hours

PART A
(Answer all questions. Each question carries 3 marks)

1. List the classifications of embedded system
2. Describe triangulation method of range finding.
3. Distinguish between compiler and assembler.
4. Draw the bit structure of a Current Program Status Register.
5. Describe Software Interrupt instruction SWI with its importance.
6. List out the benefits of conditional execution of instructions in ARM processor.
7. Calculate the value of PWMMR0 and PWMMR3 to get a pulse train of 10ms and duty cycle of 50%.
8. Illustrate the operation of the timer unit with block diagram.

PART B
(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. What do you mean by Embedded Systems Design and Development Lifecycle Model? Explain waterfall model. (6)

OR

10. Explain the features of embedded system. (6)

MODULE II

11. Explain the principle of data storage in flash memory. Differentiate between NAND and NOR flash structure. (6)

OR

12. Draw and explain the functional block diagram of Microchip MPC3008 (6)

MODULE III

13. Describe the steps in converting source file to an executable file with suitable examples. (6)

OR

14. With neat sketches, explain briefly how to download hex file to non-volatile memory.. (6)

MODULE IV

15. List out the important features that make the ARM ideal for embedded Applications. (6)

OR

16. Compare AHB, ASB & APB buses of AMBA Bus system of ARM Architecture. (6)

MODULE V

17. Write the operation of following instruction
i) STMFDsp!,{r1,r4}   ii) LDR r0,[r1],#0x4
iii) STR r14,[r13, #-4]! (6)

OR

18. How thumb instruction set improve code density? Justify with an example. (6)

MODULE VI

19. Write a program to design a timer for generating a symmetric square wave at pin P1.16 of an LPC214x MCU, using Timer 0. (6)

OR

20. Write a program for serially receiving a character at a baud rate of 9600. (6)

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