Hall Ticket Number:

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD **Code No. : 16641 O**

Accredited by NAAC with A++ Grade

B.E. (I.T.) VI-Semester Backlog Examinations, May/June-2023

Embedded Systems and IoT

Time: 3 hours Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	List the different registers available in 8051.	2	1	1	1
2.	At what memory address the 8051 controller wakes up when it is powered on?	2	1	1	1
3.	What is the purpose of R13, R14 and R15 registers in ARM7?	2	1	2	1
4.	Give the bit configuration of CPSR register of ARM7.	2	1	2	1
5.	What are re entrant functions with respect to RTOS?	2	1	3	1
6.	What can be the different problems that occur when using semaphores?	2	2	3	1,2
7.	List the different categories of multi processor systems.	2	1	4	1
8.	What is the role of accelerator in embedded system design?	2	1	4	1
9.	List the different steps in IoT system design.	2	2	5	1
10.	What are the basic building blocks of an IoT device?	2	1	5	1

Part-B (5 × 8 = 40 Marks)

11. a)	Discuss the different addressing modes available in 8051 with relevant example.	4	2	1	1
b)	Write an assembly program to copy a block of 10 bytes of data from RAM locations starting at 35H to RAM locations starting at 60H.	4	3	1	3
12. a)	Explain in detail the different modes of operation of ARM7.	4	2	2	1
b)	Explain what happens using the below instruction in ARM7 LDMIA R7! {R0-R7}.	4	2	2	1
13. a)	List the differences between a desktop operating System and a Real time Operating system.	4	2	3	1
b)	Write a C program demonstrating the use of timing functions of VxWorks.	4	3	3	3

Contd... 2

Code No. : 16641 O

14. a)	Explain the different multiprocessor architectures with neat illustrations.	4	2	4	1
b)	Give the definition and important characteristics of IoT.	4	2	4	1
15. a)	List the differences between IoT and M2M.	4	2	5	1
b)	Explain the different IoT deployment levels with an application example for each.	4	3	5	1
16. a)	Assuming crystal frequency as 11.0592MHz, write a ALP to generate a square wave of 2kHz frequency on pin P1.5. Use Timer 1 in mode1 operating mode.	4	3	1	2
b)	List and indicate the operation of various compare instructions available in ARM7.	4	3	2	1
17.	Answer any ***two*** of the following:				
a)	What is the problem of priority inversion? How can you avoid it using an RTOS? Explain using an illustration.	4	3	3	2
b)	List the differences between I2C and CAN protocols.	4	3	4	1
c)	Write a python program for blinking red LEDs on a raspberry pi board.	4	3	5	3

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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