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### RV COLLEGE OF ENGINEERING®

(An Autonomous Institution Affiliated to VIII) 111 Semester B. F. Examinations April/May-2023

## Artificial Intelligence and Machine Learning

## FOUNDATIONS OF CYBER PHYSICAL SYSTEM

### Time: 03 Hours

Maximum Marks: 100

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only

Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7

#### PART-A

	1 1.1	Home		
		now registers		
	1.2	Data Many are useful in a process		
l		How registers are useful in a processor?  Data Management Module is a bridge between and	1	
I		WILLIAM TO A TOTAL A	0.1	
l	1.3	What is Firmware?		
l	1.4		0.	
l	1.5	is the fastest for	0.1	
l		Write the significance of Decision Support System in CPS applications.  List the key requirements of the environmental CPS.	0.1	
l	1.6	List the key requirements of the environmental CPS applications.  Static PAM.	0.1	
	1.7	The Key requirements of a support System in CPS another	0.1	
		Define a System Bus the interest of the environmental che	0.2	
	1.8	Static PAN (or Bus.		
	1.9	THE RAM (SRAM) uses	0.1	
		Static RAM (SRAM) uses How Smart Sensors are different from Sensors are different from Sensors.	0.1	
	1.10		0.	
	1.11	Differentiate memory mapped 10 and port 10.  Memory the properties of the properties	0.1	
		now data is erased from and port 10.	101	
		MICHOIV (EDDOMAS UIC Erasable in	01	
	1.12	What are the Read Only	O.	
		What are the common short-range communication technologies used List the advantages of Compression	1	
		In Smart Homes Short-range communication	0.1	
	1.13	List the advantages of Compressive Sensing.	100	
	- TI 14	we die advantages of Compression		
	. (/ 1.14	Write the example of the ressive Sensing	0.1	
	1.13 \$\infty\$1.14 \$\infty\$1.15	Write the examples for parallel architectures.  List the application classification of Cognitive Radio Sensing  Highlight the primary 1	0.1	1
		application classification		
		Networks. Canada of Cognitive Parks of	0.1	1
	1.16	Highlight the primary design considerations of WSNs.  Name the CPU used by the Stero Viving To Read Sensing		ı
			0.5	l
	1.17	Name the CPU used by the St.	0.2	l
	1.18	Name the CPU used by the Stero Vision Tracking Systems.  Give the example for low-speed	01	1
	0	dive the example for low-speed world	01	
		Give the example for low-speed serial communication used in Embedded Systems.	0.1	ı
		and the		
			0.1	

#### PART-B

2 a	Discuss three-tier Cyber Physical System (CPS) architecture and advance CPS architecture in detail.	
Ь	Illustrate the conceptual overview of the Health and Medical Sciences CPS.	08
3 a	Compare Desktop, Complex Embedded and Simple Embedded software layers.  Summarize parallel architectures by highlighting the salient features.	08
	OR	

		bing architecture and Harvard	
4	a	Differentiate VonNeumann machine architecture and Harvard	08
*:	a		08
	b	architecture.  Describe embedded computer architecture in detail.	
		List and discuss various sub-systems in Stereovision Tracking	00
5	a	List and discuss various sub-sy	08
		System. Compare VME and PCI 2.x buses.	0.8
	b	Compare VME and VCV E.X Buses	
	-10	OR	
		used in Stereovision Tracking	
6	а	Discuss the hardware components used in Stereovision Tracking	08
		System.	08
	b	System.  With a neat sketch, discuss the memory sub-system.	0.0
		Discuss OODA architecture by considering agriculture CPS.	08
7	a	Discuss <i>OODA</i> architecture by considering agriculture of Summarize the characteristics and applications of Cognitive Radios Summarize the characteristics are useful in smart cities.	08
	b	Summarize the characteristics and approximation $(CR)$ . Also analyze how $CR's$ are useful in smart cities.	
		OR	20
		is at an in CPS.	08
8	а	Discuss the sensor classification in CPS.  Discuss the sensor classification in CPS.  Mobile Sensing Network and CPS.	00
0	b		
		and Fully Autonomous Robotic Tubi	08
9	a	Illustrate a Teleoperated and Fully Autonomous Robotic Task Control Loops.  Discuss the structure of the Planar LED along with the applications.	08
		Loops.	
	b	NV .	
4	3	Distributatio Stepper	
	/	t tractors by considering Electrostatic Stepp	08
		Illustrate Electrostatic Actuators by considering Electrostatic Stepper Motor.  Summarize the concept of Basic Feedback Control Arm Positioning in Robotic System.	00
10	а	Motor	08
		Summarize the concept of	
	Ь	a Robotic System.	