



BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Tech.(ME)-2021
Course Name – Mechatronics
Course Code - PCC-ME602
(Semester VI)

Full Marks: 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) Choose the correct alternative from the following: (i) A servo motor is a typical example of ____ b) Mechanical system a) Electronics system d) Mechatronics system c) Computer system (ii) The main function of Actuator is _____ b) Detect input a) To produce motion d) Detect the state of the system c) Detect output (iii) Example of 'Stand-alonesystem' is _____ b) Washing machine a) Machining centres d) Automated inspection stations c) Robots for parts handling (iv) A humanoid robot is an example of ____ a) Artificial intelligence b) Stand-alone systems d) High level distributed sensor c) Large factory systems microcontroller actuator (y) The first aspect that needs to be considered in the Mechatronics design process is a) Hardware integration and simulation b) Conceptual design c) Mathematical modeling d) Modeling and simulation (vi) Microprocessor based electrical motors are used for a) Prediction of fault in the system b) Correction before a fault occurs c) Actuation purpose in robots d) Providing intelligence (vii) Describing the behavior characteristics through block diagram is done in _____ a) Modeling and simulation b) Prototyping c) Deployment d) Design optimization (viii) Identify what converts physical input into output, among the basic parts of a measuring system? a) Transducer or sensor b) Signal conditioning c) Intelligence d) Display

1 x 15=15

	(IX) Choose the following is a false statement rega	rding Wechatrome system	
	a) Its initial cost of setup is high	b) Does not require highly skilled I operating it	
	c) More output in less time d) It provides flexibility in production (x) Choose among the following is a correct statement regarding "Mechatronic system"		
	 a) Its initial cost of setup is low c) More output in less time (xi) Identify error that is also termed as measurem 	b) Cheaper maintenanced) Any individual can operate these	
(a) Static errors c) Systematic errors (xii) The applications of PLC in mechatronics are	b) Dynamic errors d) Statical error	
	 a) Timing, counting, logic, arithmetic and sequencing 	b) Storing data	
()	 c) Managing, commanding and directing xiii) Choose the following buses are present in a minone place to another 	d) Processing icrocontroller for transferring data fro	m
(>	a) data bus only c) address bus only kiv) If we push data onto the stack then the stack p	b) data bus, address bus d) address bus, data bus, control bu pointer	ıs
	a) increases with every push c) increases & decreases with every push xv) "DJNZ RO, label" is byte instruction.	b) decreases with every push d) none of the mentioned	
	a) 2 c) 1	b) 3 d) Can't be determined	
	Grou (Short Answer Ty	•	3 x 5=15
	Explain the specifications of transducers. Explain briefly about Thermocouple.		(3) (3)
4. Describe the key elements of a mechatronics system.5. Explain the challenges that are associated with the miniaturization and integration of microsensors in mechatronic systems			
6.	Compare microprocessor and microcontroller.		(3)
	OR	•	
	Illustrate various features of 8051 microcontroller.		(3)
	Group	D-C	
	(Long Answer Typ		5 x 6=30
7.	Explain about the measurement system with an practical example.		(5)
8.	Illustrate the classification of transducers.		(5)

9. Explain briefly about Potentiometer.	(5)	
10. Develop the architecture of 8051 microcontroller using a block diagram.	(5)	
11. Write some of the challenges faced in implementing a Mechatronics system in a manufacturing setting and how can they be addressed.		
12. Explain the role of mechatronics in advance manufacturing.	(5)	
OR Explain how microsensors are integrated into mechatronic systems for feedback control and condition monitoring.	(5)	
