Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Supplementary Examination August 2021

Course Code: EC465

Course Name: MEMS

Max. Marks: 100   Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.   Marks

1	a)	Describe the working principle of pressure sensor with neat sketches.	(7)
	b)	Explain the operation of thermal sensors and actuators with neat diagrams.	(8)
2	a)	Describe the working principle of micro accelerometer with neat schematic diagrams.	(7)
	b)	Discuss the working principle of electro static sensors and actuators.	(8)
3	a)	Explain the operating principle of two types of micro motors with suitable schematics.	(8)
	b)	Evaluate different types of flexural beams and boundary conditions that are encountered in MEMS.	(7)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Explain Trimmer Force Scaling Vector. Analyze the scaling equations for Acceleration, time and Power Density in terms of force scaling vector.	(8)
	b)	Explain the steps involved in photolithography. State the chemicals used in each Stage.	(7)
5	a)	Analyze the expressions for electromagnetic potential energy and force with reference to scaling of electromagnetic forces.	(7)
	b)	Discuss the properties of PDMS and PMMA with neat diagrams.	(8)
6	a)	Explain the scaling in fluid mechanics .What are the advantages of piezoelectric pumping.	(8)
	b)	Explain the working principle Chemical Vapor Deposition used for obtaining Silicon Nitride thin film over silicon substrate.	(7)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Explain surface micro machining process with neat sketches.   (10)

   b) Differentiate between Anodic bonding and Silicon Fusion Bonding.   (10)

8 a) Describe the process of Micro stereo lithography with neat sketches.   (10)

   b) Explain with figures two applications which use RF MEMS technology.   (10)

9 a)   Explain the general considerations in packaging of MEMS system design.   (10)

   b)   Explain the different stages in Sealing of micro systems.   (10)

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