Q. P. Code : 36790

(3 Hours) (Total Marks: 80)

Please check whether you have the right question paper.

N.B.: **1)** Question No.1 is compulsory.
2) Answer any Three out of remaining five questions
3) Draw the neat diagrams wherever necessary.

Q1.

A]	What is MEMS? Give two examples of MEMS devices which are characterized by sensors and actuators.	**5**
B]	What are polymers? Discuss its role in MEMS fabrication.	**5**
C]	Explain the steps in standard RCA cycle, during wafer cleaning.	**5**
D]	Explain packaging challenges in MEMS devices.	**5**

Q2.

A]	What are different silicon compounds. Explain their characteristics and uses in MEMS device fabrication.	**10**
B]	State various physical vapor deposition techniques. Explain in brief any one technique of PVD in MEMS fabrication.	**10**

Q3.

A]	Explain the process of photolithography in detail.	**10**
B]	Distinguish between Wet and Dry etching process with suitable applications.	**10**

Q4.

A]	Describe the representative process flow for fabricating the cantilever structure.	**10**
B]	Define reliability in MEMS devices. Explain it using bath-tub-curve.	**10**

Q5.

A]	Explain in detail, fabrication steps for MEMS microheater.	**10**
B]	Differentiate between surface and bulk micromachining with suitable examples.	**10**

Q6. Write short note on: **20**
A] MEMS sensors in IoT applications.
B] Selection of MEMS material based on applications.
C] Wafer bonding techniques.
D] MEMS device characteristics.
