

Q.P. Code :08594

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Q.1 is compulsory.
 2. Attempt any three out of remaining questions.
 3. Assume suitable data wherever required.

- Q.1 a) Explain various micro – actuation techniques pertaining to MEMS technology. 20
 b) Explain the role of MEMS sensors in IoT.
 c) Define TCR, thermal conductivity and its significance with respect to MEMS devices.
 d) Explain DRIE in detail.
- Q.2 a) Explain fabrication steps of thermal Ink – jet printer head by Hewlett – packard and explain its ink – firing sequence. 10
 b) What do you understand by high aspect ratio MEMS? Explain fabrication process flow for HARMEMS. 10
- Q.3 a) How MEMS pressure sensor converts pressure into its equivalent electrical parameter, explain with its schematic representation and fabrication process steps. 10
 b) Define reliability? Draw and explain bath – tub – curve, describing MEMS devices reliability. 10
- Q.4 a) Differentiate between surface and bulk micromachining for fabrication of MEMS devices with suitable example. 10
 b) “Silicon based microelectronics is different than MEMS fabrication” Justify the statement. 10
- Q.5 a) What are polymers? Discuss role of SU8 and PMMA polymers in MEMS applications. 10
 b) List out various silicon compounds. Explain their characteristics and uses in MEMS device fabrication. 10
- Q.6 Write short note on (any two) 20
 a) Wire bond techniques
 b) MEMS accelerometer
 c) Lithography (any one type in detail)
