

M. Tech. (Nano Technology) Sem-III (CBCS – 2015 Course) :
SUMMER - 2019

SUBJECT: ELECTIVE-I b) NANO ELECTRONICS

Day: Friday
Date: 17/05/2019

S-2019-3352

Time: 11.00 AM TO 02.00 PM
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Answer to both the sections should be written in **SAME** Answer book.
 - 4) Draw suitable diagrams wherever required.
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SECTION-I

Q.1 Explain with details, the suitability of 'nanosilicon' for fabrication of SETs. **(10)**

OR

Explain the quantum mechanical tunneling. State its applications in tunneling transistors.

Q.2 List various state of the art compound semiconductor optoelectronic materials and devices with novel properties. **(10)**

OR

What are optical and radiation sensors? Add a note on their applications in various fields.

Q.3 Explain the crystal structure of a semiconductor. Describe the zinc blende structure. **(10)**

OR

Give an overview about 'Brillouin zone'. State how the Bragg's diffraction condition gives rise to Brillouin zone boundaries.

SECTION-II

Q.4 Discuss the suitability of DNA for fabrication of nanodevices. **(10)**

OR

Describe the challenges associated with fabrication of solar cells. How can band gap engineering be useful for high efficiency solar cells?

Q.5 Discuss the 'Electronic nose'. **(10)**

OR

Derive and explain the Bloch theorem.

Q.6 Write a brief note on biosensors and their applications. **(10)**

OR

Write a brief note on pressure sensors.