C.U.SHAH UNIVERSITY
Summer Examination-2019

Subject Name: Advances in Solid State Electronic Devices

Subject Code : 5SC04ASS1   **Branch: M.Sc. (Physics)**

Semester : 4   **Date : 01/05/2019**   **Time : 02:30 To 05:30**   **Marks : 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed

SECTION – I

Q-1	**Attempt the following questions**	**(07)**
a)	Give full form of MODFET.	(01)
b)	What is the need of transistor biasing?	(01)
c)	Provide full form of JFET	(01)
d)	What is the need of band tailoring in BJT.	(02)
e)	Give two applications of Charge Coupled Devices.	(02)
Q-2	**Attempt all questions**	**(14)**
(a)	Explain current control in MODFET	(08)
(b)	Describe any one advanced MOS devices	(06)

OR

Q-2	**Attempt all questions**	**(14)**
(a)	Provide details of Charge control model for MODFET	(08)
(b)	Explain any two methods of BJT band tailoring in brief.	(06)
Q-3	**Attempt any Two questions**	**(14)**
(a)	Give I-V Characteristics of MESFET	(07)
(b)	Describe Si-based HBT.	(07)
(c)	Explain any one large signal analog application of MODFET.	(07)
(d)	Describe in brief : Channel Length Modulation and motivation behind Heterojunction FETs	(07)

SECTION - II

Q-4   **Attempt all questions**   **(07)**

(a) Mention the meaning of quantum efficiency, Spectral purity, and Temporal Response of LED   (03)

(b) Draw diagram of edge emitting LED   (04)

Q-5   **Attempt all questions**   **(14)**

(a) Explain Capacitance-Voltage characteristics of the MOS structure   (08)

(b) Describe important effects in long channel and short channel MOSFETs in brief.   (06)

OR

Q-5   **Attempt all questions**   **(14)**

(a) Explain PIN photodetector.   (08)

(b) Mention LED performance issues in brief.   (06)

Q-6   **Attempt all questions**   **(14)**

(a) Describe Surface emitting LED   (08)

(b) Explain characteristics of semiconductor laser   (06)

OR

Q-6   **Attempt all questions**   **(14)**

(a) Provide detailed explanation of any one advanced LED structures   (08)

(b) Describe Avalanche Photodetector   (06)