

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Advances in Solid state Electronic Devices

Subject Code: 5SC04ASS1

Branch: M.Sc. (Physics)

Semester: 4

Date: 08/05/2018

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator and 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 HBT's. (01)
 - b. Give the types of regions in I-V characteristics of JFET distributed. (01)
 - c. Define pinch-off voltage V_p and gives its formula for JFET. (02)
 - d. What is MODFET? (01)
 - e. Draw only schematic of MODFET device structure. (02)
- Q-2 Attempt all questions (14)**
- A Explain in details Saturation regime in current-Voltage characteristic of JFET. (09)
 - B Explain in details GaAs/AlGaAs HBT's in details. (05)
- OR
- Q-2 Attempt all questions (14)**
- A Explain in details InGaAs/InAlAs and InGaAs/ InP HBT's in details. (08)
 - B Write a short note on MODFET. (06)
- Q-3 Attempt all questions (14)**
- A Explain in details Ohmic regime in current-Voltage characteristic of JFET. (09)
 - B Explain Si- Based HBT's in details. (05)
- OR
- Q-3 Attempt all questions (14)**
- A Explain in details I-V characteristics of MODFET with different types of regions. (08)
 - B Why need for band tailoring and HBT's. (06)

SECTION – II

- Q-4 Attempt the Following questions. (07)**
- a. Which types of material used for light emitting devices. (01)
 - b. Give names of advanced LED structures. (01)
 - c. Define MOSFET and gives its types. (02)
 - d. Write basic operating principle of Photoconductors and give its types. (02)



- e. What is impact ionization? (01)
- Q-5 Attempt all questions (14)**
- A** Write a short note on Hetrojunction LEDs. (06)
- B** Explain in details depletion type MOSFET with proper circuit diagram. (08)
- OR**
- Q-5 Attempt all questions (14)**
- A** Explain in details MOS Capacitor and its accumulation, Depletion and Inversion regions. (08)
- B** Explain in details Surface emitting LEDs. (06)
- Q-6 Attempt all questions (14)**
- A** Explain in details current-Voltage characteristics of MOSFET and give its parameters. (08)
- B** Explain in details edge emitting LEDs. (06)
- OR**
- Q-6 Attempt all Questions (14)**
- A** Explain in details Complementary MOSFET. (05)
- B** Explain in details operating principle and characteristics of LASER Diode. (06)
- C** Explain in details Light- current characteristics of LED. (03)

