Q.P. Code : 5064

(3 Hours)

[Total Marks : 80]

N.B. 1)Question no.1 is compulsory and solve any three questions from remaining Questions
2) Assume suitable data if necessary
3) Draw neat and clean figures

Q-1 Solve any four
a Draw small signal model of pn junction diode, what is the main use of this model. 5
b What do you mean by different transistor models, explain Hybrid Pi model. 5
c What are the advantages of MESFET over MOSFET, explain basic principle of operation of MESFET 5
d What is the basic operating principle of phototransistor, draw V_I characteristics and explain its use in field of optoelectronics. 5
e How PUT is different than UJT, explain . 5

Q-2a Explain structure, construction and working of IMPATT diode. 10
b Explain working of BJT considering all possible current density components in an NPN transistor operating in Active mode. 10

Q-3a Derive equation of Electric field for a pn junction under zero bias and hence derive equation of maximum electric field. 10
b What is HBT , explain with the help of energy level diagram. 5
c Explain qualitative characteristics of Schottky diode. 5

Q-4a Explain JFET with the help of construction and V-I characteristics, how it is different than BJT 10
b What is the basic working principle of Solar cell, explain construction, working and V-I characteristics, also explain what is the need to connect solar cells in series or in parallel fashion. 10

Q-5a Derive equation of threshold voltage of a N channel MOSFET, also derive threshold voltage equation in generalized form. 10

b Explain construction working and V-I characteristics of SCR , also explain how SCR can be switched OFF. 10

Q-6a Explain working of MOSFET considering possible cases of VGS voltages. 10
b Explain construction, working and V-I characteristic of TRIAC. 5
c Explain channel length modulation in MOSFET. 5

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