3-2-110R

w.e.f. 2016-17

B.Sc. Electronics Syllabus under CBCS

(revised in April 2016)

Semester-2 **PAPER – 2**

Electronic Devices and Circuits

UNIT 1: (12Hrs)

PN JUNCTION DIODES:

P-N junction Diode, Depletion region, Barrier Potential, Working in Forward and Reverse bias condition – Junction capacitance ,Diode current equation– Effect of temperature on reverse saturation current – construction, working, V-I characteristics and simple applications of varactor diode, Zener diode and Tunnel diode.

UNIT –II:(12hrs)

BIPOLAR JUNCTION TRANSISTOR AND ITS BIASING: (D.C)

Introduction, Transistor Construction, Operation, and characteristics of CB, CE, and CC – Configurations. Complete hybrid equivalent model, Transistor as a switch

BJT Biasing: Fixed-Bias Circuit, Emitter-Stabilized Bias Circuit, Voltage-Divider Bias, Bias Stabilization.

UNIT-III:(16hrs)

FIELD EFFECT TRANSISTORS , UJT & SCR:

Introduction, Construction, Operation and Characteristics of FET/JFET, Drain and Transfer characteristics, Depletion-type, and Enhancement-Type MOSFETs.

FET Biasing: Fixed-Bias Configuration, Self-Bias Configuration, Voltage-Divider Biasing, UJT construction-working, V-I characteristics, UJT as a Relaxation oscillator.

Silicon Controlled Rectifier (SCR):

Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics, Application of SCR for power control.

UNIT IV: (08hrs)

PHOTO ELECTRIC DEVICES:

Light-Emitting Diodes (LEDs), IR Emitters, Photo diode, Photo transistors, Structure and operation of LDR, and Opto-Isolators.

UNIT-V:(12hrs)

POWER SUPPLIES:

Rectifiers::Half wave ,full wave and bridge rectifiers-Efficiency-ripple factor-Regulation, Types of filter-choke input(inductor) filter,shunt,L-section&π-section filters.Three terminal fixed voltage I.C.regulators(78XX and &79XX)-Principle and working of SMPS(switch mode power supplies)

TEXT BOOKS:

1. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
2. Electronic Devices and Circuits I – **T.L.Floyd- PHI Fifth Edition**

13/12/2016 Chairman BoS

13/12/16 Member, BoS

13/12/16 Member, BoS

13/12/16 Member BoS

REFERENCE BOOKS:

1. Integrated Electronics – **Millmam & Halkias.**
2. Electronic Devices & Circuits – **Bogart.**
3. Sedha R.S., A Text Book Of Applied Electronics, S.Chand & Company Ltd

NOTE: Question paper must be set such that part-A should contain 1 numerical problem and part-B should contain numerical problems attached in 2 questions with both (a) & (b) containing problems. Each problem should carry 5 Marks

13/12/2016

13/12/16

13/12/16

ELECTRONICS LAB-2

(ELECTRONIC DEVICES AND CIRCUITS LAB)

LAB LIST:

1. V-I Characteristics of junction diode
2. V-I Characteristics of zener diode
3. Regulated power supply using zener diode
4. BJT input and output characteristics
5. FET input and output characteristics
6. UJT characteristics
7. LDR characteristics
8. IC regulated power supply(IC-7805)
9. V-I characteristics of SCR.

Lab experiments are to be done on breadboard and simulation software (using Multisim/Microsim) and output values are to be compared and justified for variation.

13/12/2016
Chairman BoS

13/12/16
Member, BoS

13/12/16
Member, BoS

13/12/16
Member BoS

MODEL PAPER

B.Sc (Three year) Degree Examinations.

SEMISTER-II ELECTRONICS

Paper-II ELECTRONIC DEVICES AND CIRCUITS

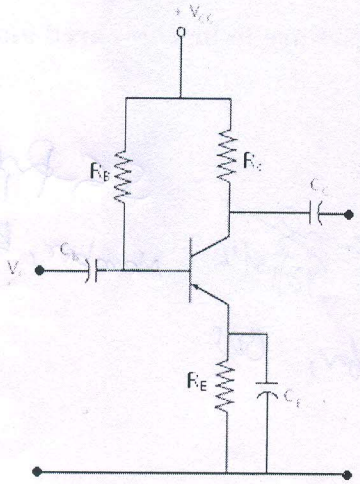
Time: 3 Hrs

MaxMarks:75

PART-A

Answer any FIVE Questions 5x5 = 25 Marks.

1. Explain Zener and Avalanche break down.
2. Explain Junction capacitance of a P-N Junction diode.
3. Define Hybrid parameters of a Transistor.
4. Find the operating point for the bias circuit shown in the fig. provided Vcc = 9V , R_B = 50KΩ, R_c = 250Ω, R_E =500Ω and α= 80.



5. What are the advantages of FET over BJT.
6. Write the operation of photo voltaic cell.
7. Draw the circuit diagram of π - section filter and discuss its working.
8. Discuss the working of Transistor series Voltage regulator.

PART-B

Answer ALL Questions 10X5 =50marks.

9(a) . Explain forward and reverse bias effects in the V-I Curves of a P-N Junction diode?. A silicon diode has a reverse saturation current of 0.1n A at 20^0 C. Find the current through it when forward biased by 0.6V?

(or)

(b) . Describe the construction and working of a Tunnel diode. Draw its V-I Characteristics and explain?

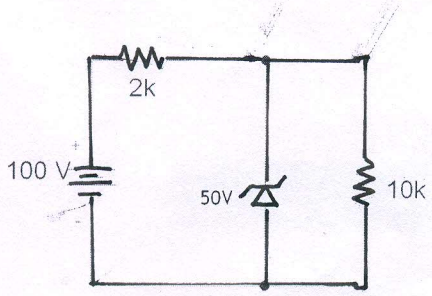
13/12/2016 Chairman BOS

13/12/16 Member, BOS

S. GRA 13/12/16 Member, BOS

13/12/16 member BOS

Calculat the voltage drop across 2K ohm resistance and current through Zener diode for the circuit given?



10(a).Draw the input and Output Characteristics of a CE mode of a Transistor . Define Cut-off , Active and saturation region in the characteristics.

(or)

(b).Describe about fixed bias and voltage divider bias of a Transistor . Give their merits and demerits.

11(a).Explain the Construction , working of JFET.

(or)

(b). What is a UJT ? Describe the Volt-Ampere Characteristics of a UJT.

12(a). Explain operation of photoconductive cell and discuss its spectral response.

(or)

(b).Explain Construction and working of LED and write its merits and uses.

13(a).Explain working of full wave rectifier with junction diodes?

A full wave rectifier uses a centre tapped Transformer . The a.c. Voltage from its centre tap to either end is 10 Sin 314t. The load resistance of the circuit is 40Ω and Diode resistance 10Ω . Find I_{dc},I_{rms}, and rectifier efficiency.

(or)

(b).Explain the working of SMPS with the help of block diagram.

The DC output voltage of a power supply unit is 41V for no load and 40V for full load . Calculate the % regulation?

13/12/2016 Chairman BOS

13/12/16 Member, BOS

13/12/16 Member BOS

13/12/16 member BOS