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S.V.UNIVERSITY, TIRUPATI
B.Sc- ELECTRONICS-SYLLABUS
SEMESTER: II – W.E.F. 2015-16

PAPER 2 –ELECTRONIC DEVICES&CIRCUITS

(60hrs)

UNIT I(12hrs)

JUNCTION DIODES

PN junction diode – P-N junction theory-depletion region, barrier potential, working in forward& reverse bias condition, Junction capacitance, Diode current equation (no derivation), Effect of temperature on reverse saturation current, V-I Characteristics , Zener and Avalanche Break down, Zener diode - V-I characteristics regulated power supply using Zener diode, Varactor Diode, Tunnel Diode – Principle, Working& Applications.

UNIT II(16hrs)

BIPOLAR JUNCTION TRANSISTORS (BJT)

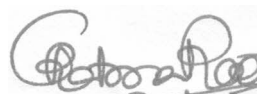
PNP and NPN transistors, current components in BJT, BJT static characteristics (Input and Output), Early effect, CB,CE,CC Configurations (Cut-off, Active and saturation regions), h-parameters, h-parameter equivalent circuit. Determination of h-parameters from the characteristics, Concept of amplification-voltage and current amplifier. Biasing and load line analysis, Fixed bias, voltage divider bias arrangements, The C.E amplifier-analysis and parameters, Transistor as a switch.

UNIT III(12hrs)

FIELD EFFECT TRANSISTORS&UJT

FET - Construction - Working – Drain&Transfer characteristics –Parameters of FET – FET as an amplifier-MOSFET-Enhancement MOSFET –Depletion MOSFET –Construction& Working- Drain characteristics of MOSFET –Comparison of FET&BJT and JFET&MOSFET.

UJT Construction-working, V-I Characterstics


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UNIT IV (8hrs)

PHOTO ELECTRIC DEVICES

Structure and operation, characteristics, spectral response and applications of LDR, Photo Voltaic cell, Photo diode, Photo transistor, LED and LCD

UNIT V (12hrs)

POWER SUPPLIES

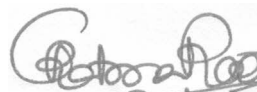
Rectifiers – Half wave, full wave and bridge rectifiers – Efficiency – Ripple factor – Regulation
Types of filter- Choke input (Inductor) filter – shunt capacitor filter –L-Section and π section filters — Voltage regulators- Transistor Series and shunt regulators – Block diagram of regulated power supply, Three terminal fixed voltage I.C regulators (78XX and 79XX) - Principle and working of switch mode power supplies (SMPS).

TEXT BOOKS

1. Electronic Devices and Circuits David A. Bell, Fifth edition, Oxford university press
2. A.P Malvino, "Principles of Electronics", TMH, 7th edition
3. D.Roy Choudary, Linear Integrated Circuits, New Age International Pvt. Ltd.
4. T.F. Bogart, Beasley, "Electronic Devices and circuits", Pearson Education, 6th Edition
5. N.N. Bhargava, D.C Kulshreshta, and S.C Gupta, "Basic Electronics and Linear Circuits" TMH,
6. T.L. Floyd, "Electronic Devices and circuits", PHI, fifth edition
7. V.K. Mehta, "Principle of Electronics", S CHAND Co. New edition
8. Godse A.P., Bakshi U.A (1st edition), Electronics Devices, Technical Publications Pune.

REFERENCE BOOKS

1. Sedha R.S., A TextBook of Applied Electronics, S. Chand & Company Ltd.
2. Jacob Millman and Christos C. Halkias (2008) Integrated Electronics, Tata Mcgraw-Hill
3. Robert L. Boylestad, Louis Nashelsky (10th edition), Electron Devices and Circuit Theory, Dorling Kindersley (India Pvt. Ltd.)


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ELECTRONICS LAB – 2

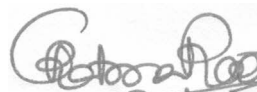
(ELECTRONIC DEVICES&CIRCUITS LAB)

(Any six experiments should be done)

1. V-I Characteristics of Junction Diode.
2. V-I Characteristics of Zener Diode.
3. Regulated Power Supply using Zener Diode.
4. IC Regulated Power Supply
5. BJT input and output Characteristics (CE Configuration) and determination of h- parameters.
6. Characteristics of UJT.
7. Characteristics of JFET
8. LDR characterstics
- 9.Characterstics of L and Π section filters with fullwave rectifier

LAB MANUAL

1. Zbar, Malvino and Miller, Basic Electronics, A Text Lab Manual, Tata McGraw Hill.
2. Sugaraj Samuel R., Horsley Solomon, B.E.S. Practicals.


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MODEL PAPER

B.Sc (Three year) Degree Examinations.

SEMISTER-II ELECTRONICS

Paper-II ELECTRONIC DEVICES AND CIRCUITS

Time: 3 Hrs

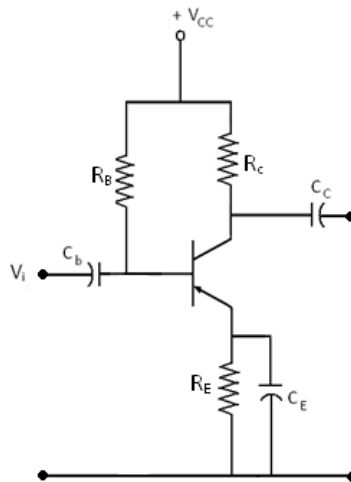
MaxMarks:75

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 $V_{CC} = 9V$, $R_B = 50K\Omega$, $R_C = 250\Omega$, $R_E = 500\Omega$ and $\alpha = 80$.



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.

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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.

(or)

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

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.

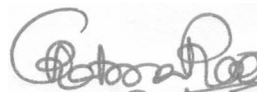
(or)

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

13(a).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} , ripple factor and rectifier efficiency.

(or)

(b).Explain the Principle and working of switch mode power supply (SMPS) with the help of block diagram.

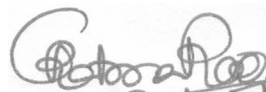

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B.Sc- ELECTRONICS PRACTICALS

SCHEME OF VALUATION FOR ALL SEMESTERS

- 1.Principle/Statement -----2marks
- 2.Circuit diagram with component labelling-----5marks
- 3.Tabularform/Formula/Modelgraph-----6marks(3+2+1)
- 4.Observations-----12marks
- 5.Calculations/Graph/Result-----10marks(5+3+2)
- 6.Viva-----5marks
- 7.Record-----10marks

TOTAL= 50marks


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