Lecture Plan for Basic Electronics (EC-101)

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Section : EC-3
Web Page : http://sbajpai.yolasite.com/basic-electronics.php

Lecture	Topic	Reference Book
1.	Introduction to Electronics. Group-IV materials, Covalent bond & electron-hole concepts	1
2.	Introduction to Conductor, Semiconductor, Insulator and Conductivity & Mobility	1,2
3.	Numerical problems on Conductivity & Mobility	2
4.	Concept of Forbidden gap, Intrinsic and extrinsic semiconductors, Donors and Acceptors impurities	1
5.	Mass Action Law with its mathematical expression, Fermi Level and Numerical problems	2
6.	Diffusion, Recombination & Hall Effect	2
7.	Introduction to PN Junction, depletion layer, V-I characteristics & diode current equation	1,2
8.	Breakdown and Avalanche mechanism & Zener diode	1
9.	Zener diode as regulator and Numerical problem related to the Zener diode.	1
10.	Introduction to Rectifier and its different parameters. Half wave rectifier & Full wave rectifier and its parameter calculation	1
11.	Half wave rectifier & Full wave rectifier and its parameter calculation with numerical problems	1
12.	Introduction to clippers and its uses.	1
13.	Clamper, Voltage doubler & Capacitive filter	1
14.	Diode resistance, capacitance & numerical problems asked in ESE exams	1
15.	Introduction to Transistor, its types, basic construction, transistor action its different configurations & its operation	1,4
16.	CB, CE and CC configurations, input/output characteristics- 1	1,4
17.	CB, CE and CC configurations, input/output characteristics - 2	1,4
18.	Biasing of transistors-fixed bias, emitter bias, potential divider bias, comparison of biasing circuits	1,4
19.	Analysis of CE amplifier, concept of voltage gain & current gain. Calculation of input and output resistance	1,4
20.	Stability factor & h parameter model (low frequency) of transistor	1,4

21.	Numerical problems on Transistor	1
22.	Numerical problems on Transistor & numerical problems asked in ESE exams	1
23.	Introduction to JFET: Basic construction, transistor action & concept of pinch off.	1
24.	Maximum drain saturation current, input and transfer characteristics	1
25.	Characteristic equation CG, CS and CD configurations, fixed-, self-biasing	1
26.	Numerical problems on JFET Biasing	1
27.	MOSFET: depletion and enhancement type	1
28.	MOSFET-construction, operation and characteristics.	1
29.	Computation of A_v, R_i, R_o, of single FET amplifiers using all the three configurations	1
30.	Numerical problems on JFET and MOSFET & numerical problems asked in ESE exams.	1
31.	Introduction to Number systems & conversion of bases.	3
32.	Boolean algebra, logic gates, concept of universal gate, canonical forms.	3
33.	Logic gate conversion & numerical problems.	3
34.	Introduction to K-map and d'nt care condition.	3
35.	Minimization using K-map.	3
36.	Numerical Problems on Unit IV.	3
37.	Numerical problems asked in ESE exams.	3
38.	Introduction to ideal operational amplifiers.	1
39.	Different ideal op-amp parameters.	1
40.	Inverting, non-inverting and unity gain amplifiers.	1
41.	Adders, difference amplifiers, integrators of Op-amp.	1
42.	Voltage follower & differential amplifier.	1
43.	Digital Multimeter & CRO	1
44.	Measurement of voltage, phase & frequency.	1
45.	Double beam CRO and numerical problems	1
46.	Numerical problems asked in ESE exams.	1

1. Boylestad and Nashelsky, 'Electronic Devices and circuits' PHI, 8th Edition, 2001.
2. Jacob Millman & Christos Halkias, 'INTEGRATED ELECTRONICS',Second Edition, 1984
3. M. Morris Mano, 'Digital Design', 4th Edition
4. Sedra & Simth, Microelectronics Circuits

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