University Institute of Engineering & Technology
(A Constituent Autonomous Institute)
Kurukshetra University, Kurukshetra ROLL NO.-
THEORY EXAMINATION – DECEMBER 2015
B. Tech (Electronics & Communication Engg) 3rd Semester

COURSE NO.: ECE-203 COURSE TITLE: Electronic Devices

M.M. 75 TIME 3 HRS

PART-A (TIME 30 MINUTES)

1. Answer the following multiple choice questions 15

1	According to the energy level diagram of semiconductor, the width of forbidden band gap is about	
	(a) 10eV	(b) 100eV
	(c) 1eV	(d) 0.1eV
2	The Hall coefficient of a sample of silicon having 10^{22} arsenic atoms per meter cube is	
	(a) 0.00349 m^3 /C	(b) 0.000625 m^3/C
	(c) 0.0013 m^3/C	(d) 0.0056 m^3/C
3	The diffusion current is proportional to	
	(a).Applied electric field	(b) Concentration gradient of charge carrier
	(c) square of the applied electric field	(d) mobility
4	A transistor operates in saturation region when	
	(a) E-B junction F. B& C-B junction R. B	(b) E-B junction F. B& C-B junction F. B
	(c) E-B junction R. B& C-B junction F. B	(d) E-B junction R. B& C-B junction R. B
5	For α=0.9, the value of β is	
	(a) 1	(b) 0.9
	(c) 9	(d) 10
6	Zener diode acts as the	
	(a) Voltage regulator	(b) Clipper
	(c) Clamper	(d) Rectifier
7	Voltage regulation in ideal case should be	
	(a) zero	(b) 1
	(c) infinite	(d) 0.5
8	Filter is a device used to	
	(a) increase the ripples	(b) decrease the ripples
	(c) has no effect on ripples	(d) to increase the output voltage
9	Channel length modulation of FET's means	
	(a) Decrease in channel width	(b) increase in channel width
	(c) no effect on channel	(d) increase in drain current
10	Fermi level in n type semiconductor is	
	(a) closer to conduction band	(b) closer to valence band
	(c) between valence and conduction band	(d) does not exists
11	Two terminal MOS behaves like the	
	(a) inductor	(b)parallel plate capacitor
	(c) Resistor	(d) constant current device
12	Schottky diode is	
	(a) p-n junction diode	(b) metal metal junction diode
	(c) metal semiconductor diode	(d) none
13	In shunt voltage regulators	
	(a) controlling element is in shunt with the load	(b) comparator in shunt
	(c) reference voltage is in shunt	(d) sampling circuit is in shunt
14	IC-7910 will provide voltage about	
	(a) +5 V	(b)+10 V
	(c) -10V	(d) 79V
15	As the magnitude of collector junction reverse bias increases, the effective base width	
	(a) increases	(b) decreases
	(c) remains unaltered	(d) first increases than becomes constant

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PART B &C (TIME 2H 30 MIN)

PART-B

SECTION-I : All compulsory 2 question from each Unit		20
	UNIT-I	
2	Derive the relationship between resistivity and mobility in conductors.	2.5
3	Differentiate between depletion and diffusion capacitance in p-n junction diode.	2.5
	UNIT-II	
4	Explain the concept of base width modulation in BJT's.	2.5
5	What is meant by transconductance in FET's? Derive the relation between transconductance and amplification factor.	2.5
	UNIT-III	
6	What are the high frequency limitations of field effect transistors? Explain.	2.5
7	Write a short note on SMPS.	2.5
	UNIT-IV	
8	What are H parameters of transistors? What are its applications?	2.5
9	What is the need of voltage regulators in linear power supply ?Also draw the pin diagram of IC voltage regulator.	2.5

PART-C

SECTION-II : Attempt Four Questions in all Selecting at least One question from each Unit		
	UNIT-I	
10	Explain the construction, characteristics and applications of tunnel diode.	10
11	A specimen of silicon 0.2 mm long and has a cross section of 0.2*0.2mm. One volt impressed across the bar results in a current of 8mA. Assuming that current is due to electrons, calculate the concentration of free electrons and drift velocity. Given that mobility of electrons is 1300 cm square per volt second.	10
	UNIT-II	
12	Explain the working of transistor series and controlled transistor voltage Regulators with the help of neat and clean circuit diagrams.	10
13	Draw the complete power supply to provide the output voltage of +12V using Centre tapped full wave rectifier and CLC filter with load resistance of 500 Ohms.	10
	UNIT-III	
14	With the help of characteristics of JFET explain the DC current voltage Relationship of JFET.	10
15	Explain the working of two terminal MOS structure and also draw the Energy band diagrams when gate is negative.	10
	UNIT-IV	
16	Draw the hybrid equivalent model and analyse the input and output Impedance in common emitter transistor amplifier.	10
17	Explain the working of transistor in saturation region and also explain Ebers Moll model in detail.	10