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SARDAR PATEL UNIVERSITRY

M.Sc Electronics and Communication (Sem-I)

Subject :- Analog Interface Electronics

Subject Code: - PS01CELC02

Date & Day :- 22/4/2015, Wednesday

Time :- 10:30AM TO 01:30PM

Total Marks – 70

Note : The figure to the right indicates full marks
All questions are compulsory

Q-1 Choose the correct answers **(08)**

1. Mark the correct statement/statements

(a) the temperature coefficient of an intrinsic semiconductor is negative
(b) for N-type semiconductor doping material is pentavalent
(c) an N-type semiconductor as a whole electrically neutral
(d) when an extrinsic semiconductor is doped with P-type impurity, each impurity atom will acquire negative charge

2. In JFET the gate controls_____

(a) The width of the channel (b) The drain current
(c) The gate control (d) All of above

3. Virtual ground in an OP-AMP is due to_____

(a) high gain (b) terminal is directly connect to ground
(c) high input impedance (d) Both (a) & (c)

4. A Field effect Transistor_____

(a) Has 3 *pn* junctions
(b) incorporates a forward biased junction
(c) depends upon the variation of a magnetic field of a operation
(d) depends upon the variation of the depletion layer width with reverse voltage

5. In the feedback resistor in an inverting mode of OP-AMP is replaced by a capacitor, the circuit will work as

(a) Integrator (b) Differentiator
(c) Summer (d) Shcmitt trigger

6. One of the application of the current mirror is_____

(a) output current limiting (b) current feedback
(c) obtaining very high current gain (d) temperature stabilized biasing

7. OP-AMP can be used

(a) only in linear range (b) only in its saturation mode
(c) Both (a) & (b) (d) in saturation mode for high freq.

8. Current flow in a semiconductor depends on the phenomenon of_____

(a) drift (b) diffusion
(c) recombination (d) All of above

Q-2 Attempt any Seven of the following **(14)**

1. Differentiate between diffusion current & drift current.

2. Define : Hall effect.

P.T.

3. Why do we use window comparator?
4. What is zener effect?
5. List out the D.C parameters of OP-AMP and explain any two
6. Draw the circuit diagram of the Non Inverting amplifier and explain it.
7. Why current mirror circuit is required?
8. Write down the comparison of active filter over passive filter.
9. Draw the energy band diagram of Semiconductor material.

Q-3	(a)	Using the necessary concepts, derive the equation for hall coefficient obtained from	(6)
	(b)	Draw the circuit diagram of comparator .Describe the comparison of voltage in Inverting as well as Non Inverting comparator with necessary waveform.	(6)
		OR	
	(b)	Explain the AC & DC analysis of the Differential amplifier.	(6)
Q-4	(a)	Write a note on following : (Any two) a. Varactor diode b. Tunnel diode	(6)
	(b)	What is the difference between Intrinsic & Extrinsic Semiconductor? Explain the Extrinsic semiconductor material with appropriate crystal structure.	(6)
		OR	
	(b)	Explain the second order High pass filter with necessary circuit diagram.	(6)
Q-5	(a)	Draw the circuit diagram of Instrumentation amplifier and describe its working in detail.	(6)
	(b)	Explain the construction and working of PN junction diode, also explain one of its application.	(6)
		OR	
	(b)	Draw the circuit diagram of integrator. Describe the process of integration carried out in circuit.	(6)
Q-6	(a)	List out the AC & DC parameter of OP-AMP, explain it.	(6)
	(b)	Explain the First order Low pass filter with necessary circuit diagram.	(6)
		OR	
	(b)	With appropriate circuit diagrams, explain the enhancement mode & depletion enhancement mode MOSFET.	(6)

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