Code No. : 13605 S

# VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (IT: CBCS) III-Semester Supplementary Examinations, May/June-2018

## **Basic Electronics**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

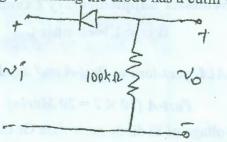
### Part-A $(10 \times 2 = 20 \text{ Marks})$

- 1. Justify why the cut-in voltage of Si diode more than Ge diode?
- 2. Compare the different performance parameters of a HWR, FWR and Bridge rectifier.
- 3. Define the term thermal run away in Bipolar junction transistor?
- 4. Explain how a transistor acts as an amplifier.
- 5. Define the terms (i) Noise margin (ii) Propagation delay.
- 6. List the various Digital IC technologies.
- 7. Why RC oscillators are not used at high frequencies?
- 8. Show that gain reduces with negative feedback.
- 9. List the ideal characteristics of Op-Amp.
- 10. Draw the logarithmic amplifier circuit using Op-Amp.

#### Part-B $(5 \times 10 = 50 \text{ Marks})$

11. a)	Explain the operation of Half wave Rectifier and derive the expressions of Efficiency, Ripple factor and percentage regulation.	[6]
b)	A sinusoidal voltage of amplitude 20V, 50Hz is applied to a half wave rectifier. If $RL = 1000\Omega$ , $Rf = 10\Omega$ , $Rr = \infty$ , Find the values of <i>i</i> ) Conversion Efficiency <i>ii</i> ) Ripple factor <i>iii</i> ) Percent Regulation	[4]
12. a)	Draw the exact h parameter model of a Transistor suitable for any configuration. Derive expressions for voltage gain, input impedance of an amplifier using exact h parameter model.	[6]
b)	Explain the necessity of biasing a Transistor. Derive the Q-point of a self-bias (Potential Divider) circuit in Common Emitter Configuration.	[4]
13. a)	Explain the physical structure of MOSFET.	[5]
b)	Implement NOR gate using CMOS circuit and verify its operation using a Truth table indicating the transistor conditions.	[5]
14. a)	Briefly explain the different topologies of Negative feedback amplifiers with neat block diagrams and explain the effect of feedback on input and output impedances for each case.	[5]
b)	) What is an oscillator? What is the necessary condition for the oscillator to produce oscillations? List out the different types of Oscillators.	[5]
15. a)	) Explain operation of Astable multivibrator using Operational Amplifier.	[5]
	) Draw the circuit diagram for op-amp as integrator and derive an expression for its output.	[5]
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16. a) Determine the output for the circuit shown below where the input is a sinusoidal signal [5] with 40V peak-to-peak votage, assuming the diode has a cutin voltage of 0.7V.



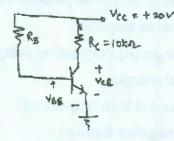
b) Draw the DC load line and determine the operating point for the BJT circuit shown below. Assume V<sub>BE</sub>=0.7V.

[5]

[5]

[5]

[5]



- 17. Answer any two of the following:
  - a) MOSFET as an amplifier
  - b) Effect of negative feedback on Band width and sensitivity
  - c) Generation of triangular waveform using op-amp

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  - 3. a) Frontain the physical structure of MOSPE
  - a) Implementat 20.08 gate raing CMOS circuit and verify its operation asing a Fronti start indicating the transition conditions.
- 14. a) Briefly coplain the different topologies of Neutron roldsact amplitude of the difference disgrams and explain the offert of teachings to inple and earpy inspectation of with case.
- b) What is an ascalizator? What is one processory configured for two resultance to prosterior configurations? East one the different types of the lines.
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