

Code No. : 13606

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (I.T.: CBCS) III-Semester Main Examinations, December-2017

Basic Electronics

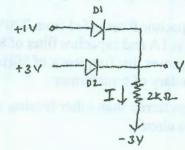
Time: 3 hours

Max. Marks: 70

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

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

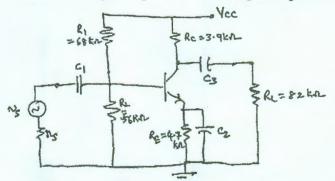
- 1. Define the concept of depletion region in a pn junction diode.
- 2. For the circuit shown below, assuming ideal diode, determine current I, and Voltage V.



- 3. Compare BJT and FET.
- 4. Explain the need for biasing a transistor.
- 5. List the important characteristics of FET.
- 6. Implement NOT gate using CMOS circuit.
- 7. Define Barkhausen Criterion for oscillations.
- 8. Write the expression for frequency of Oscillation of a tuned LC Oscillator.
- 9. Define the terms (i) Slew rate (ii) CMRR
- 10. Draw the circuit diagram for op-amp as differentiator.

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

- 11. a) Explain how Zener diode acts as a regulator.
 - b) Derive the expressions for PIV, Ripple factor and Conversion Efficiency of a Full wave [6] rectifier.
- 12. a) A common Emitter circuit shown below, has the following h- parameters: h_{ie}=2.1KΩ, [6] h_{fe}=75 and h_{oe}=1µS. Determine input impedance and output impedance.



b) Explain how transistor is used as a switch.

[4]

[4]

| 13. a) Briefly explain the operation of CMOS inverter. | [5] |
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| b) Compare the various digital integrated circuit logic families. | [5] |
| 14. a) Draw the different topologies in a negative feedback amplifier. Explain the effect of feedback on the input and output impedances in each case. | [5] |
| b) Draw the circuit diagram of Colpitts oscillator. Derive the expression for its frequency of Oscillation. | [5] |
| 15. a) Explain the operation of op-amp as current controlled voltage source. | [5] |
| b) Briefly explain the operation of op-amp as instrumentation amplifier. | [5] |
| 16. a) A bridge rectifier with capacitor filter is fed from 220V to 40V step-down transformer. If average dc current is load is 1A and capacitor filter of 800μF, calculate the load regulation and ripple factor, assume power line frequency of 50Hz. Neglect diode forward resistance and dc resistance of secondary of transformer. | [5] |
| b) Why self bias circuit is preferred than other biasing circuits? Derive the expression for stability factor of self bias circuit. | [5] |
| 17. Answer any <i>two</i> of the following: | |
| a) CMOS-NAND implementation | [5] |
| b) Draw the RC-phase shift oscillators and derive its frequency of oscillation. | [5] |
| c) Op-amp as a Analog multipliers | [5] |
| CSCSCSSD BD | |
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| 10 as a common Emitter circuit shown below, has the millowers he parameters in d. 0.12. | |



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