Hall Ticket Number:

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 × 2 = 20 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 × 10 = 50 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 = 1000Ω, Rf = 10Ω , Rr = ∞, Find the values of [4]
    i) Conversion Efficiency *ii)* Ripple factor *iii)* Percent Regulation

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]

    b) Draw the circuit diagram for op-amp as integrator and derive an expression for its output. [5]

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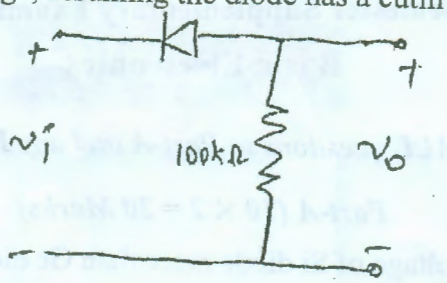
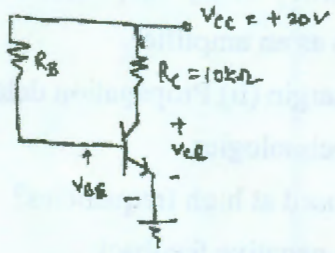
16. a) Determine the output for the circuit shown below where the input is a sinusoidal signal with 40V peak-to-peak votage, assuming the diode has a cutin voltage of 0.7V. [5]



b) Draw the DC load line and determine the operating point for the BJT circuit shown below. Assume V_{BE}=0.7V. [5]



17. Answer any *two* of the following:

a) MOSFET as an amplifier [5]

b) Effect of negative feedback on Band width and sensitivity [5]

c) Generation of triangular waveform using op-amp [5]