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**Code No. : 13605 O3**

# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (IT) II Year I-Semester Old Examinations, May/June-2018

## Micro 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. Briefly discuss about Semiconductors.
2. Draw the circuit symbols of a Schottky Diode and Varactor Diode.
3. Sketch a simplified structure of an npn transistor.
4. Define the term propagation delay in CMOS circuits.
5. Distinguish between Class A, B and C Power Amplifiers.
6. Define the term Noise Margin.
7. Write the expression for frequency of oscillation in a tuned LC Oscillator.
8. List the ideal characteristics of an Operational Amplifier.
9. State four application circuits of Operational Amplifiers.
10. Draw the circuit of Voltage controlled Current source using an Op Amp.

### *Part-B (5 × 10 = 50 Marks)*

11. a) Draw i-v characteristic of a silicon junction diode to reveal relevant details in forward-bias, reverse-bias and breakdown regions. Interpret the equations: $v = n V_T \ln(i/I_S)$ and $V_T = kT/q$. [6]

    b) A silicon junction diode with $n = 1$ has $v = 0.7$ V at $i = 1$ mA. Find the voltage drop at $i = 0.1$ mA and $i = 10$ mA. [4]

12. a) Explain how a BJT acts as an Amplifier. [6]

    b) Given for a BJT $\beta = 50$ and $I_B = 10\mu A$, compute its collector current, also compute the value of $\alpha$. [4]

13. a) Sketch the physical structure of MOSFET and plot its $i_D$-$v_{DS}$ characteristics. [5]

    b) Implement an Ex-OR gate using CMOS transistors. [5]

14. a) Draw the general structure of a feedback amplifier as a signal-flow diagram and explain the concept of 'Loop Gain'. [5]

    b) Explain the operation of the Hartley Oscillator circuit and give an expression for its frequency of Oscillation. [5]

15. a) State and explain the characteristics of an ideal Operational Amplifier. [4]

    b) Explain the instrumentation Amplifier circuit using an Operation Amplifier. [6]

*Contd... 2*

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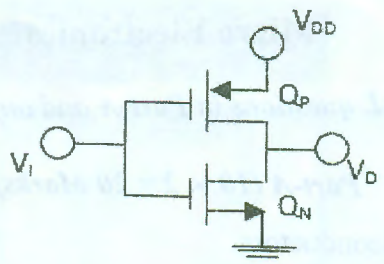
16. a) Explain the input and output characteristics of a BJT in common Emitter configuration. [6]

    b) Explain the operation of the circuit given below. [4]




17. Write short notes on any ***two*** of the following:

    a) BJT and MOSFET Amplifiers. [5]

    b) Small Signal Model for Transistor Amplifier. [5]

    c) Integrator and Differentiator using Op-Amp. [5]