Hall Ticket Number:

# VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (IT) II Year I-Semester Old Examinations, May/June-2018

Time: 3 hours

## **Micro Electronics**

Max. Marks: 70

Code No. : 13605 O3

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

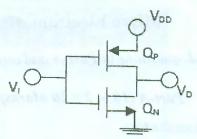
#### Part-A $(10 \times 2 = 20 \text{ Marks})$

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

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 <sub>B</sub> =10µA, compute its collector current, also compute the value of $\alpha$ .	[4]
13.	a) Sketch the physical structure of MOSFET and plot its ip-vps 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]

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.
  - b) Small Signal Model for Transistor Amplifier.
  - c) Integrator and Differentiator using Op-Amp.

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- a) A minimum timetion divide with n = 1 has v = 0.7 V at [= 1 mA. Find the value of impair i = 0.1 mA and i = 10 mJC.
  - 12. a) Explain how a BJT adda as an Amphilian
- by fairers for a hill () 50 and for flip.4 company its solitering opposite size company the value of x
  - activity of a pin sport duration of MOSEPT and plot its no-very durations.
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- a) Draw the ground surveyors of a feedback and "four as a most thow diagram and explain the convert of "Loop Geit".
- in true do the equilitation of the Rentary Doublisher disjuit and give an expression for an requercy of Oscillation
  - a) State and explain the characteristic deviation of an ateal Operational Amplification.
  - Explain the Intronectation Netplitics count string on Operation Applifics.

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