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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec. - 2014

Electronic Circuits

Time: 3 hrs *Max. Marks: 100*

Note: *i) Answer **FIVE** full questions, selecting **ONE** full question from each Unit.*
ii) Assume suitable missing data if any.

Unit - I

1. a. Explain the working of positive clipper and negative clipper. 10

   b. Explain step recovery diodes and tunnel diodes. 10

2 a. Calculate the value of R_L and C for a stiff Clamper if the frequency of input signal is 1kHz. 5

   b. A clamper circuit uses R_L = 100 kΩ and C =10 μF. Calculate the range of frequencies over which perfect clamping takes place. 5

   c. Explain: 10

   i) Varactor diodes ii) Laser diodes.

Unit - II

3 a. Draw the dc and ac equivalent circuit of a VDB amplifier using i) π model ii) T Model. 10

   b. Derive an expression for re' (ac emitter resistance) 10

4 a. For the VDB amplifier, draw the ac (Simplified equivalent circuit if β=150, R_1 = 2.2 kΩ, R_2 = 560 Ω, R_C = 1.5 kΩ, R_E = 470 Ω, R_L = 10 kΩ, V_{CC} = 12 V 10

   b. Explain Large signal operation and how distortion is reduced using small signal operation. 10

Unit - III

5 a. Explain swamped amplifier. Mention its advantages. 10

   b. For a TSEB amplifier R_B = 10 kΩ, R_C = 3.3 kΩ, R_E = 8.2 kΩ, R_L = 3.3 kΩ, β = 100, V_{CC} = 10 V, $-V_{EE}$ = -10 V, V_{in} = 5 mV. Calculate the voltage gain and output voltage across the load resistor 10

6 a. What is meant by Darlington pair? Mention its features and applications. 6

   b. Explain complementary Darlington pair. 4

   c. Derive the expression for $Z_{out} = RE \| \left[re^1 + \left(R_G \| R_1 \| R_2 \right) / \beta \right]$ where Z_{out} is output impedance of emitter follower. 10

Unit - IV

7 a. Explain the construction and working of n-channel D-MOSFET. 10

   b. Write short notes on MOSFET handling. 5

   c. Explain Dual gate D-MOSFET. 5

Contd….2

8 a. Draw and explain the working of E-MOSFET along with its drain characteristics and trans conductance curve. 10

b. Explain CMOS. 5

c. The E-MOSFET in the following circuit has $V_{GS(on)} = 2.5$ V, $I_{D(on)} = 100$ mA, $R_{DS(on)} = 10\Omega$.Calculate the voltage across the MOSFET if $V_{GS} = 2.5$ V. 5

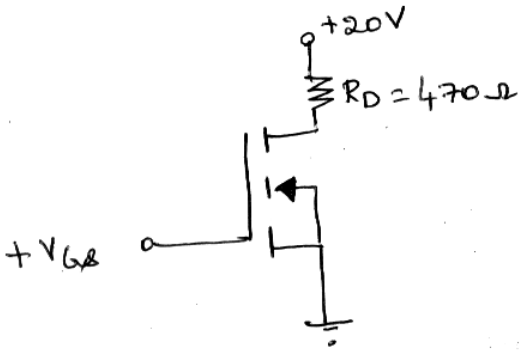

Fig Q.8c)

Unit - V

9 a. Explain briefly the different types of feedback amplifier. 12

b. What is meant by slew rate? For a VCVS amplifier determine close loop bandwidth and maximum undistorted peak value of output voltage if $f_{UGB} = 1$ MHz, $A_{v(u)} = 100$, $S_R = 0.5$ V/μs 8

10 a. Explain the working of an inverting Schmitt trigger and non inverting Schmitt trigger with neat circuit diagrams. 10

b. Explain Integrator circuit. 5

c. If the comparator has an open loop voltage gain of 106 dB. Calculate input voltage that results in positive saturation of output if supply voltages are ± 15V. 5

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