Reg. No. : ....

Name : ....

Third Semester B.Tech. Degree Examination, September 2014
(2008 Scheme)
(Special Supplementary)
08.305 : ELECTRONIC CIRCUITS – I (TA)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Derive the expression for cut-off frequency of a low pass filter.

2. State and explain clamping circuit theorem.

3. Derive expression for rectification efficiency of a bridge rectifier.

4. Explain how you provide short circuit protection in a series voltage regulator.

5. Define various stability factors.

6. Draw the small signal model for a MOSFET at low and high frequencies.

7. Explain the voltage divider bias for enhancement MOSFETs.

8. A transistor in CB configuration offers more bandwidth than the same transistor in CE configuration. Explain.

9. Compare conversion efficiency and distortion of class A, AB, B and C amplifier circuits.

10. State and prove Miller theorem.

(10×4=40 Marks)

PART – B

Answer **two** questions from **each** Module. **All** questions carry **equal** marks.

MODULE – I

11. A square of $\pm 5V$ amplitude and period T is applied to a low pass RC circuit with time constant = 10 T. Plot the output waveform to scale.

12. a) Derive expression for ripple factor in an LC filter connected to a full wave rectifier.

    b) A single L - section filter is used to reduce the ripple of a full wave rectifier to 1%. Find the value of L, if the capacitance used is 16 μF.

13. The input to the two level clipper shown varies linearly from 0 to 150 V. Sketch the output voltage to scale. Assume ideal diodes.
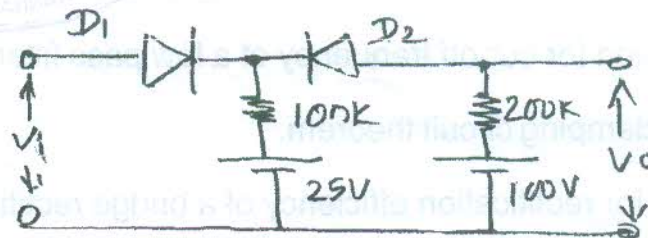
MODULE – II

14. Calculate the voltage gain of the amplifier for a device parameter $I_{DSS} = 10$ mA and $V_P = -4.5$ V. Assume $r_d = \infty$. Derive the relevant expression.
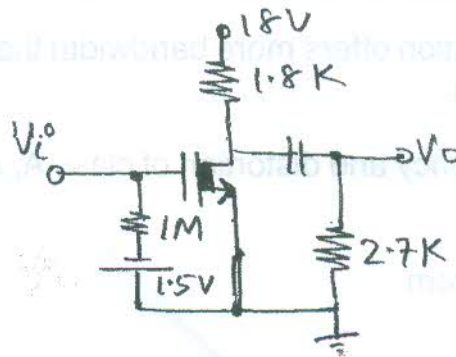
15. Prove that for an emitter follower circuit the gain is approximately one and the input impedance is $R_B \parallel \beta R_E$.

16. Design an RC coupled amplifier for the following specifications : $A_v = -150$, V_{CE} (Q) = 7 V, IC (Q) = 2 mA, S = 4 ; current gain of the transistor is 100 and supply voltage is 15 V.

MODULE – III

17. a) Write a note on biasing methods of class AB power amplifier.

   b) Explain how cross over distortion occurs in class B power amplifier and the method to minimize it.

18. Draw the equivalent circuit at high frequencies for a CB amplifier. Determine high frequency poles. Comment on upper 3 dB frequency of the amplifier.

19. a) Compare the performance of CS and CD amplifiers.

   b) Consider an amplifier with poles at 1 MHz and 2 MHz. The zeros are much higher than 2 MHz. Calculate the upper 3 dB frequency.   **(6×10=60 Marks)**