B.Tech Sem – IV (2007 Course) (Electronics) : WINTER - 2018

SUBJECT: ELECTRONIC CIRCUITS

Day : Tuesday | **W-2018-2758** | Time : 02.30 PM TO 05.30 PM

Date : 13/11/2018 | Max. Marks: 80

N. B.:

1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** questions from each Section.
2) Figures to the right indicate **FULL** marks.
3) Answer to both the sections should be written in **SEPARATE** answer book.
4) Use of non-programmable electronic **CALCULATOR** is allowed.
5) Assume suitable data if necessary.

SECTION-I

Q.1 **a)** Compare frequency response of RC coupled amplifier and direct coupled amplifier. **(05)**

b) What are the advantages of negative feedback amplifier? **(05)**

c) Draw the symbol of op-amp and state the significance of each terminal. **(04)**

Q.2 **a)** Discuss the choice of the transistor configuration in a cascade amplifier. **(06)**

b) State various techniques used for improving the input impedance for CC stage and describe one in detail. **(07)**

Q.3 **a)** What is the effect of employing negative feedback on input resistance and output resistance of a voltage series feedback amplifier? Write the derivation for it. **(07)**

b) If an amplifier with lower 3dB frequency f_L, upper 3dB frequency f_H and mid frequency gain A_{mid} is used in feedback application with feedback factor β, show that lower 3dB frequency of feedback amplifier = $f_{Lf} = \frac{f_L}{1+\beta A_{mid}}$ and upper 3dB frequency of feedback amplifier = $f_{Hf} = f_H(1+\beta A_{mid})$. **(06)**

Q.4 **a)** What are the methods of improving CMRR? Explain one method in detail. **(07)**

b) Explain the block diagram of internal structure of op-amp stating function of each block. **(06)**

SECTION-II

Q.5 **a)** What is crossover distortion? Describe a method to minimize this distortion. **(05)**

b) With the help of circuit diagram explain zener diode as shunt voltage regulator. **(05)**

c) Write a function of resonance circuit in tuned amplifier. **(04)**

Q.6 **a)** What are the different distortions occur in a power amplifier? Show that even harmonics are cancelled at the output of a push pull class B power amplifier. **(07)**

b) Determine the percentage of second harmonic distortion for an amplifier supplying 1W power to a 10KΩ load. Assume zero signal dc collector current of 40 mA and dc collector current with signal as 46mA. **(06)**

Q.7 **a)** Describe foldback current limiting techniques. **(06)**

b) Explain with neat circuit diagram working of RC phase shift oscillator with three RC sections. **(07)**

Q.8 **a)** Give the typical values of hybrid π parameters with model. **(06)**

b) The following transistor measurements are made at I_C = 5mA and V_{CE} = 10V and at room temperature, h_{fe} = 100, h_{ie}= 600 Ω, $|A_i|$ = 10 at 10 MHz and C_C = 3pF. Find f_β, f_T, $r_{b'e}$ and $r_{bb'}$. **(07)**

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