

B.TECH SEM – IV (2007 COURSE) (BIOMEDICAL ENGG.) :
WINTER - 2017

SUBJECT : ELECTRONIC DEVICES AND CIRCUITS – II

Day : Friday
Date : 24/11/2017

W-2017-2438

Time : 02.30 PM TO 05.30 PM
Max. Marks: 80

N.B.

- 1) Q.1 and Q. 5 are **COMPULSORY**. Out of remaining solve **ANY TWO** questions from each section.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Answers to both the sections should be written in the **SEPARATE** answer books.
- 4) Draw neat and labeled diagram **WHEREVER** necessary.
- 5) Use of non-programmable electronic **CALCULATOR** is allowed.
- 6) Assume suitable data if necessary.

SECTION – I

- Q.1** a) Comment on effect of cascading on frequency response of cascaded amplifier. (05)
- b) What is the effect of employing negative feedback on input and output resistances of practical voltage amplifier? (05)
- c) Explain the concept of virtual ground. (04)
- Q.2** a) With necessary diagram and equation explain how bootstrapping technique improves the overall input impedance of emitter follower circuit. (07)
- b) Explain various coupling methods used in cascading amplifiers with circuit diagrams. (06)
- Q.3** a) In spite of its disadvantages of reduction in gain, negative feedback is invariably used in amplifiers. Justify this statement. (06)
- b) An R-C coupled amplifier has a voltage gain of 1000, $f_1 = 50\text{Hz}$, $f_2 = 200\text{KHz}$ and a distortion of 5% without feedback. Find the amplifier voltage gain, f_{HF} , f_{LF} and distortion when negative feedback is applied with feedback ratio of 0.01. (07)
- Q.4** a) Give reason: (06)
- i) Op-amp is not used as amplifier in the open-loop mode.
- ii) Negative feedback is preferred in op-amp used as amplifier.
- b) Explain the following parameters of op-amp and state their typical values for IC 741 : (07)
- i) Input Bias current ii) Input offset voltage
- iii) CMRR iv) Slew rate v) PSRR

SECTION – II

- Q.5** a) Explain how even harmonics gets eliminated in class B push-pull amplifier. (05)
- b) Define S_v , R_o and S_T . (04)
- c) Explain the working of staggered tuned amplifier. (05)
- Q.6** a) With the help of neat circuit diagram explain the operation of transformer coupled class A amplifier. (07)
- b) Explain with neat circuit diagram Hartley oscillator. (06)
- Q.7** a) Draw the neat diagram of emitter follower regulator and list design steps. (07)
- b) Explain the current foldback characteristics of IC 723 voltage regulator. (06)
- Q.8** a) Draw and explain the working of single tuned amplifier with the help of frequency response. (07)
- b) A BJT has $h_{ie} = 6\text{K}\Omega$ and $h_{fe} = 224$ at $I_C = 1\text{mA}$ with $f_T = 90\text{MHz}$ and $C_{b'c} = 13\text{pF}$. Determine (06)
- i) g_m ii) $r_{b'e}$ iii) $r_{bb'}$ and
- iv) $C_{b'e}$ at room temperature and a collector current of 1mA.

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