Total No. of printed pages = 7

CAI-506/EC&D-II/5th Sem/2017/N

ELECTRONIC CIRCUITS AND DEVICES -II

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

All questions are compulsory.

1. Choose the correct answer from the given options : 1×6=6

   (a) An electronic oscillator is

   (i) An amplifier

   (ii) An amplifier with feedback

   (iii) Converter of AC to DC

   (iv) Just like an alternator

(b) For generating 1 KHz frequency the most suitable circuit is

(i) Hartley oscillator

(ii) Wein bridge oscillator

(iii) Colpitt's oscillator

(iv) Tuned collector oscillator

(c) In RC phase shift oscillator circuit

(i) There is no need for feedback

(ii) BA<1

(iii) Pure sine wave output is possible

(iv) Transistor parameters determine oscillator frequency

(d) The negative feedback in an amplifier

(i) Reduces the voltage gain

(ii) Increases the voltage gain

(iii) Does not affect the voltage gain

(iv) None of the above

(e) SCR can be used as

(i) Converter

(ii) Inverter

(iii) Chopper

(iv) All of the above

(f) Common mode signals have _____.

(i) The same amplitude

(ii) The same phase

(iii) The same frequency

(iv) All of the above

2. Fill in the blanks : 1×12=12

(a) The open loop gain of an ideal OP-AMP is _____.

(b) A voltage follower has gain _____.

(c) The use of negative feedback in OP-AMP reduces _____.

(d) Circuit used to pass a specified band of frequencies while attenuating all the signals outside that band is called as _____.

(e) The resistance (R) of a low pass filter at a cut off frequency of 15.9 KHz with pass band gain 1.5 is _____.

(f) The application in which narrow band-reject filter can be used is _____.

(g) Number of feedback path present in narrow band pass filter _____.

(h) Differential circuits are less sensitive to _____.

(i) Output resistance of AC analysis of dual input balanced output differential amplifier is _____.

(j) Frequency range of DC amplifiers _____.

(k) Twin-T oscillator is a _____ feedback oscillator.

(l) Output voltage of IC 7915 is _____.

3. State whether the following statements are true or false. 1×7=7

(a) Precision rectifier is a circuit with operational amplifier which behave like a power amplifier.

(b) Feedback in an amplifier always help to increase its gain.

(c) Many Op-Amp parameters depend on the temperature.

(d) The change in the output voltage for a given change in the input voltage is called as load regulation.

(e) Voltage regulation is poor in shunt regulation.

(f) IC voltage regulators greatly simplifies power supply design.

(g) RC phase shift oscillator produce 9% of distortion level in the output.

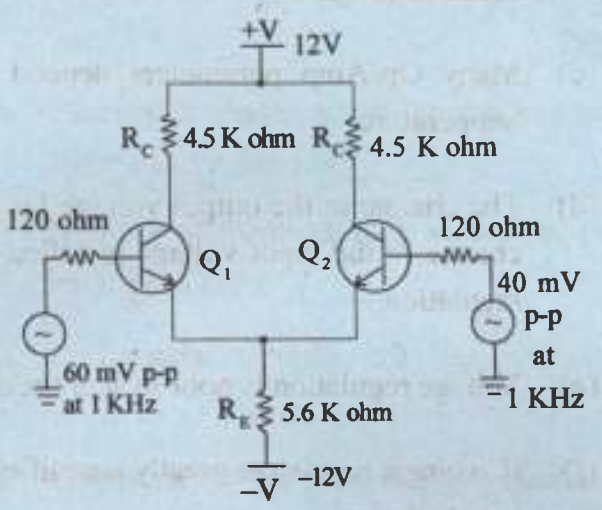
PART – B

Answer any *three* questions.

4. (a) Explain with circuit diagram the basic BJT differential amplifier. 4

(b) Describe DC analysis of BJT differential amplifier. 7

(c) Calculate the operating point of the following circuit : 4



5. (a) What is adjustable voltage regulator ? Derive the expression for the output voltage for LM 317 adjustable voltage regulator. 2+6=8

(b) What is negative feedback amplifier ? How does negative feedback help in increasing stability ? 5

(c) What is the advantage of active filters over passive filters ? 2

6. (a) What is tuned amplifier ? Give difference between single tuned and double tuned amplifier. 1+2=3

(b) Draw and explain circuit diagram of inductive coupling single tuned amplifier with its frequency response. 8

(c) Explain the working principle of half-wave precision rectifier. 4

7. (a) Explain the operation of Wien bridge oscillator and derive the frequency and condition for oscillation. 8

(b) Calculate the value of C1 = C2 for the Wien bridge oscillator to operate at a frequency of 20 KHz. Assume R1 = R2 = 50 KΩ. 2

(c) Write short note on any *one* of the following : 5

(i) SCR

(ii) Phase shift oscillator

(iii) Buck regulator.