Total No. of printed pages = 7

CAI-506/EC&D-II/5th Sem/2018/M

ELECTRONIC CIRCUITS AND DEVICES – II

Full Marks – 70

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 questions : 1×6=6

   (a) At low frequencies oscillator used is

   (i) Crystal oscillator

   (ii) LC oscillator

   (iii) RC oscillator

   (iv) None of the above

[Turn over

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

(i) Crystal oscillator

(ii) Wein bridge oscillator

(iii) Colpitt's oscillator

(iv) Tuned collector oscillator

(c) Crystal oscillator is used in

(i) Military

(ii) Voltage regulator

(iii) Feedback amplifier

(iv) None of the above

(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) Common mode signals have

(i) the same amplitude

(ii) the same phase

(iii) the same frequency

(iv) All of the above

(f) UJT can be used as

(i) switching device

(ii) phase control

(iii) over voltage detector

(iv) All of the above

2. Fill in the blanks : 1×12=12

(a) Bandwidth of an ideal OP-AMP is ———.

(b) Voltage gain of inverting amplifier is ———.

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

(d) The ratio of differential gain to common mode gain is ———.

(e) With zero volts in both the inputs an OP-Amp ideally should have a ———— output.

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

(g) Active filters are much sensitive to ————.

(h) Differential amplifier provides ———— input impedance.

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

(j) RC phase shift oscillator distortion level is ————.

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

(l) Output voltage of IC 7912 is ————.

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

(a) Precision rectifier is a circuit with operational amplifier which behaves like a FET.

(b) An ideal Op-Amp has large bandwidth.

(c) Common mode gain is very low.

(d) The differential amplifiers amplify difference between two signals.

(e) Voltage regulation is good in shunt regulation.

(f) Adjustable voltage regulator improves line and load regulation.

(g) Double tuned amplifier is used to increase the bandwidth.

SECTION – B

Answer any *three* questions.

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

(b) What is dual input unbalanced output differential amplifier configuration ? Give its circuit diagram and AC analysis and derive its differential voltage gain.

1+2+2+6=11

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

(b) Differentiate between negative feedback amplifier and positive feedback amplifier. 2

(c) How does negative feedback help in increasing stability ? 5

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

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

(c) Define line regulation and load regulation for IC voltage regulator. 4

4. (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 40 kHz. Assume R1 = R2 = 100 KΩ. 2

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

(i) Buck regulator

(ii) Switching power supply

(iii) Active filter.