Total No. of printed pages = 7

END SEMESTER EXAMINATION – 2021

Semester : 5th- (REGULAR)

Subject Code : CAI-506

ELECTRONIC CIRCUITS AND DEVICES - II

Full Marks – 70

Time – Three hours

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

Instructions :

1. *All* questions of PART – A are compulsory.
2. Answer any *five* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

   (a) Differential amplifiers are preferred for industrial application because _____.

   (b) Voltage gain of non-inverting amplifier is _____.

[Turn over

(c) Tuned amplifier uses _____ tank circuit.

(d) Band pass filter has _____ pass band and two stop band.

(e) Clock uses _____ oscillator.

(f) For AC analysis of the circuit +Vcc and –Vcc are set to _____.

(g) Differential amplifiers are less sensitive to_____.

(h) In a feedback amplifier Desensitivity factor is given as _____.

(i) Output voltage of IC 7805 is_____.

(j) Function of Op-amp in shunt regulator is _____.

2. Write true or false : 1×10=10

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

(b) AC analysis of differential amplifier is done to obtain differential voltage gain.

(c) +Vcc and $-V_{EE}$ for AC analysis are set to zero.

(d) Double tuned amplifier uses one parallel tuned circuit.

(e) Tank circuit uses resistance and capacitor.

(f) Intermediate stage of Op-amp provides additional gain.

(g) Common mode gain is very low.

(h) Line regulation is the change in the output voltage for a given change in the input power.

(i) RC coupled amplifiers are employed for amplification of low frequency signals.

(j) An ideal Op-amp has zero output resistance.

3. Choose the correct answer : 1×5=5

(a) A voltage follower

(i) has unity gain

(ii) is non-inverting

(iii) has no feedback resistor

(iv) All of the above

(b) Active filters are sensitive to

(i) Input frequency

(ii) Phase

(iii) Temperature

(iv) All of the above

(c) A common mode signal is applied to

(i) The non-inverting input

(ii) The inverting input

(iii) Both the inputs

(iv) Top of the tail resistor

(d) At high frequencies oscillator used is

(i) Crystal oscillator

(ii) LC oscillator

(iii) RC oscillator

(iv) None of the above

(e) In an LC circuit when the capacitor is maximum, the inductor is

(i) Maximum

(ii) Minimum

(iii) Half-way between maximum and minimum

(iv) None of the above.

PART – B

Marks – 45

4. (a) Give the advantages of differential amplifier. 2

(b) Determine operating point of DC analysis of BJT differential amplifier. 7

5. (a) What is tuned amplifier ? Why tuned amplifier cannot be used in audio frequency amplification ? 3

(b) With the help of a neat circuit diagram explain tuned amplifier with inductive coupling. 6

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

(b) Write the advantages of Wien bridge oscillator. 2

7. (a) Explain the operation of full wave precision rectifier with circuit diagram and give its waveform. 6

(b) Draw the frequency response of ideal low pass filter and high pass filter. 3

8. (a) Explain the block diagram of basic three terminal IC regulator. Also give the advantage of IC voltage regulator. 6+2=8

(b) What do you mean by ripple rejection in voltage regulator ? 1

9. (a) Give the advantages of negative feedback amplifier. How does negative feedback help in increasing stability ? 6

(b) Write the basic feedback topologies. 2

(c) State true or false: For negative feedback $\beta A > 0$. 1

10. Explain the working of Diac giving its construction and V-I characteristics. 9

11. With the help of AC analysis find differential voltage gain of dual input balanced output differential amplifier. 9