Total No. of printed pages = 6

Et-405/AE-II/4th Sem/2018/M

ANALOG ELECTRONICS - II

Full Marks – 70

Time – Three hours

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

PART – A

Marks – 25

1. State true or false : $1 \times 7 = 7$

   (i) In a JFET the current flows due to holes as well as electrons.

   (ii) The conduction region of a UJT is actually a negative resistance region.

   (iii) The output of a differential amplifier is proportional to the differentiation of input signals.

   (iv) Basically an Op-Amp is a direct-coupled high-gain voltage amplifier.

   (v) An integrator circuit is also a low-pass filter.

[Turn over

(vi) Astable multivibrator circuit can be used for reconstruction of distorted pulse signals.

(vii) Sweep signals are essentially used for CRT based display systems.

2. Fill up the gaps : $1 \times 8 = 8$

(i) UJT is sometimes called a _____ diode.

(ii) In a JFET, when no gate voltage is applied the channel acts like a _____.

(iii) Ideally the CMRR of an Op-Amp should be _____.

(iv) A comparator circuit makes a _____ output when inputs are equal.

(v) In a diode clamper circuit the capacitor acts like a _____.

(vi) An IC-7805 is used to obtain _____ volt DC regulated output.

(vii) _____ circuit can be very well used to convert a sine-wave to square-wave.

(viii) Miller integrator circuit typically produces _____ waveform.

3. Choose the correct answer : $1 \times 10 = 10$

(i) An UJT contains

(a) four p-n junctions

(b) three p-n junctions

(c) two p-n junctions

(d) one p-n junction

(ii) A MOSFET has

(a) high input resistance

(b) high output resistance

(c) high power rating

(d) high frequency rating

(iii) A differential amplifier can amplify

(a) only DC signals

(b) only AC signals

(c) both AC and DC signals

(d) None of these

(iv) In an ideal Op-Amp the output impedance is

(a) 50 ohms

(b) 100 ohm

(c) infinite

(d) zero

(v) In an Op-Amp differentiator circuit the feedback path comprises of a

(a) resistor

(b) inductor

(c) capacitor

(d) diode

(vi) An ideal regulated power supply is the one which has a regulation of

(a) 0%

(b) 1%

(c) 5%

(d) 10%

(vii) A clamping circuit is used to -

(a) amplifies a signal

(b) shift the average level of a signal,

(c) remove a portion of a waveform

(d) changes the shape of a waveform

(viii) Multivibartors belong to the category of-

(a) Sinusoidal oscillators

(b) Triangular wave oscillators,

(c) Ramp oscillators

(d) Square wave oscillators

(ix) A bi-stable multivibrator has

(a) one stable state

(b) two stable states

(c) one quasi-stable state

(d) two quasi-stable states

(x) Bootstrap sweep circuit generally employs

(a) Emitter Follower

(b) CE Amplifier

(c) CB Amplifier

(d) Tuned Amplifier.

PART – B

Marks – 45

Answer any *three* questions.

4. Using neat diagrams where necessary, explain the working of a Uni-Junction Transistor (UJT). 15

5. Mention the characteristics of an ideal Operational Amplifier. Also, explain how an Op-Amp can be used as an Inverting Amplifier and Integrator. 5+10=15

6. Classify filter circuits and explain the working of RC High-Pass and Low-Pass filter. 6+9=15

7. Differentiate between the three types of Multivibrators and using neat circuit and waveforms, explain the working of any one of them. 3+12=15

8. Write short notes on any *two* from the followings : 2×7.5=15

   (a) BJT v/s FET.

   (b) UJT Relaxation Oscillator

   (c) Transistor as a Switch.

   (d) Diode Clippers

   (e) Miller Sweep Generator.