Bachelor of Science (F.Y.B.Sc.) (PART-I) (CBCS Pattern) Second Semester CBCS

USELT03 - Electronics Paper-I
(Unipolar Devices and Linear Integrated Circuits)

P. Pages : 2 **GUG/W/18/11578**

Time : Three Hours * 3 6 5 3 * Max. Marks : 50

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat diagram wherever necessary.
3. Use of log table/calculator is allowed.

1. Either.

a) Distinguish between BJT and FET. Explain the construction and working of N-Channel JFET. **3+7**

OR

b) Explain the construction and working of UJT. Draw the V-I characteristics of UJT and explain. **6+4**

2. Either.

a) Draw the circuit diagram of two stage RC coupled amplifier and explain its working. Draw the frequency response curve. **7+3**

OR

b) Define Barkhausen criterion for sustained oscillations. Draw and explain the working of phase shift oscillator. **2+8**

3. Either.

a) What are the advantages of operational amplifier over normal amplifier. Draw the circuit diagram of difference amplifier and explain its working. **3+7**

OR

b) Draw the block diagram of operational amplifier and explain the function of each block. **10**

4. Either.

a) Draw and explain the working of op-amp as an inverting amplifier. Explain the concept of virtual ground. **7+3**

OR

b) With suitable diagram explain the working of op-amp as an integrator. **3+7**

5. Attempt **any ten** of the following. **1x10**

a) What is FET?

b) What is pinch off voltage?

c) State the advantages of MOSFET.

d) Define Bandwidth of amplifier.

e) What is oscillator?

f) State formula of frequency for Colpitt's oscillator.

g) State any two characteristics of Ideal op-amp.

h) Define close loop gain in op-amp.

i) State any two advantages of DC amplifier.

j) What is unity gain amplifier?

k) State the formula of output voltage of differentiator, using op-amp.

l) In Non-inverting op-amp $R_i = 10 k\Omega$. and $R_f = 12 k\Omega$. calculate the gain.

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