B.TECH SEM - IV (2007 COURSE) (E & TC ENGG.) :
WINTER - 2017
SUBJECT: ELECTRONIC CIRCUITS

02.30 PM TO 05.30 PM

Day: **Monday**   Time:

Date: **20/11/2017**   **W-2017-2439**   Max Marks. 80

N.B.

1) Q. No. 1 and 5 are **COMPULSORY**.
2) Out of remaining questions attempt any **TWO** questions from each section.
3) Figures to the right indicate **FULL** marks.
4) Answers of both the sections should be written in **SEPARATE** answer book.
5) Draw neat diagram **WHEREVER** necessary.
6) Use of non – programmable calculator is **ALLOWED**

SECTION - I

Q.1 **a)** Which gates are the universal gates? How NOR gate is implemented with   **(05)** CMOS family?

b) How power amplifier is classified? Analyze each class with it's graphical   **(05)** analysis?

c) Prove that in tuned amplifiers   **(04)**

$$f_r = \frac{1}{2\pi\sqrt{LC}} \; .$$

Q.2 **a)** Analyze construction of VMOSFET.   **(06)**

b) What is thermal resistance? Which factors affects thermal resistance?   **(07)** Analyze thermal equivalent circuit in detail.

Q.3 **a)** Which type of class A amplifier is used for impedance matching? Analyze it   **(06)** in detail.

b) For a class B push pull amplifier operating on a 30 V supply, the collector   **(07)** voltage of each transistor swings from 30 volt that is VCC to 6 volt. with application of the input signal. Each transistor has the maximum collector dissipation rating of 10 W. Calculate:

i) Output power

ii) DC input power

iii) Collector circuit efficiency

Assume [N1/N2] = 1.

Q.4 **a)** Analyze modified T equivalent circuit of CE amplifier in detail.   **(06)**

b) What is double tune amplifier? How it is comparable with single tune   **(07)** amplifier?

P.T.O.

SECTION - II

Q.5 **a)** What is the effect of employing negative feedback in amplifiers, gain, **(05)** bandwidth and nonlinear distortion?

b) What is RC oscillator? Analyze any one type of RC oscillator. **(05)**

c) How stability of regulator will be improved? **(04)**

Q.6 **a)** What is a trans-conductance amplifier? Analyze it in detail with circuit **(06)** diagram.

b) If an amplifier has a bandwidth of 350 KH_Z and a voltage gain of 100, what **(07)** will be the new bandwidth and gain if 6% negative feedback is introduced? What is the product if gain and bandwidth before and after adding negative feedback? What should be the amount of feedback, if the bandwidth is restricted to 1 MH_Z?

Q.7 **a)** For Hartley oscillator L_1 = 200 mH, L_2=210mH and C=0.01 μF. What will be **(07)** the frequency of oscillations?

b) Analyze and explain BJT phase shift oscillator. **(06)**

Q.8 **a)** Design an adjustable output voltage regulator circuit using IC 317 to give 3 **(07)** to 10 V at I $_L$=1 Amp. Given (I_{ADJ}=100 μA and R_1 = 230Ω).

b) What are S_V, S_t and R_O parameters for the regulator? **(06)**