

**B.TECH. SEM -IV E & TC 2014 COURSE (CBCS) : SUMMER -  
2018**

**SUBJECT : APPLIED ELECTRONIC CIRCUITS**

Day : **Tuesday**  
Date : **05/06/2018**

Time : **10.00 AM TO 01.00 PM**  
Max. Marks : 60

**S-2018-2316**

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagram **WHEREVER** necessary.
- 5) Assume suitable data if necessary.

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- Q.1** a) What are multistage amplifiers? [04]  
b) Derive the equation for the overall voltage gain of a multistage amplifier in terms of the individual voltage gains. [06]

**OR**

- a) What is the darlington transistor? What are its salient features? [03]  
b) What is transformer coupled multistage amplifier? Derive the mid-frequency current and voltage gain for the above said amplifier. [07]

- Q.2** a) What will be the effect of negative feedback on the input resistance of voltage series feedback amplifier? [05]  
b) An amplifier has a voltage gain of 400,  $f_1 = 50\text{Hz}$ ,  $f_2 = 200\text{KHz}$  and a distortion of 10% without feedback. Determine the amplifier voltage gain,  $f_{1f}$ ,  $f_{2f}$  and  $D_f$  when a negative feedback is applied with feedback ratio of 0.01. [05]

**OR**

- a) What will be the effect of negative feedback on the output resistance of voltage shunt feedback amplifier? [05]  
b) A voltage series negative feedback amplifier has a voltage gain without feedback of  $A = 500$ , i/p resistance  $R_i = 3\text{K}\Omega$ , output resistance  $R_o = 20\text{K}\Omega$  and feedback ratio  $\beta = 0.01$ . Calculate the voltage gain  $A_f$ , input resistance  $R_{if}$  and output resistance  $R_{of}$  of the amplifier with feedback. [05]

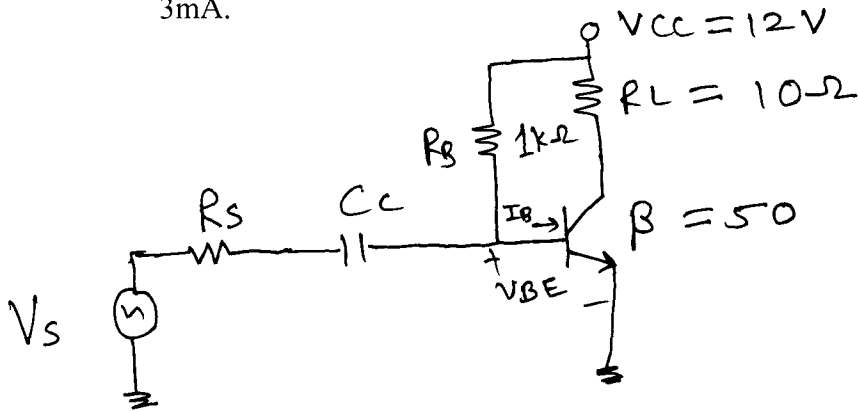
- Q.3** a) Differentiate all classes of power amplifiers for common parameters. [05]  
b) Derive efficiency of class A power amplifier with a suitable circuit diagram. [05]

**OR**

- a) Which are the general features of power amplifiers? [04]

**P.T.O.**

- b) For the shown class A directly coupled power amplifier, calculate  $V_{CEQ}$ ,  $I_{CQ}$ ,  $P_{dc}$ ,  $P_{ac}$  and efficiency if  $\beta = 50$  and the RMS base current due to ac input is 3mA. [06]



- Q.4 a) How does an oscillator operate without an a.c. input signal? [04]

- b) What is Hartley oscillator? Derive oscillation frequency for the same. [06]

OR

- a) What is the effect of  $|AB|$  on the nature of oscillations? [04]

- b) Determine the frequency of oscillations of a clapp oscillator if the component values are as follows:  $C_1 = 120\text{pF}$ ,  $C_2 = 1.5\text{nF}$ ,  $C_3 = 15\text{pF}$  and  $L_3 = 10\mu\text{H}$ . [06]

- Q.5 a) What is load regulation and line regulation? [04]

- b) Design adjustable voltage regulator using IC 7805 to vary the output voltage between 5 and 7 volts. [06]

OR

- a) Why zener diode is used as shunt regulator? [04]

- b) What is 79xx series in regulators? Design circuit diagram of regulator using IC7912 and state the required equations for the same for fix and variable output voltage. [06]

- Q.6 a) Derive lower cut off-frequency for high frequency amplifier. [05]

- b) The short circuit CE gain of a transistor is 20 at 2MHz. The value of  $f_\beta$  is known to be equal to 150 KHz. Calculate the following  $f_T$ ,  $h_{fe}$  and current gain at  $f = 5\text{MHz}$  and  $50\text{MHz}$ . [05]

OR

- a) What is high frequency T model of BJT amplifier? [06]

- b) Why hybrid  $\pi$  model is preferred for high frequency analysis? [04]

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