

**B.Tech. SEM -IV E & TC 2014 Course (CBCS) : SUMMER - 2019**  
**SUBJECT: APPLIED ELECTRONIC CIRCUITS**

Day: Saturday  
Date: 25/05/2019

S-2019-2636

Time: 10.00 AM TO 01.00 PM  
Max Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw appropriate diagram **WHEREVER** necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.

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- Q.1** a) Derive mid band frequency voltage gain of RC coupled amplifier. (06)  
b) What is cascode amplifier? (04)

**OR**

- Q.1** a) How the direct coupled amplifier is developed? (06)  
b) A CE, RC coupled amplifier uses transistors with  $h_{fe}=50$ ,  $h_{ie}=1200\Omega$ ,  $h_{oe}=30 \times 10^{-6}$  mho,  $h_{re}=2.5 \times 10^{-4}$ . The value of  $g_m$  at the operating point is 40 mmhos. The biasing resistor  $R_1$  between  $V_{CC}$  and base is  $110K\Omega$  and  $R_2$  between base and ground is  $10K\Omega$ . The load resistor  $R_c=5K\Omega$ . Find  $R_o$ ,  $R_b$ ,  $R_i$ , and  $r_b'e$ . (04)

- Q.2** a) With neat circuit diagram analyze voltage series feedback amplifier. (06)  
b) A current series feedback amplifier has a trans-conductance  $G_m = 500$ , Input resistance  $R_i=3Kohm$ , output resistance  $R_o= 20Kohm$  and feedback ratio  $\beta=0.01$ . Find  $G_{mf}$ ,  $R_{if}$  and  $R_{of}$ . (04)

**OR**

- Q.2** a) What is desensitization of gain in negative feedback amplifier? (06)  
b) An amplifier has a basic voltage gain of 350,  $F_1=55Hz$  and  $F_2=250KHz$  and a distortion of 8% without feedback. Determine the amplifier voltage gain,  $F_{1f}$ ,  $F_{2f}$  with  $D_f$  when negative feedback is applied with  $\beta=0.02$ . (04)

- Q.3** a) Analyze efficiency of class B amplifier. (08)  
b) In the transformer coupled amplifier,  $R_L=150ohm$  and turns ratio is 5:2; find reflected load towards primary. (02)

**OR**

- Q.3** a) What is class C power amplifier? (05)  
b) What are the important features of power amplifiers? (05)

**P.T.O.**

- Q.4 a) In Colpitt's oscillator  $C_1=102\text{pf}$  and  $C_2=7513\text{pf}$ . The inductance is variable. (06)  
Determine the range of inductance if the frequency of oscillation is to vary between 900KHz to 2000KHz.
- b) What is crystal oscillator? (04)

OR

- Q.4 a) In Hartley oscillator  $L_2=0.4\text{mH}$  and  $C=0.004\mu\text{F}$ . If the frequency of the oscillator is 120KHz. Find  $L_1$ ,  $h_{fe}$  and  $A$  for the oscillator. (03)
- b) What is Wien bridge oscillator? What is  $h_{fe}$  and basic gain  $A$  in the Wien bridge oscillator? (07)

- Q.5 a) Find load regulation and % load regulation when the output voltage varies from 10.9V to 12V. (04)
- b) Which are the protection circuits used in regulators? (06)

OR

- Q.5 a) Design +12V regulator using IC 78xx series regulator. (05)
- b) What is linear transistorized series voltage regulator? (05)

- Q.6 a) Design  $\pi$  model of CE amplifier at high frequency. (07)
- b) What is virtual base in transistor? (03)

OR

- Q.6 a) What are the advantages of T model of CE amplifier? (05)
- b) Why frequency ranges are classified? What is the importance of the same? (05)

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