KUMARAGURU
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B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Third Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U13ECT303: Electronics Circuits -I

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The stabilization techniques refer to the use of …………….. for biasing the transistor

   a) Resistive components   b) Capacitive components

   c) Inductive components   d) diode

2. The spacing of the output characteristics will increase or decrease (for equal changes in I_B)

   as …………….. increases or decreases

3. A differential amplifier has a differential gain of 20,000 . CMRR=80 dB. The common mode gain is given by

   a) 2   b) 1

   c) 1/2   d) 0

4. In h-Parameter model ………………. refers to the forward transfer current gain

5. An n- channel JFET has I_{DSS}=2mA,and Vp=-4v.Its transconductance gm=(in mA/V)for an applied gate to source voltage VGS=-2v is

   a) 0.25   b) 0.5

   c) 0.75   d) 1

6. A field-effect transistor amplifier provides excellent voltage gain with the added feature of a

   _____ input impedance.

7. The gain of a transistor amplifier falls at high frequency due to the

   a) Internal capacitance of the device   b) Coupling capacitor at the input

   c) Skin effect   d) Coupling capacitor at the output

8. For a multistage amplifier (n- identical stages) the cut off frequencies in the low and high

   frequency region are …………… and …………………

9. Which of the following is a main function of the transformer used in the output of a power

   amplifiers

   a) To increase the output power   b) To increase the voltage gain

c) To match the load with the output   d) To decrease the output power resistance of a transistor

10. Class _____ amplifiers are normally operated in a push-pull configuration in order to produce an output that is a replica of the input.

PART B (10 x 2 = 20 Marks)
(Not more than 40 words)

11. Define Stability factor of an amplifier. What is its ideal value?
12. Draw two different circuits for JFET as an amplifier.
13. Compare BJT and JFET amplifiers.
14. What is the significance of a Darlington pair amplifier?
15. Draw the small signal model of common source amplifier.
16. Sketch the E-MOSFET amplifier with drain feedback.
17. What is the effect of emitter by pass capacitor on the frequency response of CE amplifier?
18. Draw the ac equivalent circuit of High frequency common emitter amplifier.
19. Mention the advantage and disadvantage of a transformer coupled amplifier.
20. Give the formula to calculate the efficiency of a Class A amplifier and find efficiency for the given value $P_{ac} = 5W$ & $P_{dc} = 20w$.

PART C (5 x 14 = 70 Marks)
(Not more than 400 words)

Q.No. 21 is Compulsory

21.   i) Explain using circuit diagram and waveforms the operation of Class B push – pull power amplifier using transistors and derive its efficiency.   (10)

      ii) What is cross over distortion? How is it eliminated?   (4)

22. a) Carry out the bias stability analysis for the voltage divider bias of BJT and hence determine the stability factors.

(OR)

   b) i) What is thermal runaway? What is the condition to achieve thermal stability? (8) Explain.

      ii) Explain one bias compensation method to improve stability.   (6)

23. a) Derive the expression for voltage gain, current gain, power gain, input and output impedances for a CE BJT amplifier using h-parameter analysis.

(OR)

b)   i)   Draw a differential amplifier and equivalent circuit. Derive the expression for   (10) CMRR.

      ii)   How can CMRR be improved? Explain.   (4)

24.   a)   i)   Explain the different biasing methods of JFET with circuit diagrams.   (10)

      ii)   Determine V_{GSQ} and I_{DQ} for JFET fixed bias network with R_G= 1Mohm,   (4) V_{GG} = -2V. The device parameters are I_{DSS}= 10 mA and V_P= -8V.

(OR)

b)   Derive the expression for the voltage gain of Common source (self bias with unbypassed R_S) and common drain amplifier configuration under small signal low frequency conditions.

25.   a)   Derive the expression for Short circuit current gain of a CE Amplifier in high frequency region using hybrid π model.

(OR)

b)   Explain low frequency and high frequency response of BJT amplifier and derive the expression for critical frequencies for a CE amplifier.

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