Register Number.....

B.E. DEGREE EXAMINATIONS: NOVEMBER 2009

Third Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U07EC305: Electronic Circuits I

ree Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

positive swing of the output signal starts clipping first when Q point of the circuit es

o the center of the load line
b) Two third way of the load line
owards the saturation point
d) Towards the cutoff point

AC load line of a transistor circuit is steeper than its DC line because

AC signal sees less load resistance
b) It has steeper slope
c is higher
d) Input signal varies in magnitude

e Voltage Gain of a well designed single stage CB Amplifier is essentially determined by

C collector load and

Emitter resistance R_E
b) AC alpha
Input resistance of Emitter diode
d) AC Beta

arlington Pair are frequently used in Linear IC 's because they

) Do not require any capacitors or inductors
) Have enormous impedance transformation capability
) Can be readily formed from two adjacent transistor
) Resemble Emitter follower

The Bandwidth of an amplifier may be increased by

a) Decreasing the capacitance of its bypass capacitors
b) Minimizing its stray capacitances
c) Increasing its input signal frequency
d) Cascading it

The main reason for the variation of amplifier gain with frequency is

a) The presence of capacitances, both external & internal
b) Due to interstate transformers
c) The logarithmic increase in its output power
d) Miller effect

In a Class A Amplifier conduction extends over 360 degree because Q -point is

a) Located on Load line
b) Located near saturation point
c) Centered on load line
d) Located at or near cutoff points

8) The primary cause of linear distortion in amplifiers is

a) Change of gain with frequency

b) Unequal phase shift in component frequency

c) Reactance associated with the circuits & active amplifying element

d) Inherent limitations of the active device

9) The output of a half wave rectifier is suitable only for

a) Running car radios b) Charging batteries

c) Running AC motors d) Running tape recorders

10) Which stage of DC power supply uses a zener as the main component

a) Rectifier b) Voltage divider c) Regulator d) Filter

PART B (10 x 2 = 20 Marks)

11) List out the different types of FET biasing methods.

12) In a collector to base CE amplifier circuit having V_{CC} = 12 V, R_C = 250Ω, I_B = 0.25m
β = 100 and V_{CEQ} = 8V. Calculate the stability factor S.

13) Give the small signal model for FET in CS mode.

14) Determine the current gain for the Darlington connection of two identical transisto
having a current gain of β=100.

15) Name the two factors that define 3-db point at high frequency.

16) Write down the types of distortion that may occur in case of the amplifier.

17) Define complementary symmetry amplifier.

18) Draw the input and output waveform for class C amplifier.

19) State the reason for connecting a bleeder resistor in LC filter.

20) Define line regulation.

PART C (5 x 14 = 70 Marks)

21 a) i) In biasing with feedback resistor method, a silicon transistor with feedback resi
used. The operating point is at 7 V, 1 mA and V_{CC} = 12 V. Assume β = 100. Dete
1) the value of R_B 2) stability factor 3) what will be the new operating point if β
with all other circuit values are same.

ii) Derive an expression for the stability factor of a collector to base bias circuit.

(OR)

b) i) Draw and explain the voltage divider bias circuit.

ii) Derive an expression for the stability factor S, S' and S' for voltage divide
circuit.

raw the biasing circuit of darlington emitter follower circuit and derive the expression or voltage gain, current gain, input impedance and output impedance.

(OR)

Draw the circuit diagram of an emitter coupled BJT differential amplifier with resistive load and derive the expression for differential gain, common mode gain, CMRR, input impedance and output impedance.

) Discuss the effect of emitter bypass capacitor (C_E) and coupling capacitor (C_C) on low frequency response of BJT amplifiers.

(OR)

b) Draw the equivalent circuit of common source amplifier at high frequencies and derive expression for voltage gain, input admittance, input capacitance and output admittance

a) i) What are different types of distortion in ampliers? Explain. (8)

ii) Briefly explain the commonly available heat sinks. (6)

(OR)

b) i) Draw the circuit diagram of class B complementary symmetry push pull amplifier and explain its working. (8)

ii) In a Class A amplifier $V_{CE(max)} = 15V$ $V_{CE(min)} = 1V$. Find the overall efficiency for 1) series fed load 2) transformer coupled load (6)

25 a) i)Explain the operation of switched mode power supply in detail with a neat block diagram. (8)

ii) Explain the different types of SMPS. (6)

(OR)

b) i) Derive an expression for the ripple factor of a full wave rectifier using shunt capacitor filter. (7)

ii) Derive an expression for the ripple factor of a full wave rectifier using series inductor filter. (7)

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