B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010

Fourth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07EE402: Electronic Circuits

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

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. In a common emitter configuration, in order to have a better stability factor, the ratio _____ has to be small.

   (a) $\dfrac{R_B}{R_E}$ (b) $\dfrac{R_E}{R_B}$ (c) $\dfrac{R_B}{R_C}$ (d) $\dfrac{R_C}{R_B}$

2. The h parameter h_{22} refers to

   (a) output impedance   (b) input admittance   (c) output admittance   (d) input impedance

3. The ideal value of CMRR is _____.

   (a) zero   (b) infinite   (c) unity   (d) 3

4. The most important use of darlington pair is _____.

   (a) high voltage gain   (b) low voltage gain   (c) high power gain   (d) high current gain

5. The improvement of frequency response in amplifiers is due to the effect of _____.

   (a) negative feedback   (b) positive feedback   (c) either A or B   (d) open loop system

6. _____ is a circuit which generates an output waveform at any desired frequency, without any external input signal

   (a) A rectifier   (b) An oscillator   (c) An amplifier   (d) A regulator

7. A pulse input can be converted to spikes using _____.

   (a) low pass RC circuit   (b) low pass RL circuit

   (c) high pass RC circuit   (d) high pass RL circuit

8. A two way parallel clipper can be obtained by combining

   (a) a positive clipper and a negative clipper   (b) 2 positive clippers

   (c) two negative clippers   (d) a positive clamper and a negative clamper

9. The rectification efficiency of a full wave rectifier is

   (a) 40.6%   (b) 81.6%   (c) 40.2%   (d) 81.2%

10. For which type of filter, is the ripple value given by $\dfrac{\sqrt{2}}{3\omega^4 L_1 L_2 C_1 C_2}$

    (a) choke filter   (b) LC filter   (c) multiple L section filter   (d) CLC filter

PART B (10 x 2 = 20 Marks)

11. What is stability factor?

12. What are the conditions to be met with by the transistors used in complimentary symmetry amplifiers?

13. What are the ideal values of (a) Common mode gain (b) difference mode gain.

14. What are the classification of tuned amplifiers?

15. Give any two advantages of using negative feedback amplifiers?

16. What are the conditions for sustained oscillations?

17. What is the stable state of a bistable multivibrator?

18. Differentiate between clippers and clampers.

19. Define PIV of a rectifier with an example.

20. Define voltage regulator.

PART C (5 x 14 = 70 Marks)

21.(a) Draw the class B push pull amplifier circuit and explain its construction. Discuss on DC power input and AC power output and thus find its efficiency.

(OR)

(b) Analyse a single stage transistor amplifier using h - parameters and derive expression for current gain and voltage gain.

22. (a) Draw and explain a single tuned amplifier and its equivalent circuit operation. How does gain vary with frequency?

(OR)

(b) (i) How is constant current source helpful in improving the performance of a differential amplifier? (2)

(ii) Define the following and give their typical numerical values: (12)
(1) Output impedance (2) Input bias current (3) input offset current (4) PSRR

23. (a) Draw the circuit diagram of an oscillator which produces audio frequencies using a two stage amplifier. Explain its operation and derive expression for its frequency of oscillation.

(OR)

(b) (i) Derive R_0 and R_{of} a voltage series feedback amplifier. (8)

(ii) What must be the minimum h_{fe} value of transistor to be used as RC phase shift oscillator with collector resistance $= 10K\Omega$ and $R_{in} = 7\ K\Omega$. (6)

24. (a) (i) Explain bistable multivibrator operation. (8)

(ii) What is the modification done to the bistable multivibrator circuit to get Monostable operation? Briefly explain. (6)

(OR)

(b) Explain UJT based sawtooth oscillator and determine its frequency of oscillation.

25. (a) Draw the block diagram of SMPS and explain its operation and give its advantages.

(OR)

(b) Describe the working of fullwave rectifier with LC filter and derive its ripple factor.

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