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Register Number:………….

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fourth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

ECE106: Electronic Circuits II

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The type of amplifier, in which the input signal is voltage and output signal is current, is named as
   a) Transresistance amplifier   b) Transconductance amplifier
   c) Voltage amplifier   d) Current ampifier

2. BJT emitter follower is case of --------------------------- feedback amplifier
   a) Current series   b) Voltage shunt
   c) Voltage series   d) Current shunt

3. The measure of the ability of the oscillator to maintain as nearly a fixed frequency as possible over as long a time interval as possible is termed as
   a) Frequency stability   b) Under damped oscillations
   c) Over damped oscillation   d) Frequency instabilty

4. The range of frequencies for LC oscillator is ---------------
   a) 20 Hz to 20KHZ   b) 200 Hz to 20KHZ
   c) 200 KHz to few GHz   d) 2 KHz to 20KHZ

5. Small signal tuned amplifier is operated under --------------------operation.
   a) Class A   b) Class B
   c) Class AB   d) Class c

6. Class C amplifier output is obtained for--------------------
   a) more than half cycle   b) Less than half cycle
   c) more than full cycle cycle   d) Less than full cycle

7. A comparator circuit that changes the state whenever the input crosses a trigger point is-------

   a) Squaring circuit   b) Level detector

   c) Schmitt trigger   d) All of these

8. A monostable multivibrator circuit generates a fast transition at a predetermined time T after the input trigger and hence referred as------

   a) Triggering circuit   b) Delay circuit

   c) Pulsed circuit   d) Rc timing circuit

9. The output of an active device coupled back to the input through pulse transformer is called ----

   a) Pulse transformers   b) Saw toothed generators

   c) Push pull circuit   d) Blocking oscillator

10. Switching characteristics of the circuit is improved in bistable multivibrator by using--------

   a) Steering diodes   b) Commutating capacitor

   c) triggering   d) Series resistor

PART B (10 x 2 = 20 Marks)

11. Justify that negative feedback increases the bandwidth.

12. State the effect on output resistance and on the input resistance of an amplifier when current shunt feedback is employed.

13. Mention the two essential conditions for a circuit to maintain oscillation.

14. A weinbridge oscillator is used for operation at 9 KHz. If the value of resistance R is 100k ohms, what is the value of C required?

15. What is the effect of cascading n stages of single tuned amplifier (synchronously tuned) on the overall 3dB bandwidth.

16. Why does tuned amplifier needs neutralization? Draw the circuit of narrow band neutralization

17. What is meant by clipper circuit

18. A 25 KHz , 75% duty cycle square wave is used to trigger continuously a monostable multivibrator with a triggered pulse duration of 5μ Sec. What will be the duty cycle of the waveform generated at the output of monostable multivibrator?

19. Draw a transistorized bootstrapped time base generator circuit

20. What are the applications of blocking oscillator?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain how the negative feedback acts on bandwidth, input impedance, output (10) impedance and distortion of a circuit.

(ii) An amplifier has a mid frequency gain of 100 and bandwidth of 200 KHz. What will be the new gain and bandwidth if a negative feedback of 5% is introduced? (4)

(OR)

b) (i) Draw the circuits of voltage shunt and current series feedback amplifiers and determine the input resistance R_{if}. (10)

(ii) An amplifier without feedback has a voltage gain of 100, lower cut off frequency of 50 Hz, upper cutoff frequency of 200 k Hz and a distortion of 10 %. Determine the voltage gain, lower cutoff frequency, upper cut off frequency and distortion when a negative feedback is applied with a feedback ratio of 0.01. (4)

22. a) (i) Derive the general condition for oscillation of an LC oscillator and derive the frequency of oscillation of colpitts oscillator. (10)

(ii) How is clapp oscillator modified from colpitts oscillator? Explain. (4)

(OR)

b) (i) Sketch the block diagram of an oscillator and explain how it works. If the gain of amplifier is A and feedback factor is β, sketch the output waveform for the three cases i) $|A\beta| > 1$ ii) $|A\beta| < 1$ iii) $|A\beta| = 1$. Derive the conditions for sustained oscillations. (8)

(ii) Make a table of comparison of RC phase shift oscillator and wein bridge oscillator bringing out the similarities and differences. (6)

23. a) (i) Discuss about the double tuned voltage amplifier. (8)

(ii) Discuss the effect of bandwidth on cascading of single tuned amplifier. (6)

(OR)

b) Explain with suitable circuit diagrams Hazetline neutralization and coil neutralization techniques.

24. a) With a neat circuit diagram and suitable waveforms the operation of collector coupled transistor monostable multivibrator.

(OR)

b) Analyze the response of low pass RC circuit for sinusoidal, step, pulse,square wave and ramp inputs.

25. a) (i) Sketch a current time base circuit and explain its working with relevant waveforms. (10)

(ii) Design a UJT relaxation oscillator to generate a sawtooth waveform at a frequency of 500 M Hz. Assume the supply voltage Vbb =20V, V_V = 2.9 V , V_P = 1.118 V, I_P= 1.6mA and I_V = 3.5 mA. Also specify further assumption needed if any. Sketch the circuit designed. (4)

(OR)

b) With neat sketches explain the working principle of monostable blocking oscillator with emitter timing.

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