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(Pages : 3) **6557**

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, November 2014
(2013 Scheme)
13.304 : ELECTRONIC DEVICES AND CIRCUITS (FR)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions briefly. **Each** question carries **2** marks.

1. Which is more stable configuration, CB or CE ? Why ?
2. If two CE stages, each with f_L = 30 Hz and A_V = 60 are cascaded, what is the resultant lower cut off frequency of the cascaded combination ?
3. Why two stage transistorised amplifiers required in the Wienbridge oscillator circuit ?
4. List the merits and demerits of SMPS compared to a linear regulated power supply.
5. In a RC differentiating circuit, why the capacitor is named sometimes as blocking capacitor ?
6. Why a step-down transformer is used in the output circuit of a power amplifier ?
7. What is cross-over distortion ? What is the cause of it ?
8. Give reason for the slope for the voltage transfer characteristics in the initial region of the op-amp.
9. How the threshold voltage of the MOS transistor is adjusted ?
10. Why LCD is not operated from ac supply of frequency lower than 25 Hz and higher than 50 Hz ?

(10×2=20 Marks)

P.T.O.

PART – B

Answer **any one** full question from **each** Module. **Each** full question carries **20** marks.

Module – I

11. Draw the circuit diagram of a 2 stage RC coupled CE amplifier. Derive equations for its
    i) overall voltage gain
    ii) input resistance
    iii) lower cut off frequency and
    iv) upper cut-off frequency when cascaded. **20**

OR

12. a) Draw the circuit diagram of an emitter follower. Identify the type of feedback and comment on its gain, input and output resistances with feedback. **10**
    b) With neat circuit diagram, describe the working of RC phase shift oscillator. Draw the equivalent circuit and derive expression for its oscillation frequency. **10**

Module – II

13. a) Draw RC integrating circuit and prove that its $v_o \alpha \int v_i dt$. Sketch its output waveforms for
    i) sine wave
    ii) square wave and
    iii) triangular wave inputs. **10**
    b) Draw the circuit of a series pass voltage regulator with feedback and current limiting facility and explain its functioning. **10**

OR

14. a) Draw a Dual-power supply to generate $\pm$ 15 volt. Design the circuit and explain. **8**
    b) With an internal functional block diagram, explain the working of a 555 timer. Explain how can it be wired to produce 0 to 5 volt, 1 KHz symmetrical square waves. **12**

Module – III

15. a) Power qualitatively that the efficiency of class B power amplifier is much higher than that of class A. What is maximum power hyperbola ? Draw and explain. 12

    b) A transformer coupled class A power amplifier supplies the power to a 100 Ω load. Determine the maximum power output for a zero signal collector current of 80 mA if the transformer turns ratio is 10:1. 8

OR

16. a) Draw the circuit of an op-amp schmitt trigger for UTP = +8 volt, LTP = –3 volt. Design your circuit. 12

    b) With circuit diagram and appropriate waveforms describe the working of a precision full wave rectifier. 8

Module – IV

17. a) Explain the theory and working principle of two types of LCDs. Compare their performances and merits. 10

    b) Explain the working principle of a Laser diode and discuss its applications. 10

OR

18. Explain the construction, working and characteristics of N-channel and P- channel MOSFETs. Explain the channel length modulation. 20

(4×20=80 Marks)