



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 ?

**(10x2=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
- overall voltage gain
  - input resistance
  - lower cut off frequency and
  - 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  $v_o \propto \int v_i dt$ . Sketch its output waveforms for
- sine wave
  - square wave and
  - 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  $100 \Omega$  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)**

