G 568 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Fourth Semester

Branch : Electronics and Communication/Applied Electronics and Instrumentation/ Electronics and Instrumentation Engineering

ELECTRONIC CIRCUITS—II (LAS)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Explain which capacitance-emitter or collector junction capacitance affects the upper cut-off frequency of a CE amplifier critically ? Why ?
2. What is the trade-off between gain and bandwidth of an RC coupled amplifier ? Explain its figure of merit.
3. Draw the generalised block diagram of a feedback amplifier and identify each block. State their functions.
4. List the four properties - Z_i, Z_o, A_i, A_v of a Darlington pair amplifier.
5. In a transistorised Hartely oscillator, the two inductances are 2 mH and 20 μH while the frequency is to be changed from 630 kHz to 1050 kHz. Calculate the range over which the capacitor is to be varied ?
6. Draw the circuit diagram of a tuned collector oscillator and explain its working.
7. What are the differences between the astable and monostable multivibrator circuits and their applications.
8. What is meant by hysteresis voltage in a Schmitt trigger ? How it is measured ?
9. Mention a few applications of voltage and current time base circuits.
10. Why do you require a complementary-Symmetry amplifier in a power amplifier circuit.

(10 × 4 = 40 marks)

Turn over

Part B

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. Derive the *r*-parameter equivalent circuit for a CE transistor and deduce the relationship of the *r*-parameters with the *h*-parameters.

Or

12. Draw the circuit diagram of a double tuned CE amplifier and explain the working with the help of its frequency response curve. Discuss its applications.

13. With the help of necessary equations explain the effect of voltage series feedback in the following performance measures of a BJT amplifier (i) gain stability ; (ii) bandwidth ; (iii) distortion ; (iv) noise ; (v) input resistance ; and (vi) output resistance.

Or

14. With a neat emitter coupled difference amplifier circuit diagram, explain how the problem of drift is overcome ? Explain its difference and common mode operations ?

15. With a neat circuit diagram, explain how Barkhausen conditions are satisfied in a transistorised Wien bridge oscillator. Derive the expressions for its frequency of oscillation and amplifier gain.

Or

16. A crystal has L = 0.33 H, C_1 = 0. 065 pF, C_h = IPF and R = 5.5 KΩ. Find the series resonant frequency and Q factor of the circuit. Explain the operation of the circuit.

17. Draw the circuit of a Schmitt trigger and design it for the following specifications :

V_{cc} = 15V, UTP = 5V, I_{c_2} = 5 *mA*, LTP = 3V. Determine $R_1, R_2, R_E, R_{c_1}, R_{c_2}$ and R_B.

Or

18. With neat circuit diagram and necessary waveforms, explain how a BJT bistable multivibrator can be used as a frequency divider ?

19. Sketch the circuit of a class AB transformer coupled power amplifier and explain its working. With wavefo.ms explain the differences between the class B and class AB circuits.

Or

20. With a generalised block diagram, explain how constant current charging is obtained in a miller sweep configuration. With the BJT circuit and waveforms, explain how linear sweep is obtained in the Miller sweep generator.

(5 × 12 = 60 marks)