(6 pages) Reg. No. : _____

Code No. : 10304 E **Sub. Code : AMPH 51**

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fifth Semester

Physics — Core

BASIC ELECTRONICS

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Give condition justifies which network theorems : The load impedance should be complex conjugate of the internal impedance of the active network
   (a) Compensation theorem
   (b) Millman's theorem
   (c) Maximum power transfer theorem
   (d) Reciprocity theorem

2. What do you mean by h parameters?
   (a) Hyper parameters
   (b) Hybrid parameters
   (c) Linear parameters
   (d) All of the above

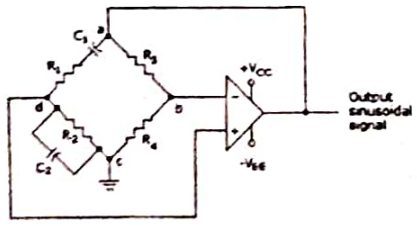
3. Zener diodes are also known as
   (a) Voltage regulators
   (b) Forward bias diode
   (c) Breakdown diode
   (d) None of the mentioned

4. In a full wave rectifier, the current in each diode flows for
   (a) Whole cycle of the input signal
   (b) Half cycle of the input signal
   (c) More than half cycle of the input signal
   (d) None of these

5. When the base region is common to both input and output circuits, the configuration is called ———?
   (a) Common Emitter
   (b) Common base
   (c) Common collector
   (d) Open circuit

6. The current ratio of a beta is ———?
   (a) IC/IE (b) IB/IC
   (c) IE/IB (d) IC/IB

7. Calculate the value of $C_1 = C_2$ for the Wien bridge oscillator to operate at a frequency of 20 kHz. Assume $R_1 = R_2 = 50\,k\Omega$ and $R_3 = 3R_4 = 600\,\Omega$?



   (a) 1.59 pF (b) 15.9 pF
   (c) 159 pF (d) 1.59 nF

8. A multivibrator is an electronic circuit used to implement ———
   (a) Oscillator (b) Timer
   (c) Flip-flop (d) All of the above

9. Operational amplifier has ——— outputs.
   (a) single (b) similar
   (c) multiple (d) differential

10. Operational amplifier output is represented as ———
    (a) Vin (b) Vout
    (c) V+ (d) V–

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) State and explain Norton's theorem.

    Or

    (b) Describe about the maximum power transfer theorem.

12. (a) Explain V-I characteristics of Zener diode.

    Or

    (b) Distinguish half wave rectifier and full wave rectifier.

13. (a) Analyze the common base amplifier using h-parameter.

    Or

    (b) Explain push pull amplifier.

14. (a) Explain the Hartley Oscillator and derive the equation for oscillator.

Or

(b) Write an essay on differentiating circuits.

15. (a) List out the characteristics of ideal operational amplifier.

Or

(b) Write a short note on non-inverting amplifier.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write an essay on Thevenins theorem.

Or

(b) Determine the h-parameters for equivalent circuit of a transistor.

17. (a) Describe about the full wave bridge rectifier.

Or

(b) Explain the working principle of tunnel diode.

18. (a) Summarize the working action of a transistor.

Or

(b) Write an essay on transformer coupled amplifier.

19. (a) Explain phase shift oscillator using transistor.

Or

(b) Give an account on astable multivibrator.

20. (a) Explain integrator.

Or

(b) Compare low pass and high pass filter.

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