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Reg. No. :

Code No. : 20037 E Sub. Code : CMPH 51

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Physics – Core

BASIC ELECTRONICS

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. An practical example of ideal voltage source is :
 - (a) Lead acid cell
 - (b) Dry cell
 - (c) Daniel cell
 - (d) None of the above

2. Maximum efficiency of power transfer is :
 - (a) 9.75%
 - (b) 25%
 - (c) 90%
 - (d) 50%
3. Crystal Diode is used as :
 - (a) amplifier
 - (b) rectifier
 - (c) oscillator
 - (d) voltage regulator
4. A Zener diode is always _____
 - (a) reverse bias
 - (b) forward connection bias
 - (c) either reverse or forward bias
 - (d) none of the above
5. Pushpull amplifier is operated mostly under :
 - (a) class A
 - (b) class B
 - (c) class C
 - (d) class D
6. FET is :
 - (a) a unipolar device
 - (b) bipolar device
 - (c) unijunction device
 - (d) all the above

7. In colpitt's oscillator, the feedback is :

- (a) inductive
- (b) capacitive
- (c) resistive
- (d) all the above

8. Barkhausen criterion for oscillation is :

- (a) $AB = 1$ (b) $AB > 1$
- (c) $AB < 1$ (d) $AB = -1$

9. CMRR of an operational amplifier is the ratio :

- (a) A_d / A_c (b) A_c / A_d
- (c) $A_d - A_c$ (d) $A_c - A_d$

10. The operational amplifier can amplify _____

- (a) ac signals only
- (b) dc signals only
- (c) both ac and dc signals
- (d) none of the above

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain : Norton's theorem.

Or

(b) Compare : Thevenin's and Norton's theorem.

12. (a) Write a short note on : Advantages and limitations of full wave rectifier.

Or

(b) Explain the action of zener diode.

13. (a) Compare : α, β, γ .

Or

(b) Compare voltage amplifier and power amplifier.

14. (a) State the principle and draw a diagram of Hartley oscillator.

Or

(b) State the principle and draw a diagram of colpitt's oscillator.

15. (a) Write a short note on : Adder circuits.

Or

(b) Explain the term : voltage.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Define : Ohm's law. State and explain thevenin's theorem.

Or

(b) Define the following : (i) Electric currents (ii) Electric power (iii) Active devices (iv) passive devices (v) h-parameters of a transistor.

17. (a) Sketch and explain the forward and reverse characteristics of the diode.

Or

(b) Describe the action of the following filter circuits (i) capacitor filter (ii) choke input filter (iii) capacitor input filter.

18. (a) Explain the actions of JFET an amplifier.

Or

(b) Describe the working and salient features of transistor audio power amplifier.

19. (a) Discuss the working of Schmitt trigger using transistor.

Or

(b) Explain the actions of bistable multivibrator.

20. (a) Describe the action of the following :

(i) Adder

(ii) Subtractor using OP amp.

Or

(b) Describe the functions of inverting operational amplifier.