

(6 pages)

Reg. No. :

Code No. : 20298 E Sub. Code : CMPH 51

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 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 — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. The unit of output admittance of two-port network is

- (a) ohm (b) henry
(c) ampere (d) mho

2. Thevenin's theorem can be applied to

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

3. The depletion region in a p-n junction diode is formed due to

- (a) doping (b) barrier potential
(c) bound ions (d) biasing

4. The knee voltage of a diode is approximately equal to

- (a) applied voltage (b) barrier potential
(c) breakdown voltage (d) forward voltage

5. Pushpull amplifier is operated mostly under

- (a) Class A (b) Class B
(c) Class C (d) Class D

6. In a CE transistor amplifier, voltage gain is

- (a) $\alpha \cdot R/R_L$ (b) $\beta \cdot R/R_L$
(c) $(1 + \alpha) \cdot R/R_L$ (d) $(1 + \beta) \cdot R/R_L$

7. An oscillator is an amplifier with
 (a) positive feedback (b) negative feedback
 (c) neither (a) nor (b) (d) RC network
8. Barkhausen criterion for oscillation is
 (a) $A\beta = 1$ (b) $A\beta > 1$
 (c) $A\beta < 1$ (d) $A\beta = -1$
9. An ideal operational amplifier has
 (a) infinite voltage gain
 (b) infinite input impedance
 (c) zero input impedance
 (d) all the above
10. CMRR of an operational amplifier is the ratio
 (a) A_d / A_c (b) A_c / A_d
 (c) $A_d - A_c$ (d) $A_c - A_d$

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write a short note on : Constant/ideal voltage.
 Or
 (b) Explain : Norton's theorem.

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12. (a) Explain the functions of p-n junction diode.
 Or
 (b) Write down the principle and uses of tunnel diode.
13. (a) Write a short note on : Bipolar junction.
 Or
 (b) Compare : Voltage amplifier and power amplifier.
14. (a) Explain the types of feedback of an amplifier.
 Or
 (b) State the principle and draw a diagram of Hartley oscillator.
15. (a) Define : Amplifier. Explain the types of amplifier.
 Or
 (b) Write a short note on : Slew rate.

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) Differentiate : Thevenin's theorem and Norton's theorem.

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 [P.T.O.]

17. (a) Describe with suitable graphs, the action of p-n diode.
(i) Forward bias
(ii) Reverse bias.

Or

- (b) Explain the action of a zener diode as voltage regulator.
18. (a) Discuss the action of common emitter transistor amplifier.

Or

- (b) Describe the construction, working and advantages of pushpull amplifier.
19. (a) Explain the principle of negative feedback in an amplifier. Derive an expression for voltage gain with negative feedback.

Or

- (b) Describe the applications of :
(i) Astable multivibrator
(ii) Monostable multivibrator
(iii) Bistable multivibrator.

20. (a) Write a short note on :
(i) Differential amplifier
(ii) Operational amplifier.

Or

- (b) Describe the action of the following :
(i) Adder
(ii) Subtractor using op-amp
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