

110237

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Name.....

Reg. No.....

**FIFTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2024**

Physics/Applied Physics

PHY 5B 09/APH 5B 09—ELECTRONICS (ANALOG AND DIGITAL)

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer all questions in two or three sentences,
each correct answer carries a maximum of 2 marks.*

1. What is the main advantage of a bridge rectifier over a half-wave rectifier ?
2. Construct AND, OR and NOT gates using NOR gates.
3. Draw the dc and ac equivalent circuit of a CE transistor amplifier.
4. The voltage gain of an amplifier without feedback is 2500. If a negative feedback fraction of 0.01 is applied, find the voltage gain of the amplifier.
5. What is a voltage doubler ?
6. What is the formula for power gain of a CE amplifier ?
7. Convert the binary no 1001110 to Octal and hexadecimal base
8. How do you obtain the 2's complement of a binary number ?
9. Simplify the expression : $A \cdot (B + B')$.
10. How does the voltage gain of a CE amplifier compare to a CB amplifier ?
1. Draw the circuit of the differentiator using an op amp.
2. What is an exclusive or gate ? How would you realise it using Nand gates ?

(Ceiling - 20 marks)

Turn over

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Section B

Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks

13. Define the efficiency of a Full wave rectifier and explain how it is calculated.
14. Discuss the methods used to reduce ripple in the output of a rectifier.
15. Compare the characteristics of the Common Base, Common Emitter, and Common Collector configurations
16. With a neat diagram explain the voltage divider bias for a transistor.
17. Simplify the following Boolean Expressions :

a) $\overline{A\overline{B}} \cdot (\overline{A} + B)$; and

b) $\overline{ABC + BC}$.

18. Explain the working of a JK Flip-Flop with a neat diagram.
19. Draw the circuit diagram of a full adder using only NOR gates and obtain the truth table.

(Cells)

Section C (Essays)

Answer in about two pages, any one question.

Answer carries 10 marks.

20. With a neat Diagram explain the saturation and cut off for a CE amplifier. Derive the expressions for its voltage gain, current gain and power gain.
21. What is the frequency of Oscillation for the following oscillators.
 - i) Colpitt's Oscillator.
 - ii) Phase Shift Oscillator.

With a neat diagram explain the working of each of them.

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