23U511 (Pages: 2) Name: .....

Reg.No: .....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19UPHY5B09 / CC20UPHY5B09 - ELECTRONICS (ANALOG AND DIGITAL)

(Physics - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. What are the advantages of a full wave rectifier?
2. Show that a rectified output contains both AC and DC.
3. Derive the relation between α and β.
4. What is thermal run away?
5. Draw a single stage transistor amplifier.
6. What is Barkhausen criterion?
7. What is meant by input offset voltage and input bias current?
8. An op-amp can be used as an integrator. Explain.
9. (i) Add 1100 and 1101 in binary.
   (ii) Subtract 111 from 11001 in binary.
10. What are basic gates?
11. Give the symbols, diagram and truth tables of full adder.
12. What are the uses of a flip-flop?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. Explain the construction and working of a voltage doubler.
14. A zener diode is connected with a series resistance of 11kΩ and load resistance of 3.3kΩ. If the input voltage is 100V and zener voltage is 40V find (i) output voltage and (ii) the current through the zener diode.

15. Compare the advantages and disadvantages of RC coupling, transformer coupling and direct coupling.

16. The voltage gain of an amplifer without feedback is 3000. Calculate the voltage gain of the amplifier if negative feedback is introduced in the circuit. Given that feedback fraction is 0.1.

17. In the phase shift oscillator, $R_1 = R_2 = R_3 = 1$ Mega ohm and $C_1 = C_2 = C_3 = 68$pF. At what frequency does the circuit oscillate?

18. Convert (1) 72.16 into binary (2) 11101101 to hexadecimal.

19. State and explain DeMorgans theorem.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

20. Discuss the A.C. and D.C load lines of a transistor in CE configuration. How operating point is determined from the load lines?

21. Discuss the construction and working of a RC coupled amplifier. Discuss its frequency response, advantages and disadvantages and applications.

(1 × 10 = 10 Marks)

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