FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY5 B09 / CC20U PHY5 B09 - ELECTRONICS (ANALOG AND DIGITAL)

(Physics - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 3

Part A

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

1. What are the advantages of a full wave rectifier?

2. What is a capacitor input filter?

3. What is meant by dc loadline of a transistor? What is its importance?

4. What is thermal runaway?

5. Draw a single stage transistor amplifier.

6. Explain: (i) Decibel gain (ii) Bandwidth

7. What is feedback fraction? How is it connected to closed loop gain?

8. An op-amp can be used as an integrator. Explain.

9. Find the decimal value for the binary number 1010.

10. Subtract 5 from 7 using two's complement method in 8 bit format.

11. What is the function of half-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. 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.

16. A 1pF capacitor is available. Calculate the inductor values in a Hartley oscillator so that f=1MHz and m_v=0.2.

17. What are the characteristics of an Ideal OPAMP?

18. Explain the working of fundamental gates with truth table.

19. State and prove DeMorgan's theorem.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Discuss the characteristics of three transistor configurations with neat diagrams.

21. Discuss the construction and working of a direct coupled amplifier. Discuss its advantages and disadvantages and applications.

(1 × 10 = 10 Marks)

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