

22U515

(Pages: 2)

Name: .....

Reg.No: .....

**FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024**

(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** (Short answer questions)

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

1. What is the function of a filter circuit?
2. What is a voltage multiplier?
3. What is the meaning of Q-point regarding biasing of an amplifier?
4. What is stability factor?
5. What are the disadvantages of RC coupled amplifier?
6. Draw the circuit diagram of transformer coupled amplifier.
7. What are the effects of negative feedback on the amplifier output?
8. Obtain the expression for feedback fraction of a Colpitts Oscillator.
9. Find the octal representation of the binary number 11110000.
10. What are basic gates?
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. A full wave bridge rectifier is connected to a step down transformer of 24V. Find the efficiency and dc load current if each diode has a resistance  $2\Omega$  and load resistance  $2k\Omega$ .
14. A zener diode of zener voltage 10 V is to be used as a voltage regulator. A series resistor of  $2K\Omega$  is used as a series resistor. Calculate the minimum value of load resistance to ensure that the Zener diode is in the ON state and the diode can be replaced by its  $V_z$  source equivalent, for an input voltage of 25V.
15. Explain the working of single stage transistor amplifier.

16. The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with  $L_1 = 58.6\mu\text{H}$  and  $C_1 = 300\text{pF}$ . Calculate frequency of oscillation.
17. Find the output voltage for an input voltage of (i) 0.5V (ii) -0.25V for the non-inverting amplifier. Given feedback resistance =  $18\text{K}\Omega$  and input resistance =  $2\text{K}\Omega$ .
18. What is binary number system? What are its advantages?
19. For the input combinations: 0010, 1010, 1100, 1011, the outputs are high. All other outputs are zero. Write the simplified Boolean equation and draw the logic circuit.

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

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

20. Discuss the characteristics of CB and CE transistor configurations with neat diagrams.
21. Discuss the working of a differential amplifier.

**(1 × 10 = 10 Marks)**

\*\*\*\*\*