K21U 4562

V Semester B.Sc. Degree CBCSS (OBE) Regular Examination, November 2021
(2019 Admn. Only)
CORE COURSE IN PHYSICS
5B09PHY : Electronics – II

Time : 3 Hours

Max. Marks : 40

SECTION – A

(Very short answer type. Answer **all** questions. **Each** question carries **1** mark.)

1. What do you mean by operating point ?

2. The purpose of a coupling capacitor in transistor amplifier is

3. Write down the expression for frequency of Colpitt's Oscillator.

4. The inputs to an XOR Gate is 1 and 1. What is its output ?

5. A differential amplifier has a common mode gain of 0.3 and a differential voltage gain of 3000. Determine CMRR.

6. An inverting amplifier has R_i = 10 KΩ and R_f = 100 KΩ. The closed loop voltage gain is

(6×1=6)

SECTION – B

(Short essay type. Answer **any 6** questions. **Each** question carries **2** marks.)

7. Explain De Morgan's theorem with an example.

8. Differentiate open loop and closed loop voltage gain.

9. Explain the working of an inverting amplifier.

10. Write a short note on hybrid parameters and their dimensions.

11. What is a Phase shift oscillator ? Draw the circuit and obtain the expression for frequency.

12. Express power gain and voltage gain in decibel unit. What is the importance of expressing gain in decibel unit ?

13. Explain the following terms :
    1) Frequency Response
    2) Band width.

14. Illustrate Sum of Products method with an example.

(6×2=12)

SECTION – C

(Problem type. Answer **any 4** questions. **Each** question carries **3 marks.**)

15. Obtain an expression for the closed loop voltage gain of a non-inverting amplifier.

16. Calculate the operating frequency and feedback fraction of Hartley oscillator. Given $L_1 = 1$ mH, $L_2 = 0.1$ mH, $C = 20$ pF. The mutual inductance between coils is 0.02 mH. Calculate the feedback fraction.

17. Draw a full adder circuit. Obtain the expression for sum and carry.

18. For a single stage CE transistor amplifier circuit $R_1 = 10$ KΩ, $R_2 = 5$ KΩ, $R_C = 1$ KΩ, $R_E = 2$ KΩ, $R_L = 1$ KΩ, $V_{BE} = 0.7$ V and $V_{CC} = 15$ V.
    1) Draw the dc load line.
    2) Determine the operating point.
    3) Draw the ac load line.

19. Simplify the Boolean expression $X = AB + A(B + C) + B(B + C)$.

20. Convert the SOP expression $X = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}C + ABC$ to POS. **(4×3=12)**

SECTION – D

(Long essay type. Answer **any 2** questions. **Each** question carries **5 marks.**)

21. Draw the circuit of a single stage common emitter transistor amplifier. Explain the functions of all components and show that output is 180° out of phase with the input.

22. What is a power amplifier ? Compare Class A, Class B and Class C amplifiers.

23. Explain the working of an integrator and a differentiator circuit using Op-amp.

24. Briefly explain the working of comparator, decoder and encoder circuits. **(2×5=10)**

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