ST. FRANCIS DE SALES COLLEGE
A FRANSALIAN INSTITUTE OF HIGHER EDUCATION AUTONOMOUS

NAAC A GRADE ● AFFILIATED TO BANGALORE UNIVERSITY ● AICTE APPROVED ● 2(F) & 12 (B) RECOGNITION OF UGC ● ISO 9001 2015 CERTIFIED

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END SEMESTER EXAMINATION –DECEMBER 2024

ELECTRONICS – I SEMESTER BSC

24BSC15A: ANALOG AND DIGITAL ELECTRONICS I

Time: 3 Hours   **Max. Marks: 80**

Instruction: *Answers should be written completely in English*

PART- A

Answer any **TEN** questions. Each question carries **TWO** Marks.   **(10X2=20)**

1. Differentiate between active and passive components.
2. State Maximum power transfer theorem.
3. Give example for fixed and variable IC voltage Regulator.
4. Which region in a bipolar junction transistor is wider and which region is thinner?
5. What is stability factor?
6. Give any two advantages of CE amplifier.
7. What do you mean by thermal runaway?
8. Mention the radix of Decimal, Binary, Hexadecimal Number System
9. What is an exclusive OR gate? Write its truth table.
10. State De morgan's Theorem.
11. How is positive logic different from negative logic?
12. Draw the block diagram of 4:1multiplexer.
13. Draw the truth table of full adder.

PART – B

Answer any **FIVE** questions. Each question carries **EIGHT** Marks.   **(5X8=40)**

14. Explain the working of a half wave rectifier and write the expressions for output voltage, ripple factor and efficiency.   8
15. Explain the working of a Zener diode as a line and load regulator.   8
16. Explain the characteristics of transistor in CE mode.   8
17. Explain the construction and working of a two stage RC coupled amplifier. Plot its frequency response.   8
18. a) Explain with an example, the conversion of decimal to hexadecimal number   6
    b) What do you mean by Gray code?   2
19. Realize AND, OR, NOT and NOR gates using only NAND gates.   8
20. Explain half adder and half subtractor using logical diagram and truth table   8

21. Design
    a) 1:4 Demultiplexer.   4
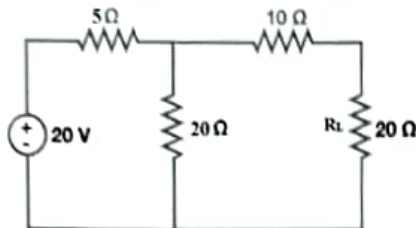   b) 2 -bit Magnitude Comparator.   4

PART C

Answer any **FOUR** questions. Each question carries **FIVE** Marks.   (4X5=20)

22. For the given circuit, find:
    a) Thevenin's voltage –V_{th} b) Thevenin's resistance-R_{th} c) Current through R_L

23. An AC supply of 230V ,50Hz is applied to a full wave bridge rectifier through a
    transformer of turns ratio 8:1. Assume the diodes to be ideal. For a load resistance
    RL=150 Ω. Find a) DC output voltage   b) average output Current

24. A common emitter amplifier has a voltage gain of 50, an input impedance of 100Ω and an
    output impedance of 200Ω. Calculate the power gain of the amplifier

25. A transistor is connected in common base configuration with α = 0.95, I_E = 1mA.
    Calculate the values of a) I_C b) I_B c) β   d) γ

26. Reduce the given Boolean expression using 4 variable k-map.
    F(A, B,C,D)=$\sum$m(0,1,2,5,8,10,11,13,14,15)

27. Construct 2:4 decoder using NAND gates.