



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

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Electronics City P.O., Bengaluru - 560 100, Karnataka, INDIA ☎ (+91) 8088140679 ✉ pro@sfscollege.in 🌐 www.sfscollege.in

END SEMESTER EXAMINATION – NOV/DEC 2025

ELECTRONICS – I SEMESTER BSC (Repeaters)

24BSC15A: ANALOG AND DIGITAL ELECTRONICS I

Time: 3 Hours

Max. Marks:80

Instruction: *Answer should be written completely in English.*

SECTION– A

Answer any **TEN** questions. Each question carries **TWO** marks.

(10X2= 20)

1. What do you mean by passive components? Give example.
2. Define KCL and KVL.
3. Define voltage divider theorem.
4. Define the time constant of an RC discharging circuit.
5. Draw the Symbol of a Varactor Diode. Also give any one application
6. What do you mean by rectification?
7. What are the types of Bipolar Junction Transistors?
8. What are the different types of number systems used in digital electronics?
9. Write the rules for binary addition and subtraction.
10. Write any two basic Boolean laws.
11. What do you mean by logic gates? Give example.
12. What is a Half Adder?
13. What is a multiplexer?

SECTION– B

Answer any **FIVE** questions. Each question carries **EIGHT** marks.

(5X8=40)

14. Explain the construction, working, and VI characteristics of a PN junction diode.
15. Explain the working of a Full-Wave Bridge Rectifier and write the equation for output voltage, efficiency, and ripple factor.
16. With a block diagram explain the functioning of a power supply.
17. With a diagram explain the working of NPN transistor.
18. Classify the binary codes with example.
19. Explain the basic logic gates, derived gates and universal gates with symbols, Boolean expressions, and truth tables.
20. Explain the working of a Half Adder and Full Adder with circuit diagram, truth table and Boolean expressions.
21. Explain in detail about 4-1 Multiplexer circuit.



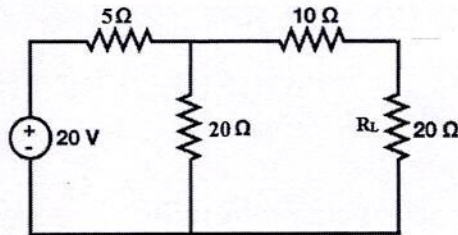
SECTION-C

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. A series RLC circuit has a sinusoidal input voltage of maximum value 12V. If inductance $L=10\text{mH}$, $C=20\mu\text{F}$ and $R=60\Omega$. Calculate a) Resonant Frequency
b) Quality factor.
24. A transistor is connected in common base configurations $\alpha=0.95$, $I_E=1\text{mA}$. Calculate the values of a) Collector Current
b) Base current c) β d) γ .
25. Convert
i) Decimal 165 to binary.
ii) 1001011 to decimal.
iii) AF45 to binary.
26. Find i) 2's complement of $(011011)_2$ ii) Add 1011 with 0101.
27. Implement the Universal property of NAND Gate.
28. Simplify the Boolean expression using K-Map $F(A,B,C,D)=\sum m(1,3,4,5,6,7,9,11,12,13)$.

