

BACHELOR OF SCIENCE (CBCS-2018 COURSE)

S. Y. B. Sc. Sem-IV :SUMMER- 2022

SUBJECT : PHYSICS : ELECTRONICS

Day : Monday
Date : 4/7/2022

S-18378-2022

Time : 03:00 PM-06:00 PM
Max. Marks : 60

N.B.

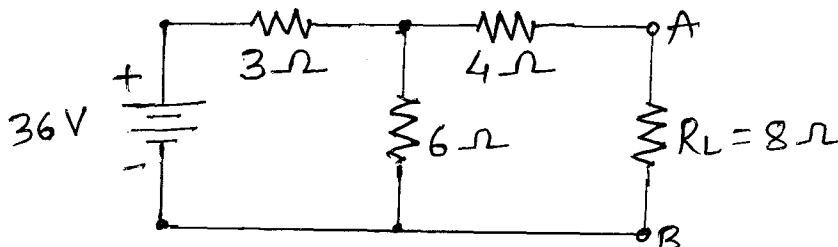
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagrams **WHEREVER** necessary.
- 4) Use of **SCIENTIFIC** calculator is allowed.

Q.1 Answer **ANY TWO** of the following: (12)

- a) With neat diagram explain the input and output characteristic curve for transistor in CE-mode.
- b) State the different biasing methods for transistor. Explain any one in detail.
- c) Give the symbols, truth table and Boolean equations for the following gates:
i) NOR ii) NAND iii) EX-NOR

Q.2 Answer **ANY TWO** of the following: (12)

- a) Explain the action of NPN transistor with necessary diagram.
- b) Explain the construction and working of UJT.
- c) i) Give the statement of Thevenin's theorem.
ii) Using Thevenin's theorem, determine the current flowing through R_L of the network given below.



Q.3 Answer **ANY TWO** of the following: (12)

- a) Draw well labelled diagram for RC coupled CE-amplifier. Explain it in brief.
- b) Explain RS Flip-Flop using NAND gates with diagram and truth table.
- c) Explain the working principle of Switch Mode Power Supply with necessary diagram.

Q.4 Answer **ANY THREE** of the following: (12)

- a) With necessary diagram explain the working of full wave rectifier.
- b) In a CE transistor amplifier the R_C in the collector circuit is $4\text{ k}\Omega$ and $V_{CC} = 12\text{ V}$. Find the co-ordinates of the operating point if the zero signal base current is $20\text{ }\mu\text{A}$ and $\beta = 100$.
- c) Give the statement of :
i) Maximum Power Transfer theorem
ii) Superposition theorem
- d) Give the Barkhausen criteria for sustained oscillations.

Q.5 Answer **ANY FOUR** of the following: (12)

- a) Perform the following conversions:
i) $(9AF)_{16} = (?)_{10}$ ii) $(2598)_{10} = (?)_{16}$
iii) $(237)_{10} = (?)_{BCD}$

(PTO)

b) Simplify the following expressions:

i) $\overline{(\overline{A.B})(B.C)(C.D)}$

ii) $\overline{AB + A + AB}$

c) Verify De-Morgan's first theorem.

d) i) Define intrinsic stand off ratio for UJT.

ii) The intrinsic stand off ratio for UJT is 0.6. If interbase resistance is $5k\Omega$, calculate the values of R_{B1} and R_{B2} .

e) Define feedback. State and explain its types.

f) Using 2's complement method subtract $(01101)_2$ from $(11011)_2$

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