S.Y.B.SC. SEM – IV (CBCS - 2016 Course) : SUMMER - 2019
SUBJECT : PHYSICS : ELECTRONICS

Day : **Saturday** Time : 11.00 A.M. To 02.00 P.M.
Date : **20/04/2019** **S-2019-0846** Max. Marks : 60

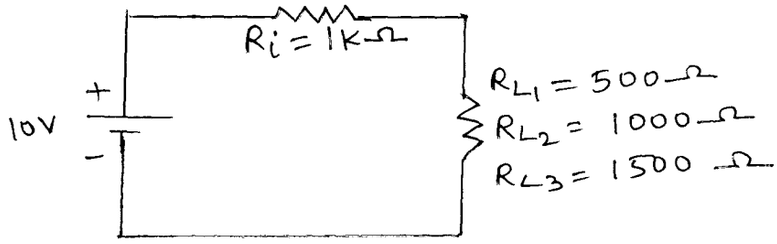
N. B. :
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of **SCIENTIFIC** calculator is allowed.

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

a) Explain the action of RS- Flip-flop with diagram and truth table.
b) Explain the Barkhausen criteria for sustained oscillations.
c) With necessary diagram explain the output characteristics of transistor in CE-mode.

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

a) **i)** Give the statement for Maximum power Transfer theorem.
ii) Verify maximum power transfer theorem for the following circuit.



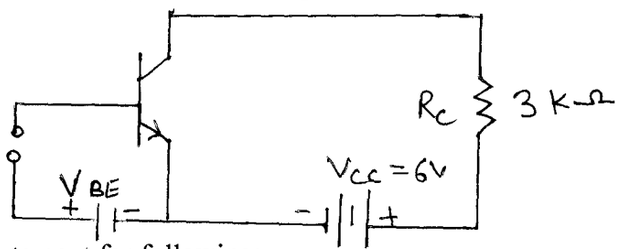
b) Convert the following:
i) $(64)_{10} = (?)_8$ **ii)** $(76)_{10} = (?)_{16}$ **iii)** $(4BAC)_{16} = (?)_2$
c) Explain the action of SMPS with duty cycle.

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

a) Draw symbols for UJT and explain its I-V characteristics.
b) With neat diagram explain the action of full wave rectifier with necessary diagram.
c) Explain the action of RC coupled amplifier with necessary diagram.

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

a) In the following circuit diagram if V_{cc} = 6V and R_c = 3k Ω, draw d.c. load line. What will be Q- point if zero signal base current is 20 μA and β = 50?



b) Give the statement for following:
i) Thevenin's theorem **ii)** Nortan's theorem
c) Explain the following gates with symbol, Boolean expression and truth table
i) AND **ii)** EXOR
d) Explain the action of transistor as a switch.

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

a) State any three Boolean laws.
b) Explain the three pin regulator IC 7905.
c) State and explain De-Morgans second theorem.
d) **i)** Using 1's complement method, subtract $(01101)_2$ from $(11011)_2$
ii) Using 2's complement method, subtract $(101)_2$ from $(111)_2$
e) Define the following: **i)** load regulation **ii)** Line regulation
f) Find α, I_B and I_E. Given I_C = 10 mA and β = 200

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