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EC–1848

B. Tech. (First Semester)

EXAMINATION, 2019

ELECTRONICS ENGINEERING

Time : Three Hours

Maximum Marks : 100

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

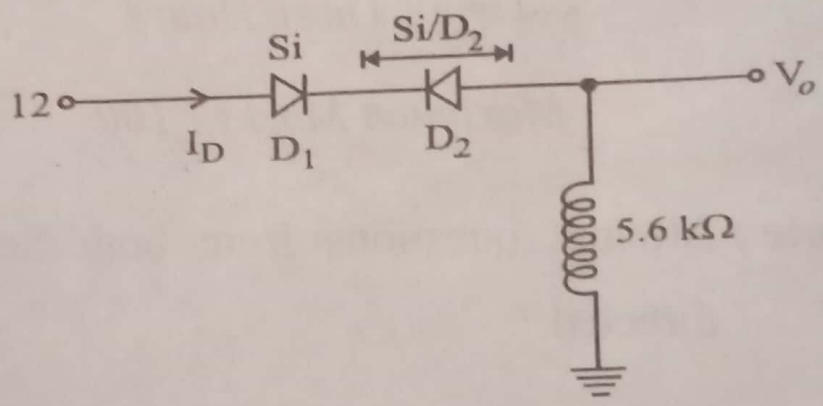
Note : Attempt any *ten* questions. Each question carries 4 marks. 10×4=40

1. Explain doping process in semiconductor. How will you make N-type and P-type semiconductor.

2. Describe the static and dynamic resistance of diode.

3. Find the piecewise linear equivalent circuit for the diode.

4. Determine I_D, V_{D_2} and V_o for the circuit given below :



5. Develope the relationship between α and β.

6. Find out the expression for ripple factor.

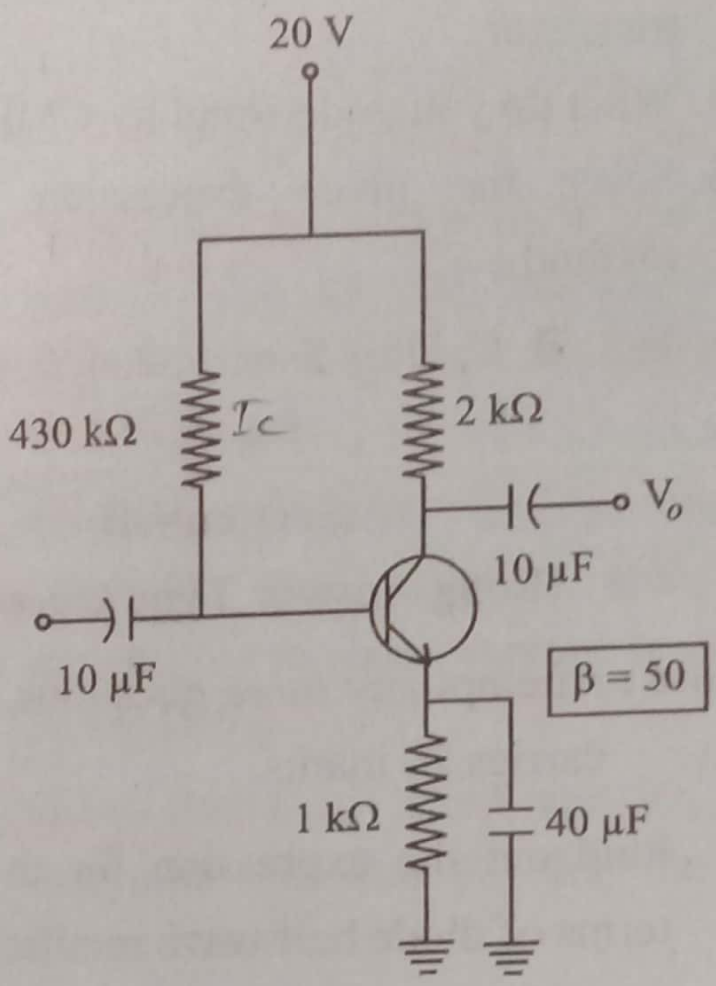
7. For a emitter bias network shown in figure given ahead determine :

   (a) I_B, I_C

   (b) V_{CE}

   (c) V_C

   (d) V_E



8. What do you understand by Pinch-off condition of FET ?
9. Explain the voltage follower and unit gain configuration of Op-Amp.
10. Convert the decimal number 53.625 into equivalent binary number.
11. Prove that :
    (i) $A + BC = (A + B)(A + C)$
    (ii) $A.(A + B) = A$
12. Explain the concept of Virtual ground.

13. Explain the significance of Q-point in transistor.
14. What do you understand by CMRR ?
15. Solve the given expression using K-map method :

$F(A, B, C, D) = \Sigma\, m\,(0, 2, 4, 5, 6, 7, 8, 10, 11, 12, 14, 15)$

Section—B

(Long Answer Type Questions)

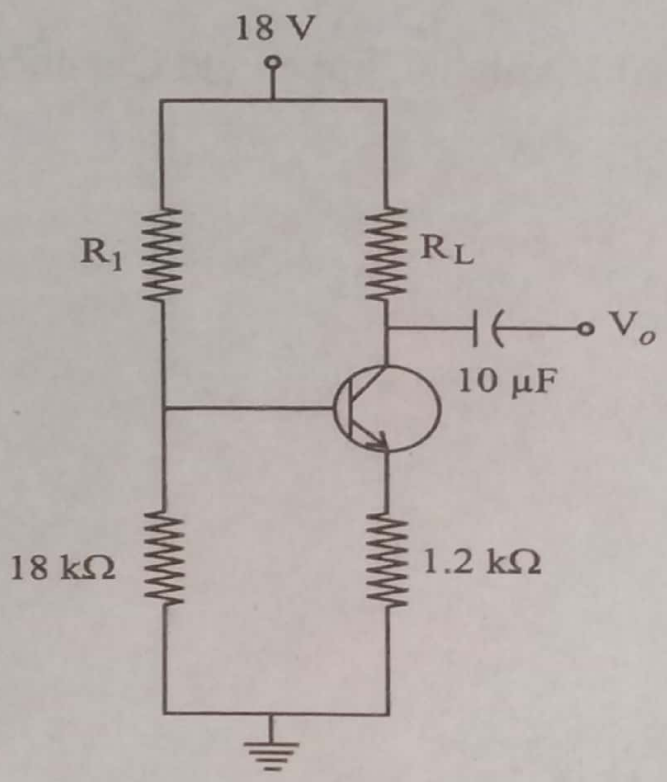
Note : Attempt any *three* questions. Each question carries 20 marks. $3 \times 20 = 60$

1. Find out the expression for the following in terms of diode half wave rectifier :
   (i) Average DC current Id
   (ii) R.M.S value of current Irms
   (iii) Input and output power
   (iv) Efficiency of rectifier
2. Explain the construction and working of Enhancement type MOSFET. Also give its merits, demerits and applications.
3. (a) Explain the working principle of digital voltmeter.

(b) What do you understand by Universal gate ? Give its truth table also with the help of universal gate realize AND, OR and NOT gate.

4. (a) Explain potential divider biasing of transistor with diagram and find out expression for base current I_b and output voltage V_{CE}.

(b) Given that $I_{CQ} = 2$ mA and $V_{CEQ} = 10$ V determine R_1 and R_C for the network shown below :



5. (a) Explain with diagram adder and integrator circuit of an Op-Amp.

(b) With the help of block diagram explain working of CRO.

6. (a) What do you understand by Minimization technique ? Solve the following using K-map :

(i) f (A, B, C, D) = Σm (7, 9, 10, 11, 12, 13, 14, 15)

(ii) f (A, B, C, D) =

$$m_1 + m_5 + m_{10} + m_{11} + m_{12} + m_{13} + m_{15}$$

(b) Explain Clipper and Clamber circuit.