[No. of Printed Pages – 4]

ES201
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Enrol. No. .....

SUPPLEMENTARY EXAMINATION : JUNE–JULY, 2019

BASIC ELECTRONICS ENGINEERING

Time : 3 Hrs. *Maximum Marks : 70*

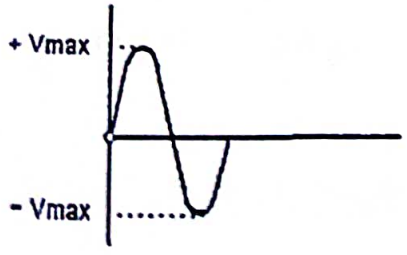
Note: ***Attempt questions from all sections as directed. Use of Simple calculator is allowed.***

SECTION – A (30 Marks)

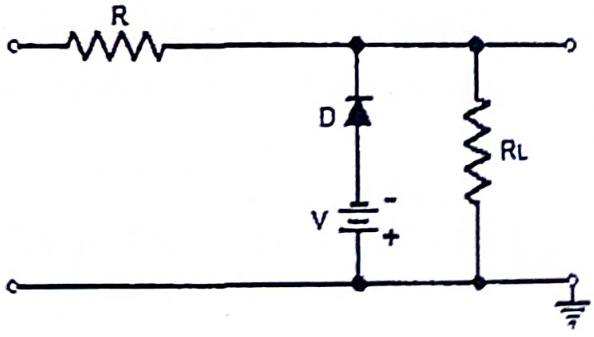
Attempt any **five** *questions out of* **six.**
Each question carries **06** *marks.*

1. Explain the working principal of Schottky diode and discuss how Schottky diode helps in reducing storage time.

2. (a) Draw the output across R_L of given clipper circuit. (3)



INPUT WAVEFORM



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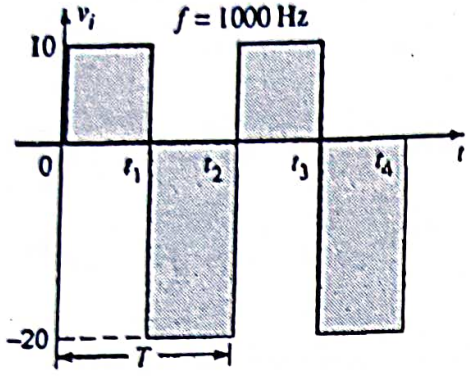
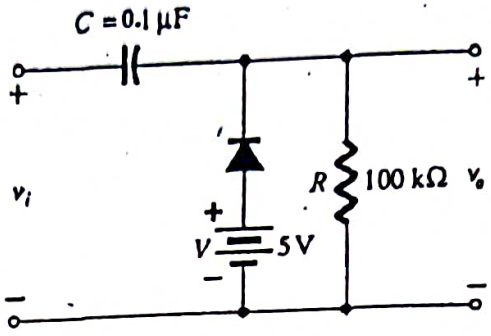
(b) Draw the output of given clamper circuit, assume germanium diode. (3)





3. (a) What is gray code? Give the advantage of gray code over binary code. (2)

(b) Design and implement full subtractor using only NAND gates. (4)

4. Define the CMRR for a differential amplifier. What is its ideal value? A differential amplifier has a common-mode gain of 0.2 and a common-mode rejection ratio of 3250. What would be the output voltage if the single-ended input voltage is 7 mV rms?

5. Simplify the following function using K-Map and implement simplified function using only NOR gates:

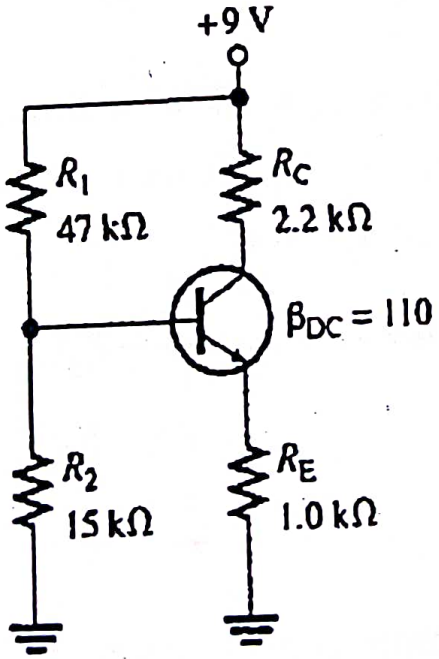
$$F(A, B, C, D) = \Pi(0, 2, 3, 4, 6, 12) + d\ (8, 10, 11, 14)$$

6. Define I_{CBO} and I_{CEO}. How are they related? Taking the example of common emitter amplifier, explain the criterion for selection of suitable operating point and factors affecting its stability.

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. Give reasons for the wide use of 'voltage divider bias' in BJT amplifiers. Determine the Q-point for the given network and construct dc load line for this transistor.



8. Determine Zi, Zo, and Av for the given network.

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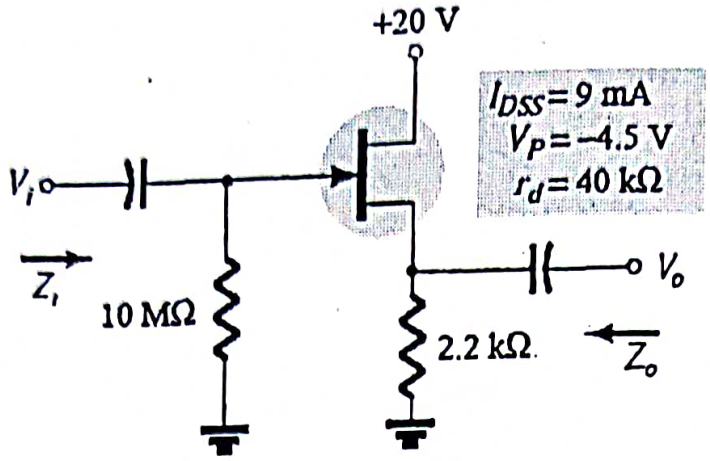
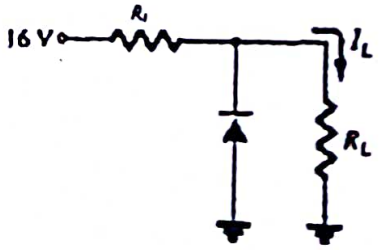


9. Discuss the characteristics of practical OP-AMP. Draw the circuit diagram of closed loop non-inverting operational amplifier and derive the expression for its output voltage.

SECTION – C (20 Marks)

(Compulsory)

10. (a) For the given network to maintain V_L at 12 V for a load variation (I_L) from 0 to 200 mA. Calculate the value of Rs and V_Z. (10)



(b) Give a comparison between JFET and MOSFET. Draw the circuit diagram for a common source JFET amplifier and derive the expressions for its voltage gain, output resistance in terms of FET parameters. (10)

[No. of Printed Pages – 4]

ES103 Enrol. No. .....

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Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **five** *questions out of* **six.**
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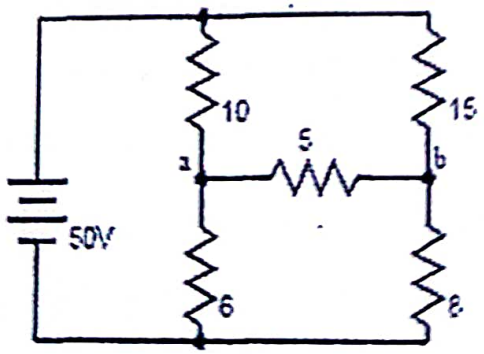
1. Define the following terms :

   (a) Q-Factor (2)

   (b) Form factor and Peak factor (2)

   (c) RMS values of alternating current (2)

2. Determine the equivalent thevenin's voltage between terminals 'a' and 'b' in the circuit shown below.



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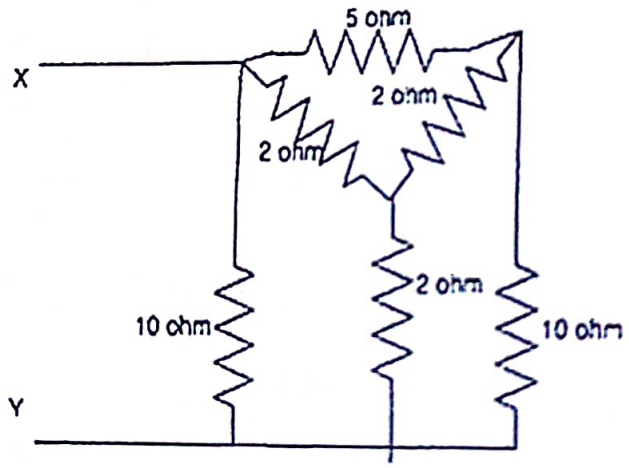
3. Explain how power is measured in 3-phase circuits by two wattmeter method?

4. A three phase, balanced delta connected load of (4+j8) Ω is connected across a 400V, 3-Ø balanced supply. Determine the phase current I_R. Assume the phase sequence to be R_{YB} Also determine phase current I_Y and phase current I_B.

5. Find the equivalent resistance between X and Y.



6. A balance load of (16+j12)Ω per phase, connected in star, is fed from a threephase, 230V supply. Find the line current, power factor, total power, reactive VA and total VA.

SECTION – B (20 Marks)

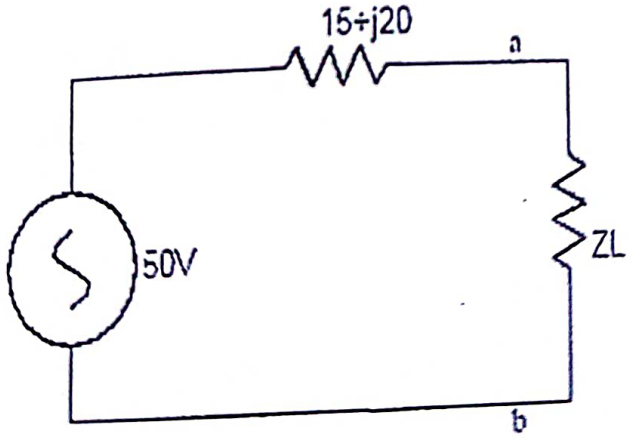
Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. (a) Derive the EMF equation of single phase Transformer. (5)

(b) What is the role of controlling torque in measuring instruments? Discuss. (5)

8. Explain construction and working of moving iron type voltmeter and ammeter.

9. (a) In the circuit shown, find the value of load impedance for which source delivers maximum power. Also find efficiency. (5)



(b) In the circuit shown, find the current through 3Ω resistor using Superposition theorem. (5)

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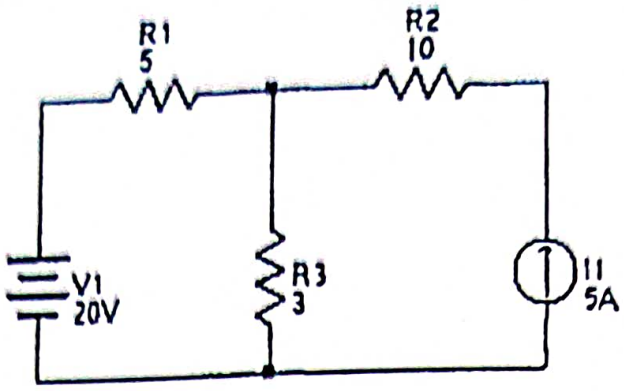

SECTION – C (20 Marks)

(Compulsory)

10. (a) Describe the construction and principle of Operation of DC generator. (10)

(b) For a star connected system in 3-phase circuit prove $V_L = \sqrt{3}v_{PH}$ and $I_L = I_{PH}$. A 3-phase, 400 V supply is connected to a 3-phase star connected balance load. The line current is 20A and power consumed by the load is 12 KW. Calculate the impedence of the load, phase current and power Factor. (10)