BENNETT UNIVERSITY
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Name of Student ---------- Enrolment No. ----------

Department / School ----------

BENNETT UNIVERSITY, GREATER NOIDA

Supplementary Examination, Fall SEMESTER 2019-20

COURSE CODE: EECE105L MAX. DURATION: **3 Hours**

COURSE NAME: Fundamentals of Electrical and Electronics Engg. MAX. MARKS: **100**

Note : Attempt all the questions. Each question carries 10 marks.

Q.1 For the circuit shown in Fig. 1, determine current through the resistors, voltage across the resistors and their power rating.

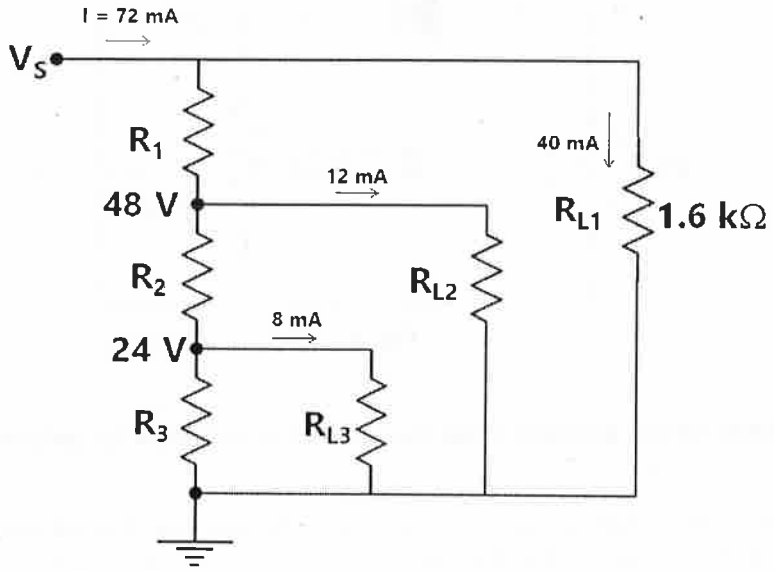

Fig. 1

Q.2 (a) With the help of proper circuit diagram, explain the working principle of bridge type full wave rectifier.

(b) Using Source Transformation method, find the voltage V_s and current through 12 V source in Fig. 2. [5+5]

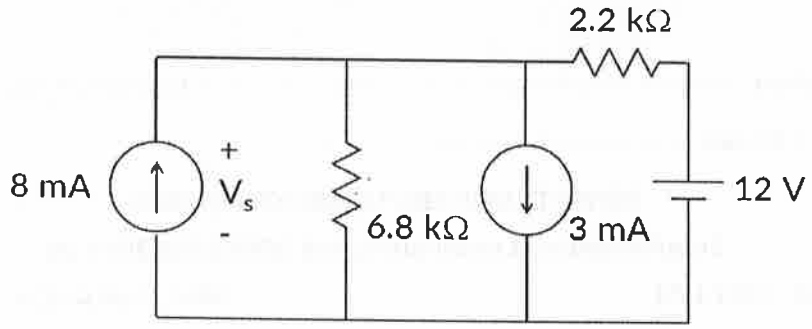

Fig. 2

Q.3 (a) Prove the Maximum Power Transfer Theorem theoretically.

(b) Assume a sinusoidal waveform with an amplitude of 10 V and 60 Hz is applied to the circuit shown in Fig. 3. Draw the output waveform across the resistor and diode by assuming the diode is (i) ideal (ii) non-ideal. [5+5]

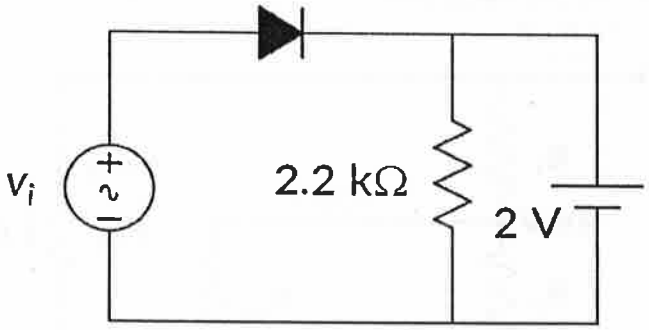

Fig. 3

Q.4 (a) With proper circuit diagram show the conditions required for balanced Wheatstone bridge.

(b) For the diode circuit shown in Fig. 4, D_1 and D_2 are silicon diodes having saturation currents of 5 nA and 10 nA respectively, at 300 K. Given that both the diodes are forward biased. Find the values of R for which the current is 15 mA. [5+5]

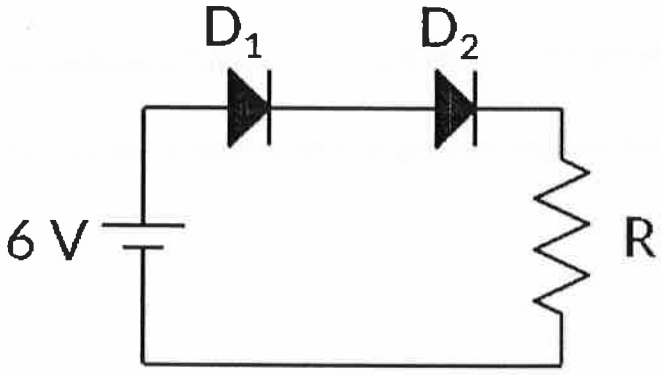

Fig. 4

Q.5 (a) For the given Boolean expression prove that $AB + \bar{A}C + BC = AB + \bar{A}C$

(b) For the circuits shown in Fig. 5, find the equivalent resistance R_T between nodes A and B. Assume that each resistor has value of 1 kΩ resistance. [5+5]

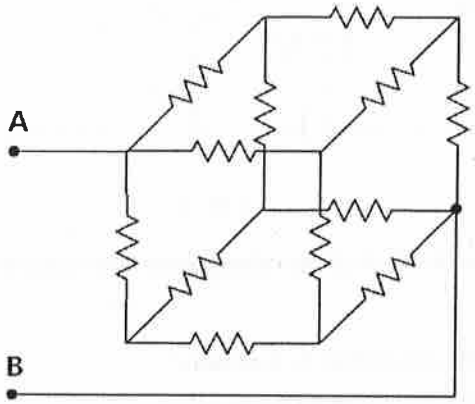

Fig. 5

Q.6 (a) Draw the circuit diagram of High Pass RC Filter. Derive the transfer function and cut-off frequency.

(b) In Fig. 6, draw the equivalent circuits in positive and negative halves. Also draw the output waveform (v_{out}) taken across R_L. Consider that the diodes are ideal. [5+5]

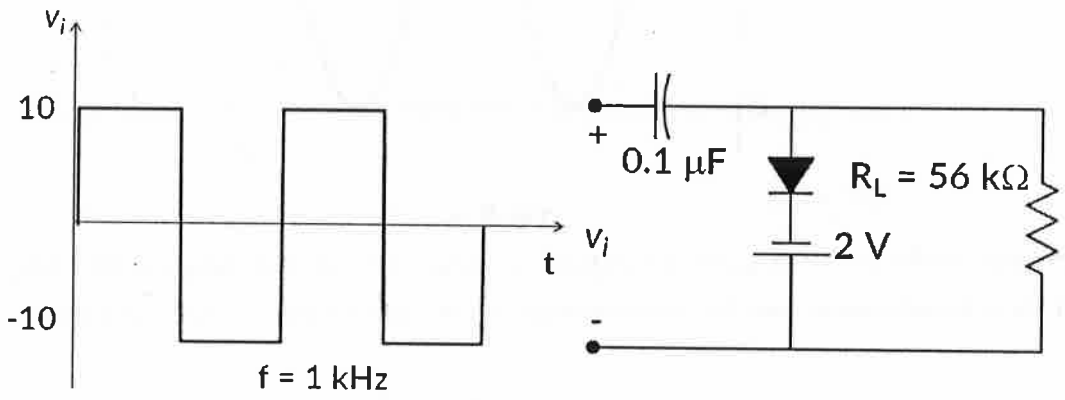

Fig. 6

Q.7 (a) Using superposition principle (superposition theorem) in the circuit shown in Fig. 7, find the current flowing through 2 Ω resistor.

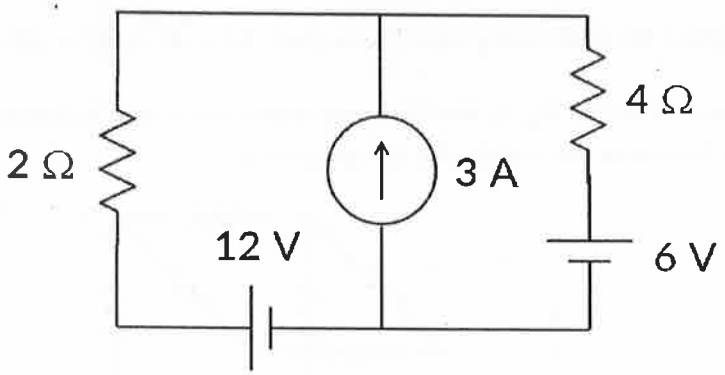

Fig. 7

(b) Convert $AB + \bar{A}C + B + A\bar{B}C$ into Standard Sum-of-Product (SOP) form. [5+5]

Q.8 Consider the signals shown in Fig. 8. Evaluate:

(a) Peak value, peak amplitude, peak to peak value

(b) Over one period, find average value and RMS value [5+5]

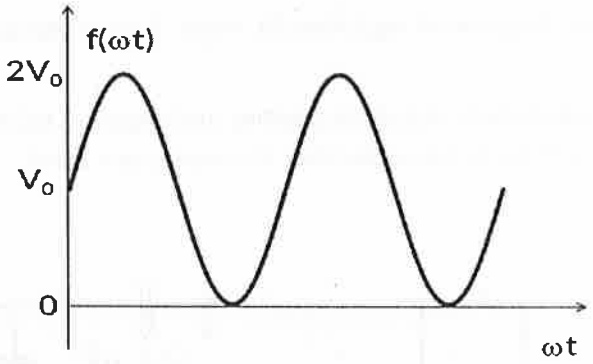

Fig. 8

Q.9 (a) Draw the circuit diagram of a positive clamper and explain its working Principle.

(b) Using Nodal analysis, find the current through and voltages across 5 Ω resistor in Fig 9. [5+5]

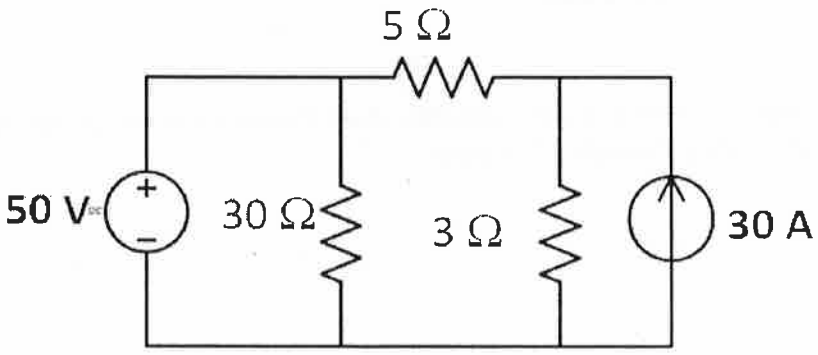

Fig. 9

Q.10 Consider the circuit shown in Fig. 10. Given that, V_{in} = 40 V, R = 50 Ω, R_L = 100 Ω and V_Z =20 V. Answer the following questions.

i) Compute the voltage drop across the load resistance R_L?

ii) Calculate the current through the load resistor R_L.

iii) Calculate the current through R.

iv) What is the current through the Zener diode?

v) What is the power consumed by Zener diode? [2+2+2+2+2]

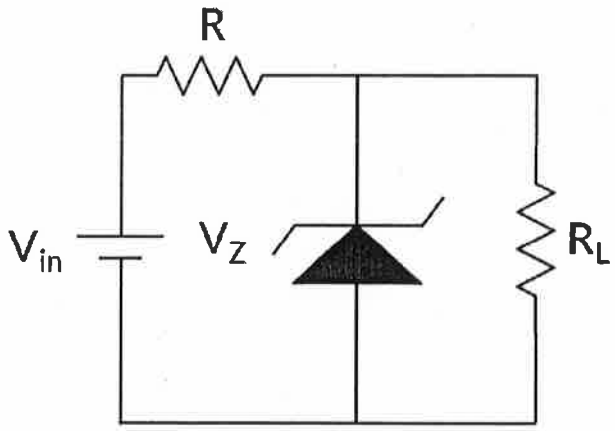

Fig. 10