Name of Student --- Enrolment No. ------------------

Department ----------------------------

BENNETT UNIVERSITY, GREATER NOIDA

Mid Term Examination, FALL SEMESTER 2018-19

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

COURSE NAME: Fundamentals of Electrical and Electronics Engineering

COURSE CREDIT: 5   MAX. MARKS: 40

Note

- Answer all questions
- Assume any missing data

Questions

1. Convert 109.328(10) to binary. After radix point, six positions are desired. **(4 Marks)** Radix point: or radix character is the symbol used in numerical representations to separate the integer part of a number from its fractional part.

2. Represent -47 in sign-bit (sign modulus) representation, 1's complement and 2's complement. Use 8-bits.   **(4 Marks)**

3. Consider the truth table given in Table 1. Write down logic function, *F(SOP)*, as a sum of products. Write down the logic function, *F(POS)* as a product of sums. Prove that *F(POS) = F(SOP)*.   **(4 Marks)**

Table 1: Truth table for problem 3

Inputs			Output
A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

4. Consider the logic function described by (1). Simplify the logic function. Draw the logic circuit that implements the function before logic simplification.   **(4 Marks)**

$$Y = \overline{A}B + B\overline{C} + BC + A\overline{B}\overline{C} \tag{1}$$

5. Draw a cross-section of an n-channel MOSFET and explain its working.   (3 Marks)

6. A 1 kΩ resistor is used as a load to a full-wave bridge rectifier which uses silicon diode. If the peak-inverse-voltage of each diode is 50 V, what is the maximum possible value of the amplitude of the input sine wave? Draw the circuit diagram of a full-wave bridge rectifier. Draw the waveform of the output current.   (6 Marks)

7. A Zener diode voltage regulator is shown in fig. 1. The voltage across the 18 Ω load stays 18 V as long as the Zener current is maintained between 200 mA and 2 A. Find the power rating of the Zener diode. Find the value of resistance R. The input voltage may vary between 22 V to 28 V.   (5 Marks)
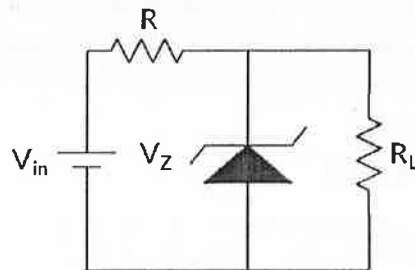

Fig. 1: Circuit for problem 7

8. In the circuit shown in Fig. 2, If $v(t)$ and $i(t)$ are in phase, what is the value of L? Given that $\omega = 4000$ rad/sec.   (4 Marks)

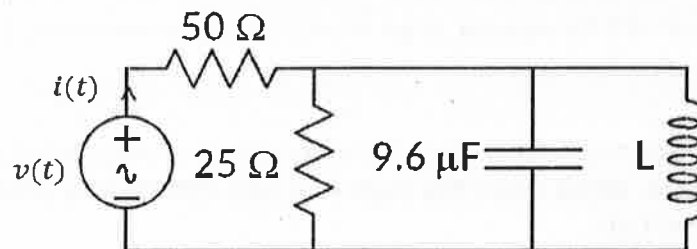Fig. 2: Circuit for problem 8

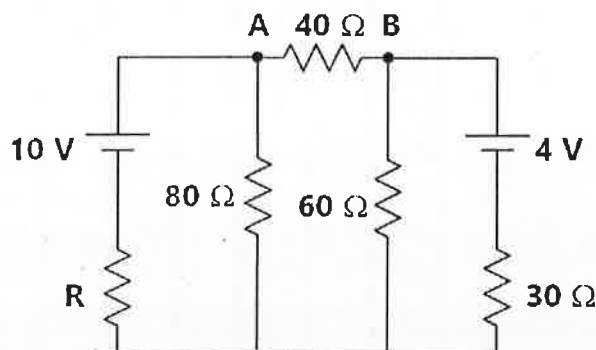9. For the circuit shown in fig. 3, find the maximum power delivered to 40 Ω resistance.   (6 Marks)

Fig. 3: Circuit for problem 9

---------------------- End of Questions ----------------------