# I/IV B.Tech. DEGREE EXAMINATIONS, NOV/DEC-2017

Second Semester
CSE/ECE/EEE
BASIC ELECTRICAL AND ELECTRONIC SCIENCES

Time: Three Hours   **Maximum marks:60**

Answer Question No.1 Compulsory   **12X1=12 M**

Answer ONE Question from each Unit   **4X12=48 M**

1.   a)   Define voltage and current?

     b)   Define form factor of a alternating current?

     c)   Explain Faradays law?

     d)   What do you mean by active power and reactive power?

     e)   Give the classification of instruments?

     f)   Define self inductance?

     g)   What are the applications of UJT

     h)   Write an expression for energy stored in a magnetic field?

     i)   Draw the V-I characteristics of semiconductor diode?

     j)   Write expression for mutual inductance?

     k)   Define operating point of a transistor?

     l)   What are the applications of MOSFET?

UNIT-I

2.   a)   Define (i) Complex power (ii) Power factor (iii) Peak factor (iv) Form factor
          and write its values to sine wave

     b)   For the circuit shown in fig find the voltage across the $10\,\Omega$ resistor and the
          current passing through it.

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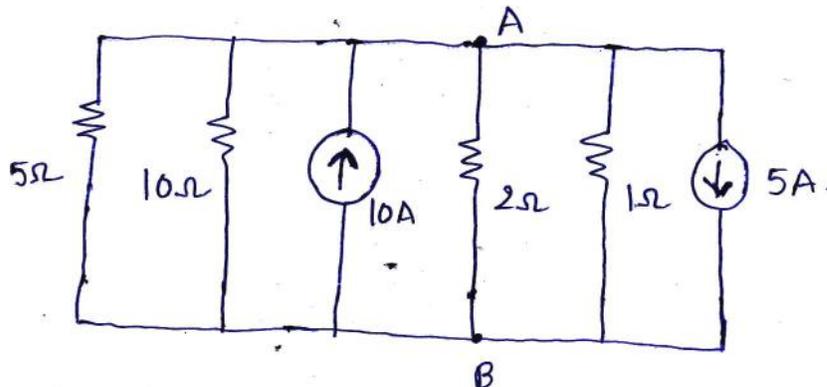
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3.   a)   Define and explain Kirchoff's current law applied to electrical circuits?

      b)   Explain the behaviour of resistance, inductance and capacitance to a sinusoidal voltage.

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UNIT-II

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4.   a)   State the principles of electromagnetic induction and explain statically induced EMF clearly.

      b)   Derive an expression for energy stored in a magnetic field.

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5.   a)   Explain the principle of operation of DVM.

      b)   Write short notes on Inductance in series.

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UNIT-III

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6.   a)   Explain the working principle of zener voltage regulator with a neat diagram?

      b)   Explain the working operation of Half wave rectifier with LC load?

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(OR)

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7.   a)   Draw and explain the principle of operation of full wave rectifier with out filter?

      b)   Explain the working of SCR and write its applications?

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UNIT-IV

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8.   a)   Explain the operation of BJT as an amplifier, with a neat diagram.

      b)   Discuss the operation of JFET with a neat sketch. Derive an expression of IDSS?

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(OR)

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9.   a)   Explain the operation of a Transistor under common emitter configuration with help of its characteristics?

      b)   Discuss the operation of MOSFET with a neat sketch and draw its transfer characteristics.

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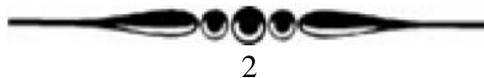
I/IV B. Tech. DEGREE EXAMINATIONS, JUNE / JULY 2017
SECOND SEMESTER
BT / CSE / ECE / EEE
BASIC ELECTRICAL AND ELECTRONIC SCIENCES

Time : **Three Hours**   Maximum Marks : **60**

Answer Question No. 1 Compulsory.   **12x1=12 M**

**Answer ONE question from each Unit.**   **4x12=48 M**

1. a) Find the charge, when a current of 10mA is flowing in 10 millisecond.

   b) How does an inductor act, when there is sudden rise in current ?

   c) Give the relation for S, P, Q (powers).

   d) Determine power factor for following circuit.
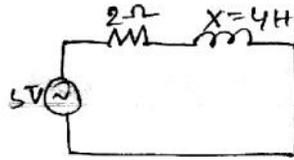
   e) What is static induced e.m.f., give examples ?

   f) State applications of Zener Voltage Regulator.

   g) What is damping torque, state methods of producing damping torque in a PMMC ?

   h) Draw the circuit and forward characteristics of a diode.

   i) What is peak inverse voltage (PIV) ?

   j) Sketch the circuit for CE configuration for a PnP.

   k) What is Transconductance (g_m) and state the equation for g_m.
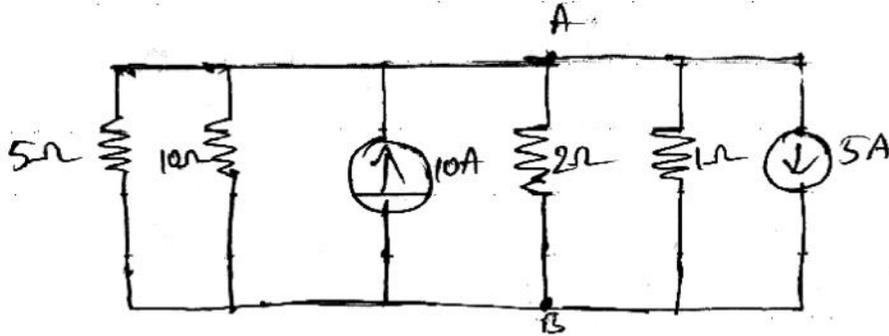
   l) What is latching current (I) ?

UNIT - I

2. a) Derive the relations for R, L and C when connected in series and parallel.

   b) For the circuit shown, find effective voltager across resistance and inductance and determine the phase angle.

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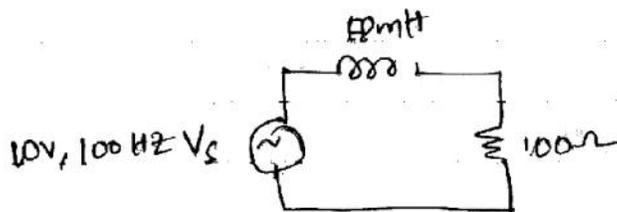
(OR)

3. a) For the circuit, find voltage across 10Ω Resistor and current passing through it.

b) Explain the phase relation in a pure inductor and capacitor, when sinusoidal input is given and also sketch wave form for V_m & i_m.

UNIT - II

4. a) Explain the working of a DVM, with any of the methodology.

b) What is coefficient of coupling and derive the Relation for coefficient of coupling.

(OR)

5. a) Why is Dot convention method used ? And explain it various configuration of magnetic circuits, also write the equation for voltages across inductors.

b) Explain the construction and working of a PMMC and also explain various torques present in it.

UNIT - III

6. Explain briefly the action of p-n junction diode (a) on open circuit (b) when provided with forward bias and (c) when provided with a reverse bias. Sketch the characteristic curves for both forward and Reverse bias.

(OR)

7. a) Draw the circuit diagram of full wave rectifier. having two diodes and explain its operation.

b) What is capacitor Input filter and explain operation of filter with Half Wave Rectifier and sketch wave forms.

UNIT - IV

8. a) Explain how transistor acts as an amplifier.

   b) For an n-channel Silicon FET, find pinch off voltage and channel half width, relative dielectric constant=12. Assume a=3 x 10^{-6}m $N_D=10^{21}$ electrons /m², $V_{GS} = \frac{1}{2} V_P$, $I_D=0$.

(OR)

9. a) For a transistor connected in common emitter configuration, sketch the output characteristics relating collector current and collector emitter voltage for value of base current. Explain the shape of characteristics.

   b) What is pinch off voltage V_P ? Derive the relation for it in terms of V_{GS}.