Registration No:

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## B.TECH 1ST SEMESTER EXAMINATIONS (REGULAR), NOV/DEC 2019
### BESBS1032 – Basic Electrical and Electronics Engineering

Time : 3 Hours  Maximum : 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

<u>PART – A: (Multiple Choice Questions) 10 × 1=10 Mark</u>

Q.1. Answer <u>All</u> Questions.

| | | |
|---|---|---|
| a | Application of Norton's theorem to a circuit yields <br> a) equivalent current source and impedance in series <br> b) equivalent current source and impedance in parallel <br> c)equivalent impedance <br> d) Equivalent current source | [CO 1][PO 1] |
| b | If Current and voltage are 90 degree out of phase, then the power will be --------- <br> a)Infinite  b)Maximum   c)Minimum  d)Zero | [CO 1][PO 1] |
| c | The unit of magnetic flux is-------- <br><br> a) Henry   b)Weber  c)Ampere-turn/weber    d)Ampere/metre | [CO 1][PO 1] |
| d | If a shunt motor is started with its field winding open then <br> a)It will rotate at the same speed as that with its field winding closed <br> b) It will rotate at less speed as that with its field winding closed <br> c) It will rotate at dangerously high speed <br> d) None of these | [CO 2][PO 2] |
| e | A pn junction acts as a <br> a) Controlled Switch   b) Bidirectional Switch  c)Unidirectional Switch   d)None of the above | [CO 1][PO 1] |
| f | In a BJT as collector to base voltage increases the emitter current <br> a) Remains same     b)Increases slightly <br> c)Decreases slightly     d) Depends upon doping of the emitter region | [CO 1][PO 1] |
| g | The unit of MMF is _____. <br> a) AT/m         b) Weber                 c) AT              d) none | [CO 2][PO 1] |
| h | In function generator, the output waveform of integrator is <br> a) Sinusoidal  b) Square  c) Triangular  d) Saw-tooth | [CO 3][PO 1] |
| i | The universal gate is ……………… <br> a)NAND gate  b)OR gate  c)AND gate  d)None of the above | [CO 2][PO 1] |
| j | In a transformer electrical power is transferred from primary to secondary <br> a) Through air  b)By magnetic flux  c)Through insulation medium   d)None of these | [CO 1][PO 1] |

<u>PART – B: (Short Answer Questions)    10x2=20 Marks</u>

Q.2. Answer <u>ALL</u> questions

| | | |
|---|---|---|
| a | State Thevenin's theorem | [CO1] [PO1] |
| b | An alternating voltage is represented by v=282.8 sin314t, find a) RMS Voltage, b)frequency | [CO4] [PO1] |
| c | A circular iron ring wound with some turns of coil develops a magnetic flux of 20mWb when the coil carries a current of 2A. If the reluctance of the core is 2000AT/Wb, Find the approximate number of turns present in the coil. | [CO1] [PO1] |
| d | How is voltage generated in rotating machines? | [CO1] [PO2] |
| e | Write various losses in a transformer. | [CO1] [PO1] |
| f | What are the essential components of a CRT? | [CO3] [PO2] |

g   What is meant by barrier potential?                                                    [CO4] [PO1]

h   Why transistor is also called bipolar junction transistor?                             [CO1] [PO1]
i   Convert the decimal number 23 into  equivalent binary number                           [CO4] [PO1]
j   Which gates are called as the universal gates? What are its advantages?                 [CO4] [PO1]

<div align="center">

**PART – C: (Long Answer Questions)     4x10=40 Marks**
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Answer *ALL* questions

**Q.3**

a   Find the Thevenin's equivalent voltage and resistor across $3\Omega$
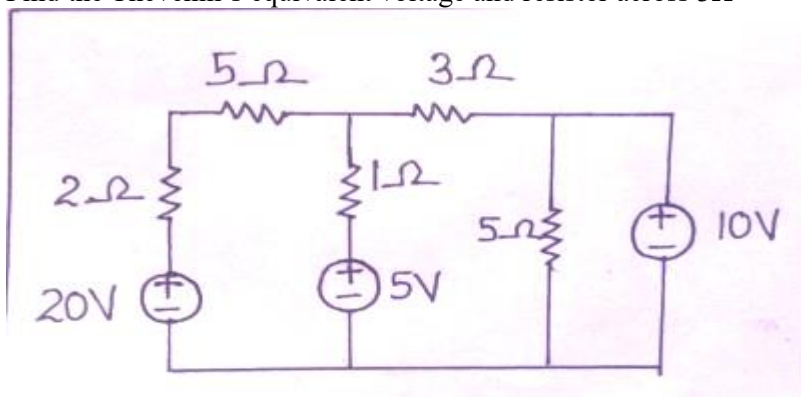


7 Marks   [CO2] [PO1]

b   In the above problem , Find the current in $3\Omega$ resistor using Thevenin's theorem.

3 marks   [CO2] [PO1]

<div align="center">OR</div>
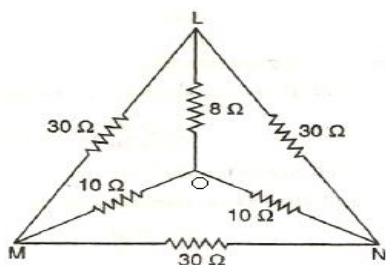
c   A balanced 3-ph delta load has load impedance of (5-j10) ohms per phase and is supplied from a balanced 3-ph 440V, 50 Hz AC supply.    Calculate the values for:
   (a)  Line voltages.
   (b)  Phase voltages
   (c)  Line currents
   (d)  Phase currents.

   Power consumption at the load

6 marks   [CO2] [PO2]

d   Calculate the resistance $R_{LN}$ from the circuit below



4 marks   [CO1] [PO2]

**Q.4**

a   Describe the basic principle of operation of a single phase transformer and derive the emf equation

6 Marks   [CO1] [PO2]

b   A non inductive resistor is connected in series with a coil. The combination is connected across 230V, 50Hz supply and draws a current of 3 A from the line. The voltage across the choke coil and the resistor are 120V and 210V respectively. Calculate the resistance and reactance of the coil, power observed by the coil and the total power.

4 Marks   [CO1] [PO2]

<div align="center">OR</div>

c   With neat diagram explain the main parts of d.c machine ? Mention the functions of each part.

7 Marks   [CO1] [PO1]

d   State the classification of dc machines.

3 Marks   [CO1] [PO4]

Q.5

| | | | |
|---|---|---|---|
| a | What are the different modes of operation of a transistor | 3Marks | [CO3] [PO1] |
| b | explain the operation of n-p-n transistor under different modes | 7 Marks | [CO3] [PO1] |

<div align="center">OR</div>

| | | | |
|---|---|---|---|
| c | Explain the operation of bridge rectifier with a neat diagram | 6 marks | [CO3] [PO2] |
| d | State briefly the characteristics of bridge rectifier I) Peak Inverse Voltage ii) Ripple factor | 4 Marks | [CO3] [PO1] |

Q.6

| | | | |
|---|---|---|---|
| a | Draw a neat block diagram of CRO. | 4 Marks | [CO3] [PO1] |
| b | Explain the functioning of CRO | 6 marks | [CO3] [PO1] |

<div align="center">OR</div>

| | | | |
|---|---|---|---|
| c | Prove the following De Morgan's law (ABC)' = A' + B' + C'. | 6 Marks | [CO4] [PO2] |
| d | Draw the symbol and construct the truth table for three input Ex-Or gate | 4 Marks | [CO4] [PO1] |