PAPER ID-310992

Roll No:

B.TECH
(SEM I) THEORY EXAMINATION 2020-21
BASIC ELECTRICAL ENGINEERING

Time: 3 Hours   *Total Marks: 70*

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   **Attempt** *all* **questions in brief.**   **2 x 7 = 14**

a.	Explain KCL & KVL theorem.
b.	Write statement for superposition theorem.
c.	Define Active & Reactive power.
d.	Write working principle of Transformer.
e.	3-phase 4 pole induction motor is supplied from 3-phase 50 Hz supply. Calculate Rotor Speed when slip is 4%
f.	Draw speed –torque characteristics of dc series motor?
g.	6-pole lap wound dc generator generates 220V at 1100rpm. If this generator is now wave wound and runs at 500 rpm, what will be the generated voltage?

SECTION B

2.   **Attempt any** *three* **of the following:**   **7 x 3 = 21**

a.	Using Thevenin's Theorem, find the current flowing through 6 ohm resistance in following circuit in Fig.1 Fig.1
b.	What are the causes and effect of low power factor? And how to improve low power factor.
c.	Explain with a neat diagram, the constructional features and workings of Dynamometer type wattmeter. Also give its merits and demerits.
d.	What are the similarities and dis-similarities between electric circuit and magnetic circuit? Also give relation between MMF, Flux and reluctance.
e.	Derive the expression of torque of DC Machine. Briefly Explain what role Back EMF plays starting & running of motor.

SECTION C

3.   **Attempt any** *one* **part of the following:**   **7 x 1 = 7**

(a)	Define active, passive, linear, non linear and unilateral, bilateral elements with examples.
(b)	A circuit consists of three parallel branches. The branch currents are represented by $i_1 = 10 \sin wt$, $i_2 = 20 \sin (wt + 60^0)$, $i_3 = 7.5 \sin (wt - 30^0)$. Find the resultant current and express it in the form $i = I_m \sin (wt + \varphi)$.

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4. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Derive the expression of resonant frequency of parallel R-L-C Circuit. |
| (b) | An Electrical circuit connected to v=100 sin(628t+ 60) it draw current i=15 sin(628t+ 30), identify the circuit , also find the value of Resistance, Rectance, Power ,Power Factor. |

5. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | A balanced star-connected load of impedance, Z=10∟60°Ω is connected to line voltage of 230V.Obtain the phase current, phase voltage and power supplied to load |
| (b) | Explain with neat diagram, working principle of Moving Iron type electrical measuring instruments also explain different error occur in it. |

6. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | What are the methods of power measurement in 3-phase AC circuit? Explain two wattmeter methods for delta connected load. |
| (b) | Explain working principle of Auto transformer; write its advantages & disadvantages. |

7. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Why is the synchronous motor not self starting? Explain advantages & disadvantages along with applications of Synchronous motor. |
| (b) | Explain the working of three phase induction motor. Explain slip-torque characteristics of three phase induction motor. |