Total No. of Questions – [ ] Total No. of Printed Pages

| G.R. No. | |
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**SEPTEMBER 2017 / IN - SEM (T1)**

**F. Y. B.TECH. (COMMON) (SEMESTER - I)**

**COURSE NAME : BASIC ELECTRICAL ENGINEERING**

**(2017 PATTERN)**

**Solution and scheme of marking**

Time : [1 Hour] [Max. Marks : 30]

**(*) Instructions to candidates:**

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**

Q 1) a) Circuit dig 01M

Derivation correct steps 02M

Final three correct formulas 03M

b) Statement 02M

To find $V_{Th}$ 01M

To find $R_{eq}$ 01M

Thevenin's Equivalent circuit 01M

To find $I_L$ 01M

c) $5I_1 + 10 I_2 = 4$ 01M

$4I_1 - 9 I_2 = -3$ 01M

$I_{5\Omega} = 0.0706$ A 02M

**OR**

Q2) a) KCL- statement 01M, Explanation with simple circuit 02M

KVL- statement 01M, Explanation with simple circuit 02M

b) For 40V, $I_{XY}$ = 5A (forward) 02M

For 20V, $I_{XY}$ = 2.5A (reverse) 02M

For 10V, $I_{XY}$ = 1.876A (forward) 01M

$I_{XY}$ = 5-2.5+1.876=4.376A forward 01M

c) 6 ll 6 = 3 and 12 ll 12= 6 Ω 02M

3, 3, 6 in series = 12 Ω 01M

12 ll 10 = 5.45 Ω 01M

Q3) a) $X_L$ = 31.41 Ω, Z=37.24 Ω 01M

I = 5.37A 02M

p.f. = 0.5370 lag 01M

P = 576.74 W 02M

b) Circuit diagram 01M

Derivation 02M

Phasor diagram 01M

c) Impedance triangle 01M

Z=R - j $X_C$ Ω 01M

$\phi = \tan^{-1}(-X_C / R)$ Negative 01M

p.f. - leading 01M

OR

Q4) a) $X_c$ = 31.83 Ω 01M

Impedance, Z = 50-j31.83 Ω 01M

Power factor = 0.8435 leading 01M

Current = 3.88 < 32.48$^0$ A 02M

Phasor diagram 01M

b) Form factor Definition and value for sinusoidal waveform 01+01 02M

Peak factor Definition and value for sinusoidal waveform 01+01 02M

c) Circuit diagram 01M

Derivation 02M

Phasor diagram 01M