College of Engineering, Pune

(An Autonomous Institute of Government of Maharashtra)

Department of Electrical Engineering

T-2 Examination-2022

Course:-Basic Electrical Engineering (E-Group)

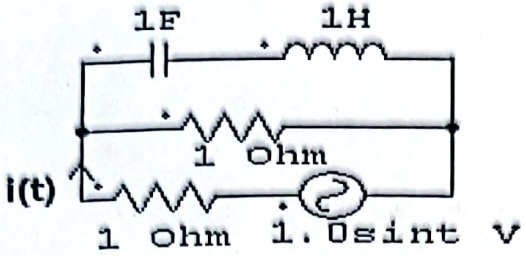
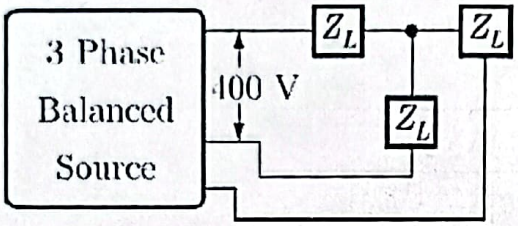
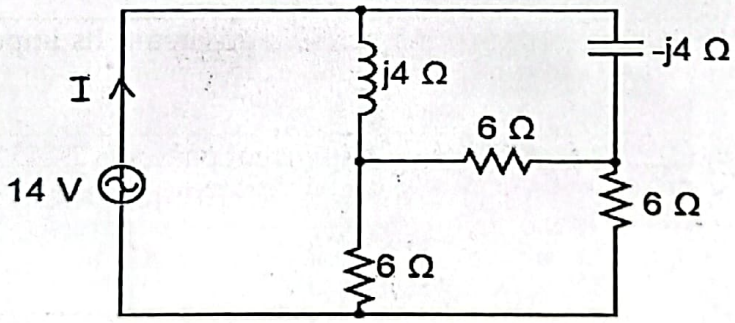
Programme: F. Y. B. Tech. (Division 6-10) Date: 24.07.2022

Max. Marks: 20 Time: 4-5 pm

Instructions:-

1. All questions are compulsory.
2. Make necessary assumptions and assume suitable data wherever required.
3. Non programmable calculator is allowed.
4. Figures to the right indicate full marks

Q. 1	**Rewrite the following with correct answer.**	8
(i)	In delta connection, line current lags behind the phase current by____deg.	
(ii)	A circuit with a resistor, inductor and capacitor in series is resonant at f_0 Hz. If all the component values are now doubled, the new resonant frequency is ____Hz. a) 2 f_0 b) still f_0 c) $f_0/2$ d) $f_0/4$	
(iii)	To a highly inductive circuit, a small capacitance is added in series. The angle between voltage and current will a) increase b) decrease c) remain nearly the same d) become indeterminant	
(iv)	With reference to the applied voltage, current in a circuit is expressed as $i = 3.2\sin(314t-30°)$. The circuit is ---------- & its power factor is ----------. a) inductive, 0.866 lead b) capacitive, 0.866 lead c) inductive, 0.866 lag d) capacitive, 0.866 lag	
(v)	A pure inductive coil of 20 mH is connected across a dc circuit. Its impedance will be ----------.	
(vi)	The voltage phasor of a circuit is $10\angle 15°$ V and the current phasor is $2\angle -45°$ A. The active and reactive powers in the circuit are ----------respectively. a) 10 W and 17.32 VAr b) 5 W and 8.66 VAr c) 20 W and 60 VAr d) $20\sqrt{2}$ W and $10\sqrt{2}$ VAr	

(vii)	The rms value and the mean value is same in case of --------- a) Triangular wave b) Sine wave c) Square wave d) Half wave rectified sine wave	
(viii)	The RMS value of the current *i(t)* in the circuit shown below is :  a) 1/2 A b) 1/√2 A c) 1 A d) √2 A	
Q. 2	**Solve the following problems:**	
(i)	A circuit takes a current of 8 A at 100 V, the current lagging by 30° behind the applied voltage. Calculate the values of equivalent resistance and reactance of the circuit.	4
(ii)	If the 3-phase balanced source in the figure delivers 1500 W at a leading power factor 0.844 then the value of ZL (in ohm)  	4
(iii)	In the circuit shown below, determine the current I. Take voltage applied as a reference.  	4