Practice Questions

Q.No1.What is the necessity of earthing the electrical appliances? With a neat sketch explain a typical earthing system.

Q.No.2.The details of a domestic load and their operating schedule are as follows. Find the energy consumed during a month of 30 days. Calculate the energy bill for the month if the energy tariff per unit is Rs.5. and the fixed charge per month is Rs.100.(Ans:Energy consumed per month 241.8 kWh(units), Energy bill per month Rs.1309)

|  |  |  |  |
| --- | --- | --- | --- |
| Load (appliance) | Number | Power rating(each) | Duration of operation in hours per day |
| Tube light | 4 | 40 W | 5 |
| Fan | 4 | 75 W | 6 |
| Fridge | 1 | 300 W | 4 |
| Water heater | 1 | 2 kW | 2 |
| LED bulbs | 5 | 13 W | 4 |

Q.No.3 For an alternating voltage v = 325.27sin(314t) volts find i)RMS voltage ii) Average voltage iii) frequency in Hz and time period iv)instantaneous voltage at t = 0.005 sec and at t=0.002sec v) time at which the instantaneous voltage is 200 V. (Ans:230V,206.87V,50 Hz, 0.02sec,325.27Vand 191.10V, 2.108msec)

Q.No.4.Explain voltage and current in purely inductive circuit. Show that the energy consumed by a pure inductance is zero.

Q.No 5.Derive an expression for the average power consumed by a single phase R-L series circuit. Show the wave forms for voltage, current and power.

Q.No 6.A solenoid coil has a resistance of 2 Ω and inductance of 5 mH with a supply voltage of single phase 230 V, 50 Hz. Find i)impedence ii) current iii) power factor iv) power consumed and v) reactive power(Ans:2.5426/\_38.13 Ω,90.55/\_-38.13 A, 0.7866,460W,361VAR)

Q.No 7.A single phase 250 V, 50 Hz AC circuit takes a current of 2∠450 A .Find the parameters in the circuit and power consumed .( Ans: leading current means R & CZ=125/\_-45 Ω, R=88.38 Ω, Xc=88.38 Ω, C=36μF)

Q.No 8 An alternating current varying sinusoidal with a frequency of 50 Hz has RMS value of 20 A. Find the Max.value,Time period, instantaneous current at 0.005 sec and 0.015 sec. Find the time at which the current attain 14.14 A. (Ans:28.28A,0.02sec,28.28 A,-28.28A,1.66msec)

Q.No9 Find the impedence, current, p.f., power consumed, active and reactive power in a R L C series circuit with single phase, 230 V, 50 Hz supply with resistance 5Ω, inductance 0.02 H, capacitance 150μF. Draw phasor diagram.(Ans:XL=6.28 Ω, XC=21.22 Ω,Z=15.75/\_-71.49 Ω,14.60/\_71.49A, pf 0.3174(lead),1065.82 W, 3184.28 VAR)

Q.No 10 An inductor takes 2 A consuming 400 W power in a 250 V, 50 Hz single phase circuit. Find the parameters of the inductor.(Ans:Z=125 Ω, cosф=0.8,R=100 Ω, XL=75 Ω, L=0.238H)

Q.No 11 A sinusoidal voltage 80+j60 V is applied to a circuit and the current is -4+j10 A. Find

i) impedance of the circuit ii)power factor iii) power consumed .Show the voltage and current phasors.(Ans:9.28/\_-74.93 Ω, p.f.0.26, 280 W)

Q.No 12.Find the circuit parameters if the applied voltage is v= !00sin(314t) V and the current is

i=100sin(314t-30)A. Draw voltage and current phasors (R=8.77Ω, L=5H)

Q.No 13 Find total impedence &currents in all the branches if supply voltage is 230 V, 50 Hz

2-j4Ω

3+j4Ω

5+j6Ω