**Revision questions G006A**

1. **The primary winding of a 440/55 V transformer has 400 turns. How many turns are there on the secondary winding?**

## Show all working out

**NS = VS X NP 400 X 55 = 50 T**

 **VP 440**

 **50 Turns**

1. **The 110 V output of a transformer is applied to a 22 ohm resistive circuit, *causing 0.22 A to flow in the primary winding. Calculate the primary voltage.***

## Show all working out

**IS = 110V = 5A**

 **22**

**VP = IS VP = VS X IS 110 X 5 = 2500V**

**VS IP IP 0.22**

**VP =**

 **Answer 2500 V**

1. **The 68 V output of a transformer is applied to a 48 ohm resistive circuit, causing 0.2 A to flow in the primary winding. Calculate the primary voltage.**

## Show all working out

**IS = 68V = 1.41A**

 **48**

**VP = IS VP = VS X IS 68 X 1.41 = 479.4V**

**VS IP IP 0.2**

**VP =**

1. **240 V is applied to the primary winding of a transformer having 1100 turns. If the secondary has 900 turns, calculate the secondary voltage.**

***Show all working out***

**VS = VP X NS 240 X 900 = 196.36 V**

 **NP 1100**

**Answer 196V**

1. **230 V is applied to the primary winding of a transformer having 1000 turns. If the secondary has 500 turns, calculate the secondary voltage.**

## Show all working out

**VS = VP X NS 230 X 500 = 115 V**

 **NP 1000**

 **115 V**

1. **A 240/115 V single-phase transformer has 960 turns on its primary winding. Calculate the number of turns required on the secondary winding.**

## Show all working out

**NS = VS X NP 115 X 960 = 460 T**

 **VP 240**

***Answer: 460 turns***

1. **A 230/110 V single-phase transformer has 800 turns on its primary winding. Calculate the number of turns required on the secondary winding.**

## Show all working out

**NS = VS X NP 110 X 800 = 383T**

 **VP 230**

**383 turns**

1. **A transformer with a stepdown ratio of 10:1 is to be connected to a 415volt supply. Calculate the expected ouput of the transformer secondary below:**

***Show all working out***

**415/10 = 41.5 V**

**9) The 48 V output of a transformer is applied to a 48 ohm resistive circuit, causing 0.38 A to flow in the primary winding. Calculate the primary voltage.**

**Show all working out**

**IS = 48V = 1.0A**

 **48**

**VP = IS VP = VS X IS 48 X 1.0 = 123.31V**

**VS IP IP 0.38**

**10) The primary winding of a transformer having 1000 turns. If the secondary is 240V and has 500 turns, calculate the primary voltage.**

**Show all working out**

**VP = NP X VS 1000 X 240 VP = 480 V**

 **NS 500**

**11) A 415/120 V single-phase transformer has 1260 turns on its secondary winding. Calculate the number of turns required on the primary winding.**

**Show all working out**

**NP = VP X NS 415 X 1260 NP = 4357.5 T**

 **VS 120**

**12) A 440/230 V single-phase transformer has 962 turns on its secondary winding. Calculate the number of turns required on the primary winding.**

**Show all working out**

**NP = VP X NS 440 X 961 NP = 1840 T**

 **VS 230**

**13) A 960VA transformer has 1500 turns on the primary and 300 turns on the secondary.What is the secondary voltage and current if 240V is applied to the primary winding?**

**Show all working out.**

**Vp/Vs=Np/Ns=Is/Ip P=I\*V**

**1500/300=5 960/240=4**

**240/5=48V sec 4\*5=20A sec**

**48V,20A**

**14) What is the efficiency of a 2000VA single phase transformer if the iron losses are 50W and the copper losses are 100W?**

**Show all working out.**

**Eff=Pin/Pout\*100%**

**Eff=2000/(2000+50+100)\*100%**

**93%**

**15) If a 240v/50V step down transformer has a output voltage of 47V when full load is connected what is its voltage regulation?**

**Show all working out.**

**VR = (Vnl – Vfl) / Vfl \*100%**

**VR = (50 – 47) / 47 \* 100%**

**VR = 6.3%**

**16) A 2400VA step down autotransformer has a primary voltage of 240v and a secondary voltage of 200v. Calculate the current that will flow in the shared portion of the winding at full load.**

**Show all working out.**

**2400 / 240 = 10A in the primary**

**2400 / 200 = 12A in the secondary**

**12 – 10 = 2A in the shared portion of the winding.**

**17) A 415v:240v 100A transformer requires 16.6V on the primary to produce the full rated current in the secondary with the secondary short circuited. What is the transformers percentage impedance?**

**Show all working out.**

**Z%=Vps/Vp\*100% Z%=16.6/415\*100%**

**Z%=4%**

**18) A 1200VA transformer has 1700 turns on the primary and 250 turns on the secondary.What is the secondary voltage and current if 220V is applied to the primary winding?**

**Show all working out.**

**Vp/Vs=Np/Ns=Is/Ip 1700/250 = 6.8 220/6.8 = 32.4V sec**

**Ie 1200/32.4**

**32.4V,37A**

**19) What is the efficiency of a 2500VA single phase transformer if the iron losses are 25W and the copper losses are 90W?**

**Show all working out.**

**Eff=Pin/Pout\*100%**

**Eff=2500/(2500+25+90)\*100% = 96%**

**20) If a 230V/65V step down transformer has a output voltage of 61V when full load is connected what is its voltage regulation?**

**Show all working out.**

**VR = (Vnl – Vfl) / Vfl \*100%**

**VR = (65 – 61) / 61 \* 100%**

**VR = 6.6%**

**21) A 2800VA step down autotransformer has a primary voltage of 240v and a secondary voltage of 220v. Calculate the current that will flow in the shared portion of the winding at full load.**

**Show all working out.**

**2800 / 240 = 11.66A in the primary**

**2800 / 220 = 12.72A in the secondary**

**12.72 – 11.66 = 1.06A in the shared portion of the winding.**

**22) A 440v/240v 100A transformer requires 18.3V on the primary to produce the full rated current in the secondary with the secondary short circuited. What is the transformers percentage impedance?**

**Show all working out.**

**Z%=Vps/Vp\*100% Z%=18.3/440\*100%**

**Z%=4.15%**