

There is more to practice on **ElectroMath in module 3**

### Generators & Motors

- 1) An alternating current generator is operating at 50 kVA in a circuit with a power factor of 0.8. The real power is a) 72kW b) 50kW c) 40kW
- 2) A generator is labeled as having 115V/200V, 20A and PF 0.8. What is the apparent power in each line that the generator can produce?  
a) 4kVA b) 2.3kVA c) 2.3kW
- 3) The frequency of the output of a 4 pole generator is 400Hz. The generator is turning at  
a) 6000 RPM b) 3000 RPM c) 12000 RPM
- 4) A 30 KVA rated generator has a power factor of 0.8. What is its maximum consistent power?  
a) 37.5 KW b) 24 KW c) 30 KW
- 5) A generator supplies 25 A, 4 V and 50 W. What is the apparent power and the power factor?  
a) 100 VA and 2  
b) 400 VA and 0.5  
c) 100 VA and 0.5
- 6) An alternator delivers 500V RMS at 1 ampere. The power factor is 0.8. The true power is  
a) 100VA  
b) 400W  
c) 500W
- 7) A generator rated at 30 KVA and power factor 0.8 has a maximum continuous power output of  
a) 30 kW b) 24 kW c) 48 Kw
- 8) An AC generator has four poles. To produce a frequency of 400Hz it must achieve a speed of  
a) 6000 RPM b) 3000 RPM c) 12000 RPM
- 9) If the phase voltage of a star wound generator is 115V, what would be the line to line voltage?  
a) 220V b) 200V c) 180V
- 10) A generator supplies 150V AC phase and load is 10 Ohms per phase. What is the phase current?  
a) 1.5 A b) 25.5 A c) 15 A
- 11) An ac generator rated at 90 kVA with a power factor of 0.85 lagging is capable of supplying  
a) 90 kW of continuous power b) 105.88 kW of continuous power c) 76.5 kW of continuous power
- 12) A single-phase AC generator has 12 poles and it runs at 600 RPM. Which one of the following is the output frequency of the generator?  
a) 120 Hz b) 60 Hz c) 50 Hz
- 13) What is the maximum active power supplied from a 40kVA generator at 0.9 PF?  
a) 36 kW b) 8 kW c) 50 kW

### ANSWERS:

1c 2a 3c 4b 5c 6b 7b 8c 9b 10c 11c 12b 13a

1) An alternating current generator is operating at 50 kVA in a circuit with a power factor of 0.8.

The real power is a) 72kW b) 50kW c) 40kW

$$50 \times 0.8 = 40$$

2) A generator is labeled as having 115V/200V, 20A and PF 0.8.

What is the apparent power in each line that the generator can produce?

a) 4kVA b) 2.3kVA c) 2.3kW

Apparent power means **Volts x Amps!!!** (no powerfactor is considered, as it is apparent power)

$$200V \times 20A = 4,000 VA = 4kVA$$

3) The frequency of the output of a 4 pole generator is 400Hz. The generator is turning at

a) 6000 RPM b) 3000 RPM c) 12000 RPM

The speed of a an AC motor or generator is 60 times the frequency divided by the **pair** of poles.

$$60 \times 400 / 2 = 12,000 \quad 4 \text{ poles} = 2 \text{ ea pair of poles!!!}$$

4) A 30 KVA rated generator has a power factor of 0.8. What is its maximum consistent power?

a) 37.5 KW b) 24 KW c) 30 KW

$$30 \times 0.8 = 24$$

5) A generator supplies 25 A, 4 V and 50 W. What is the apparent power and the power factor?

a) 100 VA and 2 b) 400 VA and 0.5 c) 100 VA and 0.5

$$25A \times 4V = 100VA \text{ is the apparent power and } 50W \text{ is } 0.5 = \text{one half of } 100W \text{ or } 100VA$$

6) An alternator delivers 500V RMS at 1 ampere. The power factor is 0.8. The true power is

a) 100VA b) 400W c) 500W

$$500V \times 1A \times 0.8 = 400VA = 400W$$

7) A generator rated at 30 KVA and power factor 0.8 has a maximum continuous power output of

a) 30 kW b) 24 kW c) 48 Kw

$$30kVA \times 0.8 = 24kVA = 24kW$$

8) An AC generator has four poles. To produce a frequency of 400Hz it must achieve a speed of

a) 6000 RPM b) 3000 RPM c) 12000 RPM

The speed of a an AC motor or generator is 60 times the frequency divided by the **pair** of poles.

$$60 \times 400 / 2 = 12,000 - \text{do not forget , it is pair of poles!!!}$$

9) If the phase voltage of a star wound generator is 115V, what would be the line to line voltage?

a) 220V b) 200V c) 180V

$$\text{Phase voltage} \times 1.73 = \text{line voltage. } 115 \times 1.73 = 200$$

10) A generator supplies 150V AC phase and load is 10 Ohms per phase. What is the phase current?

a) 1.5 A b) 25.5 A c) 15 A

$$A = \frac{\text{Volts}}{\text{Ohms}} = \frac{150\text{Volts}}{10\text{Ohms}} = 15A$$

11) An ac generator rated at 90 kVA with a power factor of 0.85 lagging is capable of supplying

a) 90 kW of continuous power b) 105.88 kW of continuous power c) 76.5 kW of continuous power

$$90kVA \times 0.85 = 76.5kVA \text{ or } 76.5kW$$

12) A single-phase AC generator has 12 poles and it runs at 600 RPM.

Which one of the following is the output frequency of the generator?

a) 120 Hz b) 60 Hz c) 50 Hz

The speed of a an AC motor or generator is **60 times the frequency** divided by the **pair** of poles.

$$\text{Frequency} = \text{speed} \times \text{pair of poles} / 60 = 600 \times 6 / 60 = 60Hz$$

13) What is the maximum active power supplied from a 40kVA generator at 0.9 PF?

a) 36 kW b) 8 kW c) 50 kW

$$40kVA \times 0.9 = 36 kVA \text{ or } kW$$