UNIT NO: 5 SINGLE PHASE AC CIRCUIT (PART A)

1. The power factor at resonance in R-L-C series circuit is
 a. Zero
 b. 0.08 lagging
 c. 0.8 leading
 d. Unity
Answer: d

2. In a R-L-C circuit
 a. Power is consumed in resistance and is equal to IR
 b. Exchange of power takes place between inductor and supply line
 c. Exchange of power takes place between capacitor and supply line
 d. All above are correct

Answer: d

3. In an AC. circuit, a low value of kVAR compared with kW indicates
 a. Low efficiency
 b. High power factor
 c. Unity power factor
 d. Maximum load current

Answer: b

4. The power factor of a D.C. circuit is always
 a. Less than unity
 b. Unity
 c. Greater than unity
 d. Zero

Answer: b

5. Which triangles are used in series ac circuit?
 a. Voltage triangle
 b. Impedance triangle
 c. power triangle
 d. all of the above

Answer: d

6. The product of apparent power and cosine of the phase angle between circuit voltage and current is
 a. True power
 b. Reactive power
 c. Volt-amperes
 d. Instantaneous power

Answer: a

7. In a series resonant circuit, the impedance of the circuit is
 a. Minimum
 b. Maximum
 c. Zero

d. None of the above

Answer: a

8. In a circuit containing R, L and C, power loss can take place in
a. C only
b. L only
c. R only
d. All above

Answer: c

9. Which of the following refers to a parallel circuit?
a. The current through each element is same
b. The voltage across element is in proportion to it's resistance value
c. The equivalent resistance is greater than any one of the resistors
d. The current through any one element is less than the source current

Answer: d

10. A sine wave has a frequency of 50 Hz. Its angular frequency is _____ radian/second.
a. 100 π
b. 50 jt
c. 25 JT
d. 5 π

Answer: a

11. The apparent power drawn by an A.C. circuit is 10 kVA and active power is 8 kW. The reactive power in the circuit is
a. 4 kVAR
b. 6 kVAR
c. 8 kVAR
d. 16 kVAR

Answer: b

12. The net power in a series R-C circuit is
a. Zero
b. Positive
c. Negative
d. None of these

Answer: b

13. The two alternating quantities could be added by constructing
a. Squares
b. Parallelograms
c. Rhombus
d. Trapeziums

Answer: b

14. The power factor of a series RL ac circuit is given by

a. X_L/R
b. R/X_L
c. R/Z
d. Z/R

Answer: c

15. The low power factor of an ac circuit means that
a. it causes less voltage drop in the line
b. it draws more active power
c.it draws less line current
d. it draws more reactive power

Answer: d

16. The impedance of circuit is given by 15.5∠-30 Ω. It means that the circuit is
a. capacitive
b. inductive
c. purely resistive
d. none of the above

Answer: c

17. In RLC series circuit, the inductive reactance is 10 Ω and capacitive reactance is 15 Ω. The total reactance of the circuit is
a. 25 Ω
b. 18.03 Ω
c. 5 Ω
d. 1.5 Ω

Answer: c

18. In series RL circuit, R = 5 Ω, X_L = 10 Ω and X_C = 15 Ω. If this circuit is connected to a voltage source v = 100 sin (314t + 30) V, the rms value of the current will be
a. 14.14 A
b. 10 A
c. 5 A
d. 3.33 A

Answer : b

19. An alternating voltage of 80+j60 V is applied to a circuit and the current flowing is 4-j2 A. Find impedance of circuit.
a. 22.37 Ω
b. 23.27 Ω
c. 21.88 Ω
d. 27.22 Ω

Answer: a

20. An alternating voltage of 80+j60 V is applied to a circuit and the current flowing is 4-j2 A. Find power factor of circuit.
a. 0.5 lag

b. 0.447 lead
c. 0.447 lag
d. none of the above
Answer: c

21. The voltage applied to a circuit is e =100 sin (ωt+30) and the current flowing in the circuit is i = 15 sin (ωt+60). Determine impedance of the circuit.
a. 6.67 Ω
b. 5.57 Ω
c. 7.67 Ω
d. 1.67 Ω

Answer: a

22. The voltage applied to a circuit is e =100 sin (ωt+30) and the current flowing in the circuit is i = 15 sin (ωt+60). Determine resistance of the circuit.
a. 6.67 Ω
b. 5.77 Ω
c. 7.67 Ω
d. 1.67 Ω

Answer: b

23. A resistor of 20 Ω, inductor of 0.005 H and capacitor of 50μF are connected in series. A supply voltage 230 V, 50 Hz is connected across the series combination. Calculate inductive reactance.
a. 16.67 Ω
b. 15.71 Ω
c. 17.67 Ω
d. 14.67 Ω

Answer: b

24. A resistor of 20 Ω, inductor of 0.005 H and capacitor of 50μF are connected in series. A supply voltage 230 V, 50 Hz is connected across the series combination. Calculate capacitive reactance.
a. 53.67 Ω
b. 55.71 Ω
c. 63.67 Ω
d. 57.67 Ω

Answer : c

25. Two impedances $Z_1 = 40\angle 30$ and $Z_2 = 30\angle 60$ are connected in series across a single phase 230 V, 50 Hz supply. Calculate the current drawn
a. 4.3 A
b. 2.3 A
c. 3.4 A
d. 5.0 A

Answer: c

26. A coil having a impedance of $50.39\angle 7.16$ is connected in parallel with capacitor having impedance of $127.32\angle -90$. If supply voltage is 200 V, single phase, 50 Hz. Calculate current in the coil.
a. $4.47\angle 7.16$ A
b. $5.57\angle 8.16$ A

c. 4.97∠90 A
d. 3.97∠-7.16 A

Answer: d

26. A coil having a impedance of 50.39∠7.16 is connected in parallel with capacitor having impedance of 127.32∠-90. If supply voltage is 200 V, single phase, 50 Hz. Calculate current in the capactor.
a. 4.47∠90 A
b. 5.57∠8.17 A
c. 4.97∠90 A
d. 1.57∠90 A

Answer: d

27. An impedance of (7+j5) Ω is connected in parallel with another impedance of (10-j8) Ω across a 230 V, 50 Hz supply. Calculate admittance of the circuit.
a. 0.16∠-7.04 mho
b. 0.16∠7.04 mho
c. -0.16∠7.04 mho
d. none of the above

Answer: b

28. Resonance occurs in series RLC circuit if following condition is satisfied.
a. $X_L > X_C$
b. $X_L < X_C$
c. $X_L = X_C$
d. $X_L \neq X_C$

Answer: c

29. Current of circuit at resonance is
a. Maximum
b. Minimum
c. Unity
d. zero

Answer: a

30. A series RLC circuit has following parameter values: R = 10 Ω, L = 0.01 H and C = 100 μF. Calculate resonant frequency.
a. 159.15 Hz
b. 169.15 Hz
a. 179.15 Hz
a. 150.15 Hz

Answer: a