

2025 END OF SEMESTER EXAMS – APPLIED ELECTRICITY 1

OBJECTIVE TEST (1 HOUR)

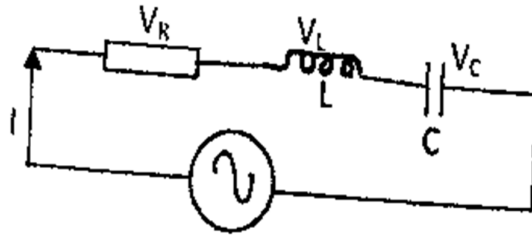
[50 marks]

Answer **all** question in this section.

Each question is followed by four (4) letter **A** to **D**. Find the **correct** option for **each** question and shade in pencil on your answer sheet the answer space which bears the same letter as the option you have chosen.

1. Which of the following is not true of a series RLC circuit at resonance?
A. $X_L = X_C$ B. $\omega = \sqrt{LC}$ C. $Z = R$ D. $\omega = 1/\sqrt{LC}$
 2. The hysteresis loss of a transformer is proportional to
A. Square of supply frequency B. Supply frequency
C. Square of supply voltage D. Supply voltage
 3. Which of the following transformer losses vary with load?
A. Eddy current loss B. Hysteresis loss C. Leakage flux loss D. Copper loss
 4. The maximum value obtained by a waveform over half a cycle is known as its
A. r.m. s value B. peak value C. average value D. form factor
 5. The angular frequency of a signal that has a frequency of 50 Hz is
A. 50.0rad/s B. 100.0rad/s C. 314.2rad/s D. 628.4rad/s
 6. Transformers are used to
A. Step up or step down a.c. voltage B. Step up or step down a d.c. voltage
C. Convert a.c. to d.c. D. Convert d.c. to a.c.
 7. One feature of an autotransformer is that it
A. Is a delta connection B. is star connection
C. has double winding D. has a single winding
- A generator supplies 10KW at 11KW to the primary of a transformer. The secondary current of the transformer is 25.5A. Use this information to answer questions 8 to 10.*
8. The secondary voltage of the transformer is
A. 10V B. 11V C. 392V D. 415V
 9. The transformer turns ration is
A. 28 : 1 B. 25.5 : 1 C. 27.5 : 1 D. 1 : 1
 10. The primary current of the transformer is
A. 0.91A B. 1.10A C. 2.55A D. 25.50A
 11. The peak-to-peak value of a sinusoidal waveform is
A. 0.637 x peak value B. 0.707 x peak value
C. 1.110 x peak value D. 2.00 x peak value
 12. The frequency of a sine wave of period 1 microsecond ($1\mu S$) is
A. 0.1 kHz B. 1.0 KHz C. 0.1 MHz D. 1.0 MHz

Use the figure below to answer questions 13 and 14



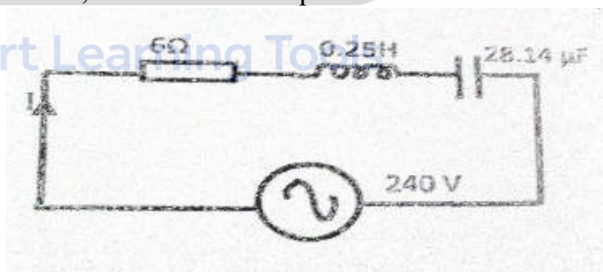
13. The impedance at resonance is
 A. Zero B. infinite C. maximum D. minimum
14. Which of the following is true of the circuit at resonance?
 A. V_L and V_C are in phase B. V_L is at maximum
 C. V_R and V_C are in phase D. V_R is at maximum
15. In a series resonance RLC alternating current circuit, the
 A. Current in minimum B. impedance is maximum
 C. impedance is zero D. current is maximum
16. The transformer oil is mainly used for
 A. Voltage regulation B. lubrication C. protection D. cooling
17. The number of turns in the secondary windings of a 3600/120V transformer with 900 turns in its primary winding is
 A. 4 B. 30 C. 120 D. 480
18. A characteristic of a series RLC resonance circuit is
 A. Maximum circuit B. $X_L > X_C$ C. maximum impedance D. maximum resistance
19. The Q- factor of a series RLC resonance circuit is defined as the ratio of
 A. Stored energy to the dissipated energy B. Stored energy to amplified energy
 C. Dissipated energy to amplified energy D. Dissipated energy to stored energy
20. The inductive reactance of a series RLC resonance circuit is 56.9Ω . The capacitive reactance of the circuit is
 A. 0.569Ω B. 56.9Ω C. $56,900\Omega$ D. $56,000\Omega$
21. The number of wires in a low tension three phase distribution system with the provision for street lightening is
 A. 2 B. 3 C. 4 D. 5
22. In a star connected load, phase voltage equals
 A. Line voltage B. line voltage on square root of three
 C. twice the line voltage D. half the line voltage
23. True power is measured in
 A. Watt-hour B. volt-ampere C. volt-ampere reactance D. watt

24. In a lagging power factor circuit, the reactive component is referred to as
 A. KVA B. KW C. KWh D. KVA_R
25. The purpose of laminating the core of a transformer is to minimize loss
 A. Vibration B. copper loss C. hysteresis loss D. eddy current
26. The circuit load that draws higher current operates at
 A. Unity power factor B. power factor less than unity C. high frequency D. anti-phase
27. The flow of electrons is known as
 A. Power B. voltage C. current D. Energy
28. The efficiency of a transformer is expressed as
 A. $\frac{\text{output} + \text{losses}}{\text{input}} \times 100$ B. $\frac{\text{input}}{\text{output}} \times 100$
 C. $(1 - \frac{\text{losses}}{\text{output}}) \times 100$ D. $(1 - \frac{\text{losses}}{\text{input}}) \times 100$
29. Power factor correction is achieved using a
 A. Resistor B. inductor C. diode D. capacitor

Use the figure below to answer questions 30 and 31

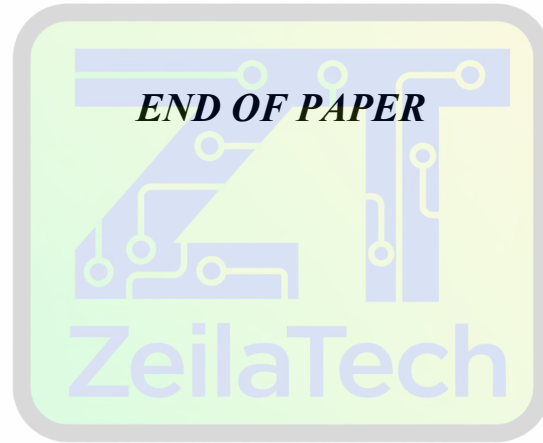
30. The circuit impedance Z is given by
 A. $R^2 + X_L^2 - X_C^2$ B. $R^2 + X_L^2 + X_C^2$
 C. $\sqrt{[R^2 - (X_L + X_C)^2]}$ D. $\sqrt{[R^2 + (X_L - X_C)^2]}$
31. The voltage V_L
 A. is in phase with V_R B. leads current by 90°
 C. lags V_C by 90° D. is in phase with source voltage E

The figure below is an RLC circuit, use it to answer questions 32 and 33.



32. The maximum current that can flow in the circuit is
 A. 6.95 A B. 8.45 A C. 33.05 A D. 40.00 A
33. Maximum current will flow in the circuit at a frequency of
 A. 50 Hz B. 60 Hz C. 80 Hz D. 120 Hz
34. In an alternating circuit, if the current leads the voltage by 90° then the circuit is
 A. Capacitive B. Resistive C. Inductive D. Active
35. In a series generator, the only current flowing in the field equals
 A. Armature current B. half the armature current
 C. twice the armature current D. 0.707 of the armature current

47. An advantage of an auto-transformer is that:
A. it gives a high step-up ratio B. iron losses are reduced
C. copper loss is reduced D. it reduces capacitance between turns
48. A 1 kV/250V transformer has 500 turns on the secondary winding. The number of turns on the primary is:
A. 2000 B. 125 C. 1000 D. 250
49. The core of a transformer is laminated to:
A. limit hysteresis loss
B. reduce the inductance of the windings
C. reduce the effects of eddy current loss
D. prevent eddy currents from occurring
50. The power input to a mains transformer is 200W. If the primary current is 2.5A, the secondary voltage is 2V and assuming no losses in the transformer, the turns ratio is:
A. 40:1 step down B. 40:1 step up
C. 80:1 step down D. 80:1 step up



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