

OBJECTIVE QUESTION BANK
BE III Sem: Electrical Engineering
Network Analysis

1. An ideal voltage source has
 - a) **Zero internal resistance**
 - b) Open circuit voltage equal to the voltage on full load
 - c) Terminal voltage in proportion to current
 - d) Terminal voltage in proportion to load

2. The circuit in which current has a complete path to flow is called _____ circuit.
 - a) short
 - b) open
 - c) **closed**
 - d) open loop

3. For a voltage source
 - a) Terminal voltage is always lower than source e.m.f.
 - b) **Terminal voltage cannot be higher than source e.m.f.**
 - c) The source e.m.f. and terminal voltage are equal
 - d) None of these

4. If the voltage-current characteristics is a straight line through the origin, then the element is said to be?
 - a) **Linear element**
 - b) Non-linear element
 - c) Unilateral element
 - d) Bilateral element

5. Kirchhoff's Current Law is applicable to only:
 - a) Close looped Networks.
 - b) Electronics Circuits.
 - c) Electrical Circuits.
 - d) **Junctions in a network.**

6. According to KVL the algebraic sum of all the IR drops and Emfs in any closed loop of a network:
 - a) Dependent on the total voltage supplied.
 - b) Varies according to the type on circuit.
 - c) is always positive,
 - d) **is equal to zero.**

7. If all the resistances in the circuit are one ohm. Find the equivalent resistance between points A and B.
 - a) 1 Ohm
 - b) **0.5 Ohm**
 - c) 2 Ohms
 - d) 1.5 Ohms

8. In the following circuit the total current through the voltage source V_0 , "I" is equal to:
 - a) One Ampere
 - b) Two Ampere
 - c) **Three Ampere**
 - d) Four Ampere

9. Two heaters; both rated 1000 Watt , 250 volt; are connected in series to a 250 voltage , 50 Hz power supply. The total power drawn from the source would be:
- 1000 Watts
 - 500 Watts**
 - 250 Watts
 - 2000 Watts
10. Two light bulbs rates 40 watt and 60 watt are connected in series to the mains power supply. Then.
- Both light will not glow.
 - Both light will glow equally.
 - 60 watt light will glow brighter.
 - 40 watt light will glow brighter.**
11. How many 200W/220 V incandescent lamps connected in series would consume the same amount of power as 100W/ 220V incandescent lamp?
- Not Possible.
 - 4
 - 3
 - 2**
12. certain network consists of large number of ideal linear resistances, one of which is designated as R and two constant ideal sources. The power consumed by R is P1 when only first source is active and P2 when only the second source is active. If both sources are active simultaneously then the power consumed by R is:
- $P1 \pm P2$
 - $\sqrt{P1 \pm P2}$
 - $(\sqrt{P1} \pm \sqrt{P2})^2$**
 - $(P1 \pm P2)^2$
13. The incandescent bulbs rates respectively P1 and P2 for operation at a specific mains voltage are connected in series across the mains in series. Then the total power supplied by the mains to the two bulbs is:
- $(P1P2)/(P1 + P2)$**
 - $\sqrt{(P1 + P2)}$
 - $P1 + P2$
 - $\sqrt{(P1 \cdot P2)}$
14. A network has 4 nodes and 3 independent loops what is the number of branches in the network?
- 5
 - 6**
 - 7
 - 8
15. A network with 10 branches and 7 nodes will have
- 3 loop equations.
 - 4 loop equations.**
 - 7 loop equations.
 - 10 loop equations.
16. In an electrical network to neglect a current source the current source is:
- Open Circuited.**
 - Short Circuited.
 - Replaced by a capacitor.
 - Replaced by an Inductor.

17. A network have 10 nodes and 17 branches. The number of different node pair voltage would be:
- 7
 - 9**
 - 45
 - 10
18. If the number of branches in a network is "B", the number of nodes is "N", and the numbers of dependent loops is "L". Then the numbers of independent node equations will be:
- $N+L-1$
 - $B-1$
 - $B-N$
 - $N-1$**
19. A constant current source supplies 300 mA to a load of 1 kilo ohms. When the load is changed to 2 kilo ohms the current through the load will be:
- 150 mA
 - 300 mA**
 - 600 mA
 - 30 mA
20. To neglect a voltage source, The terminals across source are:
- open circuited.
 - short circuited.**
 - replaced by some resistance.
 - replaced by an inductor.
21. Kirchhoff's laws are valid for
- linear circuits only.
 - passive time invariant circuits.
 - nonlinear circuits only.
 - both linear and non linear circuits,**
22. Kirchhoff's voltage laws are valid for
- IR drop.
 - battery EMF.
 - junction voltage,
 - both "a" and "b".**
23. In the following circuit; what is the total power delivered by the 24v power supply?
- 96 W
 - 114 W
 - 192 W
 - 288 W**
24. When a resistor R is connected to a current source, it consumes a power of 18 watts. When the same R is connected to a voltage source having same magnitude as the current source, the power absorbed by R is 4.5 Watts. The magnitude of the current source and the value of R are:
- $\sqrt{18}$ Amps and 1 Ohms.
 - 3 Amps and 2 Ohms.**
 - 1 Amps and 18 Ohms.
 - 6 Amps and 0.5 Ohms.

25. Superposition theorem is not applicable for:
- voltage calculations.
 - bilateral elements.
 - power calculations.**
 - passive elements.
26. Which of the following theorem is applicable for both linear and nonlinear circuits?
- Superposition theorem.
 - Thevenin's theorem.
 - Norton's theorem.
 - none of these.**
27. A 10 V battery with an internal resistance of 1 Ohms is connected across a non-linear load whose v-i characteristics is given by; $7i = v^2 + 2v$; the current delivered by the battery is:
- 2.5 amps
 - 5 amps**
 - 6 amps
 - 7 amps
28. Maxwell's loop current method of solving electrical networks:
- uses branch currents.
 - utilizes Kirchhoff's voltage law.**
 - is confined to single loop circuits.
 - is a network reduction method.
29. Nodal analysis is based on:
- KCL**
 - KVL
 - both KCL and KVL
 - Law of conservation of energy.
30. In nodal analysis, if there are N nodes in the circuit, then how many equations will be written to solve the network?
- N-1**
 - N+1
 - N
 - N+2
31. Point out the wrong statement: In the node voltage technique of solving networks, choice of reference node does not:
- affect the operation of circuit.
 - change the voltage across any element.
 - alter the PD between any pair of nodes.
 - affect the voltages of various nodes. |**
32. In Thevenin's equivalent of a circuit, the Thevenin Voltage (V_{th}) is :
- Short-circuit terminal voltage.
 - Open-Circuit terminal voltage.**
 - Total voltage available in the circuit.
 - EMF of the battery nearest to the terminal,

33. Consider the following statements on mesh and nodal analysis:
- 1) Networks that contain many series-connected elements, voltage source or meshes having common current sources (Super Mesh) are more suitable for mesh analysis than for nodal analysis.
 - 2) Networks with parallel connected elements, current sources or nodes connected by voltage sources are more suitable for nodal analysis than mesh analysis.
 - 3) A circuit with fewer nodes than meshes is better analysed using mesh analysis, while a circuit with fewer meshes than nodes is better analysed using nodal analysis.
- Which of the statements given are correct?
- a) **1 and 2 only.**
 - b) 2 and 3 only.
 - c) 1 and 3 only.
 - d) 1, 2 and 3.
34. The Thevenin's equivalent resistance R_{th} for the given network along the terminal AB is:
- a) One Ohms
 - b) **Two Ohms**
 - c) Four Ohms
 - d) Infinite Ohms
35. When the power transferred to the load is maximum the efficiency of power transfer is:
- a) 25%
 - b) 75%
 - c) **50%**
 - d) 100%
36. Superposition theorem can be applied only to circuits having
- a) Resistive elements
 - b) Passive elements
 - c) Nonlinear elements
 - d) **Linear bilateral elements**
37. "Any number of current sources in parallel may be replaced by a single current source whose current is the algebraic sum of individual currents and source resistance is the parallel combination of individual source resistances".
- The above statement is associated with
- a) Thevenin's theorem
 - b) **Millman's theorem**
 - c) Maximum power transfer theorem
 - d) None of the above
38. For maximum transfer of power, internal resistance of the source should be
- a) **Equal to load resistance**
 - b) Less than the load resistance
 - c) Greater than the load resistance
 - d) None of the above
39. Application of Norton's theorem to a circuit yields
- a) **Equivalent current source and impedance in series**
 - b) Equivalent current source and impedance in parallel
 - c) Equivalent impedance
 - d) Equivalent current source

40. In Thevenin's theorem, to find Z
- a) All independent current sources are short circuited and independent voltage sources are open circuited
 - b) All independent voltage sources are open circuited and all independent current sources are short circuited
 - c) All independent voltage and current sources are short circuited
 - d) **All independent voltage sources are short circuited and all independent current sources are open circuited**
41. While considering Reciprocity theorem, we consider ratio of response to excitation as ratio of?
- a) voltage to voltage
 - b) current to current
 - c) **voltage to current**
 - d) None of the above
42. "In any linear bilateral network, if a source of e.m.f. E in any branch produces a current I in any other branch, then same e.m.f. acting in the second branch would produce the same current / in the first branch". The above statement is associated with
- a) Compensation theorem
 - b) Superposition theorem
 - c) **Reciprocity theorem**
 - d) None of the above