MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)

## I B.Tech ISemester (MR15 Regulations) Online I Mid Examination
Subject: Basic Electrical and Electronics Engineering

MULTIPLE CHOICE QUESTIONS

1.What will be the resistance if 10 resistors of 10 ohm each is connected in series   [   ]

(A)100 Ω   (B)1 Ω   (C) 0.1 Ω   (D)10 Ω.

2.Resistivity of a wire depends on   [   ]

(A) length   (B) material   (C) cross section area   (D) All of the above.

3. Which of the following is not the same as watt?   [   ]

(A) joule/sec   (B) amperes/volt (C) amperes x volts   (D) (amperes)^2 x ohm.

4.Ohm's law is not applicable to   [   ]

(A) DC circuits (B) high currents (C) small resistors (D) semi-conductors.

5.A wire of resistance R has it length and cross-section both doubled. Its resistance will become

(A) 4 R   (B)2 R   (C) R   (D) R / 4.   [   ]

6.The rating of fuse wire is expressed in terms of   [   ]

(A) Ohms (B) Mhos (C) Amperes   (D) Watts.

7. For maximum transfer of power, internal resistance of the source should be: [   ]

(A) Equal to load resistance   (B) Less than that of the load
(C) More than that of the load   (D) Zero

8.Thevenin's theorem can be applied to network containing   [ ]
(A) Passive elements only   (B) Active elements only

(C) Linear elements only   (D) All of these

9. Which of the following theorems helps in simplifying computations when the load across a circuit is varying?   [   ]
(A) Superposition   (B) Norton's   (C) Thevenin's   (D) Maximum power transfer

10.When maximum power transfer takes place, the efficiency of power transfer of the circuit is
(A) 100%   (B) 75%   (C) 50%   (D) 25%   [   ]

11. The superposition theorem requires as many circuits to be solved as there are: [   ]
(A) Nodes (B) Sources (C) Nodes and Sources   (D) Nodes, Sources and Mesh

12.An ideal voltage source should have: [   ]
(A) Zero source resistance   (B) Infinite source resistance

(C) Terminal voltage is proportional to current
(D) Open-circuit voltage nearly equal to voltage of the load current

13.In which figure the relationship between voltage V and current I is in accordance with Ohm's law ? [   ]
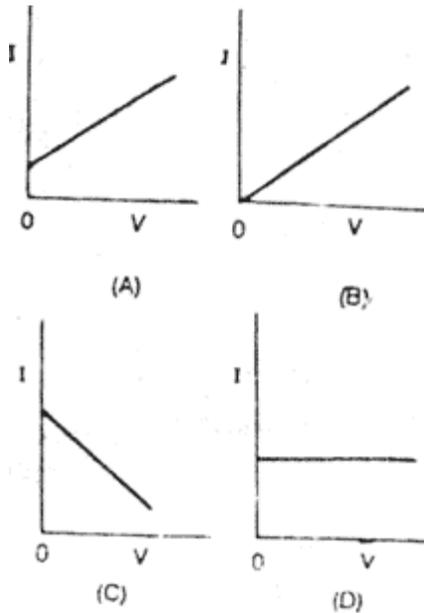
(A) Figure A   (B) Figure B   (C) Figure C   (D) Figure D.

14.A passive element in a circuit is one which [   ]

(A)Receives energy (B) Supplies energy (C) both supplies and receives energy (D) none

15.Unit of electric potential [   ]

(A) Ampere (B) Volts (C) coulomb (D) Volt-ampere

16.If a flux of Φ Weber's links with a coil of N turns , the induced voltage in the coil is given by

(A) N dΦ/dt   (B) –N dΦ/dt   (C) NBlu (D) none   [   ]

17.Whenever there is a relative motion of a coil & a magnetic field, a voltage is induced in the coil. Such a voltage is called [   ]

(A) Statically induced voltage   (B) Dynamically induced voltage

(C) Self-induced voltage   (D) Mutually induced voltage

18.The polarity of the induced voltage is determined by ; [   ]

(A) Ampere's law   (B) Lenz's law   (C) Kirchhoff's law   (D) Right hand rule

19. Two resistors each of 4Ω and 12Ω   are connected in parallel and the parallel combination is connected in series with a 2 Ω   resistor. If this circuit is connected across a 100V supply , the total current drawn is
(A) 50A   (B) 25A   (C)20A   (D)2A   [   ]

20. The energy stored in an inductor of inductance L henry is represented by   [   ]

(A)i^2 L   (B)iL^2 (C)L^2/i   (D) (1/2) Li^2

21. The voltage induced in an inductor of L henry is represented by   [   ]
(A)Li   (B) L/I   (C) L di/dt   (D) None of these

22. Which of these is not an expression for the energy stored in a capacitor?   [   ]
(A) 1/2CV^2 (B) C∫vdv   (C) ∫ pdt   (D) QV^2

23. Which of the elements in the following is not bilateral?   [   ]

(A) Resistor   (B) Inductor   (C) Capacitor   (D) Transistor

24. A node in a network is defined as a   [   ]
(A) Closed path   (B) Junction point of two or more branches

(C) Group of interconnected elements   (D) All of these

25. Which of the following is not a unit of conductance?   [   ]
(A) mho   (B) Siemens   (C) Volt/ampere   (D) Ampere/volt

26. Three capacitors, each of C microfarad are first connected in series and then in parallel. The equivalent capacitance   [   ]
(A) Is greater in the series combination   (B) Is greater in the parallel combination

(C) Is the same in the two combination   (D) None of these

27. Two resistances R_1 and R_2 give combined resistance of 4.5 ohms when in series and 1 ohm when in parallel. The resistances are   [   ]
(A) 3 ohms and 6 ohms   (B) 3 ohms and 9 ohms

(C) 1.5 ohms and 3 ohms   (D) 1.5 ohms and 0.5 ohms

28. A Material having a charge of 12 coloumbs over 6 second what is current flowing through the material

     a) 3 Amps   b)2 Amps   [   ]

     c) 4 Amps   d) 10Amps

29.The Potential Difference between Two terminals of Resistor is 10V, Current flowing is 5A, What is the value of Resistance   [   ]

  a) 2Ω   b) 1.5 Ω

  c) 1.5 Ω   d) None of these

30.Four resistors each of 20Ω are connected in parallel, the total resistance is   [   ]

  a) 80Ω   b) 5Ω

  c) 5Ω   d) None of these

31.One farad is equal to   [   ]

  a) 1Ω   b) 1 V/C

  c) 1C/V   d) None of these

32.Two resistors each of 4Ω and 12Ω are connected in parallel and the parallel combination is connected in series with a 2 Ω resistor. What is the Equivalent Resistance?

  a) 50Ω   b) 5Ω   [   ]

  c) 20Ω   d) 2Ω

33.The unit of resistance is   [   ]

  a) ohms   b) Volts

  c) Amperes   d) Tesla

34. Circuit is defined as   [   ]

  a) Interconnection of Circuit elements with Closed Path

  b) Interconnection of Circuit elements with out any closed path

  c) Interconnection of with out Circuit elements

  d)None of these

35.In Series Connection of elements _____ Parameter is Same   [   ]

  a) Current   b)Voltage

  c) Power   d)None of these

36. In parallel Connection of elements _____ Parameter is Same   [   ]

    a) Current   b) Voltage

    c) Power   d) None of these

37. A Loop in a Circuit is defined as a   [   ]

    a) Closed path   b) Junction point of two or more branches

    c) inter connected elements   d) All of these

38. KCL is applicable at   [   ]

    a) A Junction   b) Resistor

    c) Loop   d) All of these

39. KVL is applicable at   [   ]

    a) A Junction   b) Resistor

    c) Closed Loop   d) All of these

40. Super-Position Theorem is applicable for a   [   ]

    a) Linear Bilateral Network   b) Non- Linear Bilateral Network

    c) Linear Uni-ateral Network   d) All the above

41. Faradays- First law the induced EMF is   [   ]

    a) Dynamically Induced EMF   b) Statically Induced EMF

    c) Eddy EMF   d) None of these

42. Faradays- second law the induced EMF is   [   ]

    a) Dynamically Induced EMF   b) Statically Induced EMF

    c) Eddy EMF   d) None of these

43. The direction of dynamically Induced EMF can be determined with the help of [   ]

    a) Lenz's Law   b) Flemings Left Hand Rule

    c) Flemings Right Hand Rule   d) None of these

44. The direction of statically Induced EMF can be determined with the help of   [   ]

    a) Lenz's Law   b) Flemings Left Hand Rule

    c) Flemings Right Hand Rule   d) None of these

45. Thevenin's Voltage is   [   ]

    a) Open circuit voltage   b) Short Circuit Voltage

    c) Closed Circuit voltage   d) None of these

46. Ohm's Law is Applicable at_____ Conditions   [   ]

    a) Constant Temperature   b) Constant Pressure

    c) Constant Volume   d) None of These

47. The unit of inductance is   [   ]

    a) ohms   b) Volts

    c) Amperes   d) Henry

48. The unit of capacitance is   [   ]

    a) ohms   b) Farads

    c) Amperes   d) Tesla

ANSWERS:

1.A 2.B 3.B 4.D 5.C 6.C 7.A 8.D 9.D 10.C 11.B 12.A 13.B 14. A 15.B 16. B17.B18.B
19.C20.D 21.C 22.D 23D 24.B 25.C 26.B 27.C 28.B 29.A 30.C 31.C 32.B 33.A 34.A 35.A 36.A
37.A 38.A 39.C40.A 41.A 42.B43.C 44.A 45.A 46.A 47.D 48.B

FILL IN THE BLANKS:

1.If 'n' equal capacitors are connected in series then equivalent capacitance is _____

2.The flow of free electrons is called _____

3.If 'n' equal inductors are connected in parallel then, equivalent inductance is_____()

4.The resistivity ρ =_____

5.Conductance G = _____

6._____of voltage required to produce 3 mA of current in a 3 kΩ resistance?

7.You have a resistor across which you measure 25 V, and your ammeter indicates 50 mA of current. What is the value of the resistor in _____kilo ohms

8.When resistances are connected in series, the voltage across all the resistances is _____

9.When resistances are connected in parallel,the current through all the resistances is _____

10. Thevenin's equivalent circuit consists of _____

11.KVL states that In any network, the algebraic sum of _____ across the circuit elements of any closed path (or loop or mesh) is equal to the algebraic sum of the EMF's in the path

12.The limitations of Thevinin's theorem is _____

13.An ideal current source has _____ Internal Resistance

14.A terminal where three or more branches meet is known as_____

15.A closed path made by several branches of the network is known as_____

16.An ideal voltage source has _____Internal Resistance

17.Kirchhoff's law is applicable to_____

18.example of bilateral element_____

19.The inductance of a coil can be increased by_____

20.An inductor stores energy in_____

21.Temperature coefficient of resistance is expressed in terms of_____

22.Resistivity of a wire depends on_____

23.A capacitor stores energy in_____

24.When resistors are connected in series, the current across all the resistors is _____

25.When resistors are connected in parallel, the voltage across all the resistors is_____

26.While applying Thevenin' s theorem, the thevenin 's voltage is equal to_____

27.KCL states that In any network, the algebraic sum of _____ across the circuit elements of any junction is equal to the zero.

28.Twelve 4-Ω resistors connected in series. the Total Resistance is _____

29.Ohm's law V = _____

30.The unit for resistivity $\rho =$_____

31.The unit for electric charge _____

32. Super position theorem is applicable for _____ networks

33. Thevenins Theorem is applicable for _____ networks

34. Maximum Power Transfer Theorem states that maximum power is transferred from source to load when source Resistance is equal to _____

35. Lenz's Law states that the effect opposes the_____

36. Ohm's Law is Applicable at constant _____

37. Work done in moving a unit charge is called_____

38. Faraday's-I st Law induced EMF is called _____ EMF

39. Faraday's-II nd Law induced EMF is called _____ EMF

40. Energy stored by the Inductor is E =_____

41. Energy stored by the Capacitor is E =_____

42. Direction of Dynamically induced EMF Can be determined by _____Rule

43. Polarity of Statically induced EMF Can be determined by _____Rule

44. Current always chooses to flow from _____Potential to _____Potential

45. Resistance of a Conductor mainly depends on _____

46. The Unit for Inductance _____

47. The Unit for Capacitance_____

48. Current division Rule applicable When the Resistors are connected in _____

49. Voltage division Rule applicable When the Resistors are connected in _____

50. How many coulombs of charge flow through a circuit carrying a current of 10A in 1 min is _____

51. Power is defined as the product of voltage and _____

ANSWERS:

1. $1/C_{eq} = 1/C_1 + 1/C_2 + \ldots \ldots 1/C_n$
2. Current
3. $1/L_{eq} = 1/L_1 + 1/L_2 + \ldots \ldots \ldots 1/L_n$
4. R_a/l
5. $1/R$
6. 9V
7. 0.5Ω
8. Different or Not same
9. Different or Not same
10. Thevenin's Voltage and Thevenin's Resistance in series
11. Voltage
12. Applicable for Linear &Bilateral N/w's
13. Infinity
14. Node or Junction
15. Loop
16. Zero
17. Junction/Loop
18. Resistor
19. No-of Turns N
20. Magnetic Field
21. $R_2 = R_1(1 + \alpha(T_2 - T_1)$
22. Length/Area
23. Electric Field
24. Same
25. Same
26. Open circuit Voltage
27. Currents
28. 48Ω
29. IR
30. Ω-m
31. Coulombs
32. Linear bilateral
33. Linear bilateral
34. Load resistance
35. Cause
36. Temperature
37. Voltage or Potential
38. Dynamically Induced
39. Statically Induced
40. $1/2\ LI^2$
41. $1/2\ CV^2$
42. Flemings Right Hand Rule
43. Lenz's Law
44. High ,Low
45. Length, Area, type of Material
46. Henries
47. Farads
48. Parallel
49. Series
50. 10 Coulombs
51. Current

SHORT ANSWER QUESTIONS

1. what is current?

2. what is voltage/Potential?

3. what is OHM'S law?

4. what is KCL?

5. what is KVL?

6. what is resistance?

7. what is inductance?

8. what is capacitance?

9. what is faraday's first laws?

10. what is faraday's second laws?

11. What is lenz's law?

12. what is statically induced E.M.F?

13. what is dynamically induced E.M.F?

14. what is self inductance?

15. what is mutual induction?

16. state superposition theorem.

17. state maximum transfer theorem.

18. state Thevenin's theorem.

19. what is ideal voltage source?

20. what is real voltage source?

21. what is ideal current source?

22. what is real current source?

23. what is linear element?

24. what is bilateral element?

25. what is active element?

26. what is passive element?

27. what if co-efficient of coupling K<1?

28. what is conductance?

29. what is the behavior if direct current is given to inductor?

30. what is the behavior if direct voltage is given to capacitor?

ANSWERS:

1.Rate of flow of Electrons/charge

2.Work done in moving unit charge

3.At Constant Temperature Potential difference across a conductor is Directly Proportional to the current passing through it.

4. At any node, the algebraic sum of currents is zero

5.At any loop, the algebraic sum of voltages is zero

6.It's the property of a material opposes the flow of current/electrons

7.It's the property of Inductor which stores the Energy in magnetic field

8.It's the property of Capacitor which stores the Energy in electric field

9.When ever Conductor Cuts the magnetic field EMF is induced in the conductor

10.The Rate of Change of flux linkages induces EMF in a stationary coil

11.The effect opposes the Cause

12.It's the EMF induced in transformer/Stationary coil

13.It's the EMF induced in a generator /coil which is in motion

14.when ever current flowing in one coil induces EMF/Flux in same coil

15.when ever current flowing in one coil induces EMF/Flux in another coil

16.In a linear bi-lateral network the response in any element is the algebraic sum of responses caused by taking single source at a time/alone

17. The Maximum power is transferred from source to load when source resistance is equal to Load Resistance.

18.In any Linear bi-lateral network can be replaced by a voltage source in series with a resistance between the terminals

19.The source which is having zero internal resistance is called ideal voltage source

20.The source which is having finite internal resistance is called real voltage source

21.The source which is having Infinite internal resistance is called ideal current source

22.The source which is having finite internal resistance is called realcurrent source

23.The element whose V-I Characteristic is linear, Resistor

24.The element which allows Current in both the directions/ways

25.The element which supplies the Energy to the external circuits

26.The element which Receives/Takes the Energy from the external source

27.It acts as weak magnetic field

28.It's the reciprocal of Resistance

29.It acts as a short circuit/V=0

30.It acts as open circuit/I=0

TRUE/FALSE QUESTIONS

1.OHM'S law is applicable only if resistance is constant

2. OHM'S law is applicable only if temperature of conductor is varying

3.In KCL incoming currents is not equal to out going currents

4. KCL is applicable to a mesh

5.KVL is applicable to mesh

6. In series connected resistors equivalent resistance R=R1+R2

7.In parallel connected resistors equivalentresistance R=(R1+R2)/2

8.In Inductor   V=L(di/dt)

9.In Capacitor V=C(di/dt)

10Energy Stored by the Inductor E=1/2(LI^2)

11.Energy Stored by the Capacitor E=1/2(CI^2)

12.Induced EMF is directly proportional to Rate of change of Flux linkages

13.Faraday's law E=Blv sinwt

14.Fleming's Right Hand Rule gives the Direction of Induced EMF

15.When two resistors are connected in series R=R1-R2

16.When two resistors are connected in parallel R=R_1+R_2

17.When two Inductors are connected in parallel L=L$_1$+L$_2$

18.When two Inductors are connected in series L=L$_1$+L$_2$

19.When two Capacitors are connected in parallel R=R$_1$+R$_2$

20.When two Capacitors are connected in series C=(C$_1$*C$_2$ / C$_1$+C$_2$)

21.Superposition theorem is Valid for Linear and bilateral Networks

22.Thevinin's theorem is applicable for Non- Linear and Unilateral Networks

23.Maximum power is transferred from source to load when R$_s$≠R$_L$

24. Dynamically induced EMF Results in Energy Conversion

25.Statically induced EMF involves Rotation of Conductor

26.Induced EMF is maximum when conductor perpendicular to flux lines

27.Induced EMF is maximum when conductor parallel to flux lines

28.Rating of fuse is in AMPS

29. Thermal coefficient of Resistance is Positive for metals

30. Current in a Loop is Constant

ANSWERS:

1.TRUE 2.FALSE 3.FALSE 4.FALSE 5.TRUE 6.TRUE 7.FALSE   8.TRUE 9.FALSE
10.TRUE 11.FALSE 12.TRUE 13.TRUE 14. TRUE 15.FALSE 16.FALSE 17.FALSE
18.TRUE 19.FALSE 20.TRUE 21.TRUE 22.FALSE 23.FALSE 24.TRUE 25.FALSE 26.
TRUE 27.FALSE 28.TRUE 29.TRUE 30.TRUE

MATCH THE FOLLOWING

1.

(i) Resistance	[ ]	a) mho
(ii) Inductance	[ ]	b) Henry
(iii) Capacitance	[ ]	c) Farad
(iv) Conductance	[ ]	d) ohm
(v) Current	[ ]	e) Amps

2.

    (i) KCL   [   ] a)Effect opposes cause
    (ii) KVL   [   ] b) Loop
    (iii) Ohm's Law   [   ] c) Node
    (iv) Lenz's Law   [   ] d) Conductors
    (v) Fleming's Right Hand Rule   [   ] e) Direction

3.

    (i) Passive Element   [   ] a) Battery
    (ii) Active Element   [   ] b)Diode
    (iii) Non-Linear Element   [   ] c)Resistor
    (iv) Time variant   [   ] d) Current
    (v) Rate of flow of charge   [   ] e) Changes With time

4.

    (i) Energy Stored in Capacitor   [   ] a)$1/2LI^2$
    (ii) Energy Stored in Inductor   [   ] b)VI
    (iii)Power dissipated in Resistor   [   ] c)$1/2CV^2$
    (iv) Faraday's Law   [   ] d)$e=-N(d\phi/dt)$
    (v) Coefficient of coupling   [   ] e) $K=M(L_1*L_2)^{1/2}$

5.

    (i) Super-position theorem   [   ] a) V_{TH}, R_{TH}
    (ii) Thevenin's Theorem   [   ] b) $I=I_1+I_2$
    (iii)Maximum Power Transfer Theorem [   ] c)Transformer
    (iv)Statically Induced EMF   [   ] d)Generator
    (v)Dynamically Induced EMF   [   ] e)$R_S=R_L$

6.

    (i) Voltage Division rule   [   ] a)$I_1=I_2+I_3$
    (ii) Current Division rule   [   ] b)$V=V_1+V_2$
    (iii)KCL   [   ] c)$I_2=I*(R_1/R_1+R_2)$
    (iv)KVL   [   ] d)$v_1=v*(R_1/R_1+R_2)$
    (iv)Ohm's Law   [   ] e)$V=IR$

7.

    i)Faraday's Ist Law   [   ] a) Transformer
    ii)Faraday's IInd Law   [   ] b) Generator
    iii)KVL   [   ] c) Node
    iv) KCL   [   ] d) Loop
    v) ohm's Law   [   ] e)Conductor

8.

i) Self Inductance   [   ]   a) K
ii)Mutual Inductance   [   ]   b) L
iii) Coefficient of Coupling   [   ]   c) M
iv) Resistivity   [   ]   d) ρ
v) capacitance   [   ]   e) C

9.

i) Inductance   [   ]   a) ohm
ii) resistance   [   ]   b)henry
iii) Ampere   [   ]   c)Farad
iv) Voltage   [   ]   d) Volts
v)capacitance   [   ]   e) amps

Answers:

1.(i) - d) (ii) - b) (iii) -c) (iv) -a) (v) - e)
2.(i) - c) (ii) - b) (iii) - d) (iv) - a) (v) - e)
3.(i) - c) (ii) - a) (iii) - b) (iv) - e) (v) - d)
4.(i) - c) (ii) - a) (iii) - b) (iv) - d) (v) - e)
5.(i) - b) (ii) - a) (iii) - e) (iv) - c) (v) - d)
6.(i) - d) (ii) - c) (iii) - a) (iv) - b) (v) – e)
7. (i) - b) (ii) - a) (iii) - d) (iv) - c) (v) - e)
8. (i) - b) (ii) - c) (iii) - a) (iv) - d) (v) - e)
9.(i) - b) (ii) - a) (iii) - e) (iv) - d) (v) - c)