BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Technology in Electronics & Communication Engineering

Course Name – Basic Electrical Engineering

Course Code - BELE010201

Semester / Year - Semester I

Time allotted : 85 Minutes Full Marks : 70

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 70=70

1. *(Answer any Seventy)*

(i) Kirchhoff's laws are useful in determining—

a) Current flowing in a circuit
b) EMFs and Voltage drops in a circuit
c) Power in a circuit
d) All of these

(ii) Which, among the following is the correct expression for admittance?

a) Y= Z
b) Y=1/Z
c) Y=Z2
d) Y=1/Z2

(iii) According to Kirchoff's voltage law,

a) The algebraic sum of all the e.m.f's in the circuit is zero
b) Algebraic sum all the voltage drops in the circuit is zero
c) Algebraic sum of e.m.f's plus algebraic sum of voltage drops is equal to zero
d) All of these

(iv) In any network of wires carrying currents, the algebraic sum of all currents meeting at a point is equal to

a) Sum of all the currents
b) Zero
c) Sum of outgoing current
d) Sum of incoming current

(v) In a DC Circuit, Inductive reactance would be_____

a) Equal As in AC Circuits
b) High

c) Extremely high d) Zero

(vi) Kirchhoff's laws are useful in determining——

a) Current flowing in a circuit b) EMFs and Voltage drops in a circuit

c) Power in a circuit d) All of these

(vii) According to Thevenin's theorem, any bilateral network can be replaced by a network with——

a) An independent current source in parallel to the equivalent resistance b) An independent voltage source in series with the equivalent resistance

c) An independent voltage source in parallel to the resistance d) None of these

(viii) Identify the passive elements

a) Voltage source b) Current source

c) Transistor d) Inductor

(ix) Voltmeter has a _____resistance

a) very small b) 1 ohm

c) 0 ohm d) very high

(x) Internal resistance of an ideal voltage source is

a) 0 b) 1

c) infinity d) None of these

(xi) Two bulbs B1 100 W, 200 V and B2 40 W, 200 V are connected in series across 200 V battery, the total circuit resistance will be

a) 1000 ? b) 400 ?

c) 1400 ? d) 135 ?

(xii) Electrical Appliances are not connected in series because

a) Series circuit is complicated
b) Power loss is more
c) Appliances have different current ratings
d) None of these

(xiii) Brushes are always placed on---------- , in order to achieve sparkles commutation?

a) GNA
b) MNA
c) either GNA or MNA
d) None of these

(xiv) Resistance of a wire is directly proportional to its

a) Diameter
b) Area of cross section
c) Length
d) All of these

(xv) If three resistance (R1, R2 & R3) are connected in series then

a) V = IR1 + IR2 + IR3
b) V = I/R1 + I/R2 + I/R3
c) I = VR1 + VR2 + VR3
d) I = V/R1 + V/R2 + V/R3

(xvi) Three resistance 14.5 ?, 25.5 ? and 60 ? are connected in series across 200 V. What will be the voltage drop across 14.5 ?

a) 29 V
b) 13.5 V
c) 14 V
d) 18 V

(xvii) Internal resistance of an ideal current source is

a) 0
b) 1
c) infinity
d) None of these

(xviii) Ammeter has a _____resistance

a) very small
b) 1 ohm
c) 0 ohm
d) very high

(xix) Base of BJT is:

a) Lightly doped
b) Heavily doped

c) Moderately doped
d) Not doped

(xx) RMS value = ___ x Maximum value

a) 0.636
b) 0.85
c) 0.607
d) 0.707

(xxi) Transformers are rated in:

a) KW
b) MW
c) KVA
d) KVAR

(xxii) Two wattmeter method of power measurement is suitable for:

a) balanced load only
b) unbalanced load
c) both balanced and unbalanced load
d) delta connected load

(xxiii) Resonant frequency of an ac series circuit is:

a) 1/2?(LC)1/2
b) 1/4?(LC)1/2
c) 1/4?lc
d) 1/2?LC

(xxiv) Synchronous speed of a 3 phase, 4 pole, 50Hz induction motor is

a) 1500 rpm
b) 1440 rpm
c) 3000 rpm
d) 2880 rpm

(xxv) The time taken by an alternating quantity to complete one cycle

a) Time period
b) Frequency
c) Angular velocity
d) Time constant

(xxvi) The power factor of pure resistive circuit is

a) zero
b) leading
c) lagging
d) none of these

(xxvii) Energy stored in inductor is

a) W = (1/4)LI2
b) W = (1/2)LI2
c) W = (1/2)L2I
d) W = (1/2)L2I2

(xxviii) The power- factor at resonance in R-L-C circuit is

a) zero.
b) unity.
c) 0.5 lagging.
d) 0.5 leading

(xxix) The input of an ac circuit having p.f. of 0.8 lagging is 20 kVA. the power drawn by the circuit is _____ kW.

a) 12
b) 20
c) 16
d) 8

(xxx) The r.m.s. value of half wave rectified sine wave is 200 V. the r.m.s. value of full wave rectified ac. will be

a) 282.8
b) 141.4
c) 111
d) 100

(xxxi) Which of the following statements pertains to resistors only?

a) can dissipate considerable amount of power
b) can act as energy storage devices
c) connecting them in parallel increases the total value
d) oppose sudden changes in voltage

(xxxii) 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

(xxxiii) In a series R-L-C- circuit at the resonant frequency the

a) current is maximum
b) current is minimum

c) impedance is maximum
d) voltage across c is minimum

(xxxiv) If a sinusoidal wave has frequency of 50 hz with 30 Ar.m.s. current which of the following equation represents this wave?

a) 42.42 sin 314 t
b) 60 sin 25 t
c) 30 sin 50 t
d) 84.84 sin 25 t

(xxxv) The apparent power drawn by an a.c. circuit is 10 kVA and reactive power is 8 kVAR. The active power in the circuit is

a) 4 kW
b) 6 kW
c) 8 kW
d) 16 Kw

(xxxvi) The unit of inductive reactance is

a) Ohm
b) Mho
c) Farad
d) henry

(xxxvii) Which of the following does not change in an ordinary transformer

a) Frequency
b) Voltage
c) Current
d) None of these

(xxxviii) In a 5 kV / 400V, 75 kVA single phase transformer, the current flowing in the primary winding of transformer is 10A. What will be the current flowing in the secondary winding?

a) 100A
b) 120A
c) 125A
d) 130A

(xxxix) The power transformer is a constant

a) voltage device
b) current device
c) power device
d) main flux device

(xl) A transformer has

a) two winding
b) one winding
c) no winding
d) None of these

(xli) A transformer has voltage rating of 220/110 volt. It is
a) step-up transformer
b) step-down transformer
c) both a and b
d) None of these

(xlii) A transformer has voltage rating of 110/220 volt. It is
a) step-up transformer
b) step-down transformer
c) both a and b
d) None of these

(xliii) Which one of the following has highest efficiency
a) generator
b) motor
c) induction motor
d) transformer

(xliv) Input power and output power remains constant in
a) generator
b) motor
c) induction motor
d) transformer

(xlv) Which one of the following can not operate in d.c.
a) generator
b) transformer
c) motor
d) either of a,b,c

(xlvi) What is the condition for which maximum efficiency will occur in transformer
a) core loss = copper loss
b) copper loss = 0
c) core loss = 0
d) none of these

(xlvii) Which one of the following is fixed loss
a) core loss
b) copper loss
c) both a and b
d) none of these

(xlviii) What is the mechanical power developed by a DC series motor is maximum?

a) Back Emf is equal to half the applied voltage.
b) Back Emf is equal to applied voltage.
c) Back Emf is equal to zero.
d) None of these

(xlix) Hysteresis loop represents the area of

a) copper loss
b) eddy current loss
c) hysteresis loss
d) total iron losses

(l) The Emf induced in the dc machine armature winding is

a) AC
b) DC
c) AC and DC
d) none of these

(li) A DC generator without Commutator is a

a) AC generator
b) DC motor
c) DC generator
d) Induction motor

(lii) In DC machine yoke offers

a) mechanical protection to the machine
b) flux path completion
c) produce working flux
d) both A and B

(liii) In DC macines brushes are used for

a) collecting of current without any sparkings
b) collecting of voltage
c) reduce eddy current loss
d) convert ac armature current in to dc

(liv) DC machine windings are

a) full pitched
b) short pitched
c) either of these
d) None of these

(lv) Lap winding is preferred for which type of machines?

a) low current and low voltage
b) high current and high voltage
c) high current and low voltage
d) low current and high voltage

(lvi) Bridge rectifier is an alternative for

a) Full wave rectifier
b) Peak rectifier
c) Half wave rectifier
d) None of these

(lvii) In a BJT

a) The base region is sandwiched between emitter and collector
b) The collector is sandwiched between base and emitter
c) The emitter region is sandwiched between base and collector
d) None of these

(lviii) When a reverse bias is applied to a diode, it will

a) Raise the potential barrier
b) Lower the potential barrier
c) Increases the majority-carrier a current greatly
d) None of these

(lix) The arrow direction in the diode symbol indicates

a) Direction of electron flow.
b) Direction of hole flow (Direction of conventional current)
c) Opposite to the direction of hole flow
d) None of these

(lx) If T is the time period for a chopper circuit and ? is its duty cycle, then the chopping frequency is

a) Ton/?
b) Toff/?
c) ?/Toff
d) ?/Ton

(lxi) The load voltage of a chopper can be controlled by varying the

a) duty cycle
b) firing angle

c) reactor position
d) extinction angle

(lxii) A step - down choppers can be used in

a) Electric traction
b) Electric vehicles
c) Machine tools
d) All of these

(lxiii) The average value of the output voltage in a step - down dc chopper is given by

a) V 0 = V s
b) V 0 = D V s
c) V 0 = V s / D
d) V 0 = V s / (1 - D)

(lxiv) When the diode is forward biased, it is equivalent to

a) An off switch
b) An On switch
c) A high resistance
d) None of these

(lxv) The capacitance of a reverse biased PN junction

a) Increases as reverse bias is increased
b) Decreases as reverse bias is increased
c) Increases as reverse bias is decreased
d) Is insignificantly low

(lxvi) Active power in 3 phase circuit is:

a) ?3 VLIL Cos?
b) 3 VLIL Cos?
c) ?2 VLIL Cos?
d) 2 VLIL Cos?

(lxvii) CT is used for measuring

a) Voltage
b) Frequency
c) Power factor
d) Alternating current

(lxviii) Fuse wire should possess

a) High specific resistance and high melting point
b) High specific resistance and low melting point
c) Low specific resistance and low melting
d) Low specific resistance and high melting

point point

(lxix) Best practicable material for a fuse wires is

a) Aluminium b) Copper

c) Iron d) Tin

(lxx) Using a high current fuse in a low current appliance is very

a) safe b) dangerous

c) required d) complicated