Subject: - Basic Electricals and Electronics (22531)

SYLLABUS

Chapter No.	Name of chapter	Marks With Option
1	Electric and magnetic Circuits	10
2	A.C. circuits	18
3	Transformer and single phase induction motors	18
4	Electronic components and signal	18
5	Diodes and applications	18
6	Bipolar junction transistor	14
	Total Marks :-	96

BOARD THEORY PAPER PATTERN FOR BEE (22310)

Section- A		
Q.1		**Attempt any FIVE** **5*2=10**
	a)	Define permeability
	b)	Define MMF
	c)	Define form factor of an alternating quantity.
	d)	Define frequency and time period of an alternating quality
	e)	Define transformation ratio of transformer.
	f)	State the EMF equation of a 1ϕ transformer and state the meaning of each term used.
Q.2		**Attempt any THREE** **3*4=12**
	a)	Draw and explain B – H curve.
	b)	Draw a balanced 3-phase star connected load. Show various line and phase values and also state the relationship between them.
	c)	Explain the working principle of 1ϕ transformer.
	d)	Explain the working principle of 1ϕ motor with a neat diagram.
Q.3		**Attempt any TWO** **2*6=12**
	a)	State and explain Faraday's laws of electromagnetic Induction.
	b)	An inductance of 0.1H and a resistance of 50Ω are connected in series across a 220 V, 50 Hz AC supply. Determine : (i) Impedance (ii) Current (iii) Power factor (iv) Power Consumed
	c)	Derive the EMF equation of a 1ϕ transformer.
Section-B		
Q.4		**Attempt any FIVE** **5*2=10**
	a)	Define Active component. Give two examples.

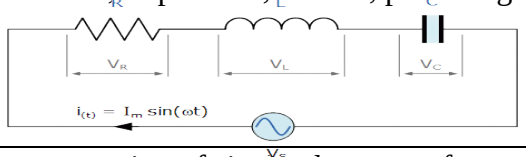
	b)	Draw the symbol of PN-junction diode and give two applications.
	c)	Define PIV.
	d)	Draw the symbol of ideal voltage source and ideal current source.
	e)	Define α and β of a transistor.
	f)	Draw the symbols of PNP and NPN transistor.
Q.5		**Attempt any THREE** **3*4=12**
	a)	Define amplitude and phase of a sinusoidal quantity.
	b)	Explain the constructional details of LED
	c)	Explain zener diode as a voltage regulator.
	d)	Find the value of resistor from the given colour code : (i) Red Red Red Gold (ii) Blue Orange Green Silver
	e)	Explain with neat diagram how transistor can be used as a switch.
Q.6		**Attempt any TWO** **2*6=12**
	a)	Differentiate between analog and digital ICs.
	b)	Explain the working of half wave rectifier with suitable diagram.
	c)	Draw the diagram of transistor operating regions.

CLASS TEST - I

PAPER PATTERN

Syllabus:-

Unit No.	Name of the Unit	Course Outcome (CO)
1	**Electric and magnetic Circuits**	**CO-310.1**
2	**A.C. circuits**	**CO-310.2**
3	**Transformer and single phase induction motors**	**CO-310.3**

Q.1	**Attempt any FOUR4*2=8Marks**	**Course Outcome (CO)**
a)	Define magnetic flux and permeability.	**CO-310.1**
b)	State the types of transformer based on construction.	**CO-310.3**
c)	Define frequency and instantaneous value for AC signal	**CO-310.2**
d)	State Fleming's right hand rule.	**CO-310.1**
e)	What is Inductive reactance and capacitive reactance?	**CO-310.2**
f)	Give any two applications of capacitor start and run motor,	**CO-310.3**
Q.2	**Attempt any THREE3*4=12 Marks**	
a)	A coil of 500 turns and resistance 20ohm is wounded on iron ring of peripheral 50cm, area of 4cm2. It is connected to 24v DC. Relative permeability is 800. Find MMF, magnetizing force, flux, and reactance.	**CO-310.1**
b)	Calculate reactance, impedance, current, phase angle for RLC Circuit. 	**CO-310.2**
c)	Explain the construction of single phase transformer.	**CO-310.3**
d)	Explain the working of shaded pole induction motor.	**CO-310.3**

CLASS TEST - II

PAPER PATTERN

Syllabus:-

Unit No.	Name of the Unit	Course Outcome (CO)
4	**Electronic components and signal**	CO-310.4
5	**Diodes and applications**	CO-310.5
6	**Bipolar junction transistor**	CO-310.6

Q.1	**Attempt any FOUR** 4*2=8Marks	Course Outcome (CO)
a)	List the passive component	CO-310.4
b)	Define doping and state the types of doping	CO-310.5
c)	Give the classification of inductor	CO-310.4
d)	Draw symbol of PN diode, zener diode, LED, photo diode	CO-310.5
e)	Draw common collector configuration of BJT.	CO-310.6
f)	Draw bridge full wave rectifier with shunt capacitor filter.	CO-310.4
Q.2	**Attempt any THREE** 3*4=12 Marks	
a)	Find value of following capacitor: i)3k3 ii)10k iii)103 iv) Brown Red Orange Gold	CO-310.4
b)	Explain the working of full wave bridge rectifier with its circuit diagram and input output waveforms.	CO-310.5
c)	Derive relation between α and β.	CO-310.6
d)	Explain the working of diode in reverse bias condition.	CO-310.5

COURSE OUTCOME
(CO)

COURSE:- Basic Electric and Electronics Engineering (22310) **PROGRAMME: -E&TC**

CO. NO	Course Outcome
CO-310.1	Use principles of electric and magnetic circuit to solve engineering problem.
CO-310.2	Determine voltage and current in AC circuit.
CO-310.3	Connect transformers and electric motors for specific requirement.
CO-310.4	Identify electronic component in electronic circuit.
CO-301.5	Use electronic components safely.
CO-301.6	Use relevant electronic protective devices safely.

1. Electric and magnetic Circuits

Position in Question Paper **Total Marks-08**

Q.1. a) 2-Marks.
Q.1. c) 2-Marks.
Q.2. a) 4-Marks.
Q.3. a) 4-Marks.

Descriptive Question

1. Define magnetic flux &magnetic flux density permeability, magnetic field strength.
2. State any similarities between electric CKT &magnetic CKT
3. State Fleming`s right hand rule
4. Explain mutually induced EMF
5. Draw B-H curve & explain it
6. Define mutual inductance
7. Define coefficient of coupling
8. Define permeability
9. State faraday's laws of electromagnetic induction.
10. A coil of 500 turns and resistance 20ohm is wounded on iron ring of peripheral 50cm, area of 4cm2. It is connected to 24v DC. Relative permeability is 800. Find MMF, magnetizing force, flux, and reactance.
11. What is practical importance of hysteresis loop?
12. State the factors affecting hysteresis loop.
13. Compare EMF and MMF.

MCQ Question

(Total number of Question=Marks*3=8*3=24)

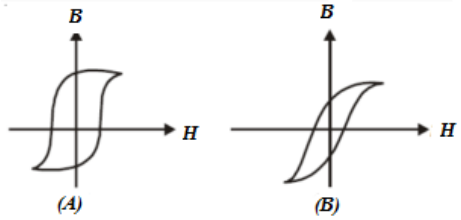
Note: Correct answer is marked with **bold.**

1. The _____ is responsible for the current to flow in a closed circuit
   a) Electric charge
   b) Potential difference
   c) Resistance
   d) All of the above
2. Resistance of a wire is directly proportional to its _____
   a) Length
   b) Diameter
   c) Area of cross section
   d) All of the above
3. Ohm's law is applicable to _____
   a) Semiconductors
   b) Vacuum tubes
   c) Carbon resistors
   d) None of these
4. Reciprocal of resistance is called _____
   a) Resistivity
   b) Conductance
   c) Resonance
   d) None of the above
5. Magnetic field lines form _____ loops from pole to pole
   a) Open
   b) Closed
   c) Branched
   d) Either closed or branched
6. A passive network
   a) Has no current source
   b) Has no e.m.f. source
   c) Has neither of the above
   d) Has either of the above

7. In the circuit given below the power factor will be
   a) Lagging
   b) Leading
   c) Zero
   d) Unity

8. For which of the following is magnetic susceptibility negative?
   a) Paramagnetic and Ferromagnetic materials
   b) Paramagnetic Materials only
   c) Ferromagnetic Materials only
   d) Diamagnetic Materials

9. he Hysteresis loops for two magnetic materials A and B are given below:



These materials are used to make magnets for transformer core, electric generators and electromagnet core. Which of the following is true about the given magnets?

a) A for transformers and B for electric generators
b) A for electric generators and transformers
c) B for electromagnets and generators
d) A for electromagnets and B for electric generators

10. Which of the following is the unit of magnetic flux density?

a) Weber/meter^2
b) Tesla
c) Newton/ampere-metre
d) All of the above

11. The magnetism of a magnet is due to

a) earth
b) cosmic rays
c) due to pressure of big magnet inside the earth
d) spin motion of electrons

12. The magnetic field at a point x on the axis of a mall bar magnet is equal to the field at a point y on the equator of the same magnet. The ratio of the distances of x and y from the centre of the magnet is

a) $2^{-1/3}$
b) $2^{1/3}$
c) 2^3
d) 2^{-3}

13. Which of the following materials is the most suitable for making a permanent magnet?

a) Soft Iron
b) Nickel
c) Copper
d) Steel

14. A sensitive magnetic field instrument can be effectively shielded from the external magnetic field by placing it inside which of the following materials?

a) Plastic Material
b) Teak Wood
c) Soft Iron of high permeability
d) A metal of high conductivity

15. Which of the following statements is true about magnetic field intensity?

a) Magnetic field intensity is the number of lines of force crossing per unit volume.
b) Magnetic field intensity is the number of lines of force crossing per unit area.
c) Magnetic field intensity is the magnetic induction force acting on a unit magnetic pole.
d) Magnetic field intensity is the magnetic moment per unit volume.

16. What happens to the magnetic needle kept in a non-uniform magnetic field?

a) It experiences force but not torque
b) It experiences torque but not force
c) It experiences both force and torque

d) It neither experiences force nor torque

17. What happens to the magnetic moment if a hole is made at the centre of a bar magnet?

a) Decreases
c) Not a change
b) Increases
d) None of the above

18. Which of the following statements is true about magnetic lines of force?

a) Magnetic lines of force are always closed.
b) Magnetic lines of force always intersect each other.
c) Magnetic lines of force tend to crowd far away from the poles of the magnet
d) Magnetic lines of force do not pass through the vacuum.

19. What happens to the MMF when the magnetic flux decreases?

a) Increases
c) Remains constant
b) Decreases
d) Becomes zero

20. What is MMF?

a) Magnetic Machine Force
c) Magnetic Motion Force
b) Magneto motive Force
d) Magnetomotion Force

21. The equivalent of the current I in magnetic ohm's law is?

a) Flux
c) MMF
b) Reluctance
d) Resistance

22. An air gap is usually inserted in a magnetic circuits to

a) Increase m.m.f.
c) Prevent saturation
b) Increase the flux
d) None of the above

23. Permeability in a magnetic circuit corresponds to .....in an electric circuit

a) Resistance
c) Conductivity
b) Resistivity
d) Conductance

24. In a magnetic material hysteresis loss takes place primarily due to

a) Rapid reversals of its magnetisation
b) Flux density lagging behind the magnetising force
c) Molecular friction
d) It high retentivity

25. The property of a material which opposes the creation of magnetic flux in it is known as

a) Reluctivity
c) Permeance
b) Magnetomotive force
d) Reluctance

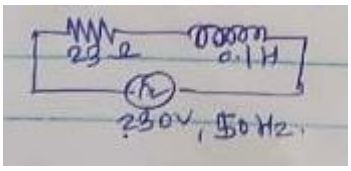
2. AC Circuits

Position in Question Paper **Total Marks-12**

Q.1. b) 2-Marks.
Q.1. d) 2-Marks
Q.2. c) 4-Marks.
Q.4. c) 4-Marks.
Q.5. b) 4-Marks.
Q.6. b) 4-Marks

Descriptive Question

1. Define cycle, time period, instantaneous value, frequency
2. Define inductive reactance and capacitive reactance
3. Calculate:-1. Reactance 2. Impedance 3.current 4.phase angle for following circuit.



4. For series RC CKT: draw CKT dia , phase dia , wave form of vlty and current, impedance triangle
5. A coil of 20ohm resistance and 0.2 H inductance is connected across 230v, 50hz supply. Find impedance, power factor, current, active power.
6. Define active power, reactive power, and apparent power.
7. Draw and explain circuit diagram of RC circuit with phasor diagram.
8. Draw and explain circuit diagram of RL circuit with phasor diagram.
9. Draw and explain circuit diagram of RLC circuit with phasor diagram.
10. Draw and explain circuit diagram of purely resistive circuit with phasor diagram.
11. Draw and explain circuit diagram of purely capacitive circuit with phasor diagram.
12. Draw and explain circuit diagram of purely inductive circuit with phasor diagram.

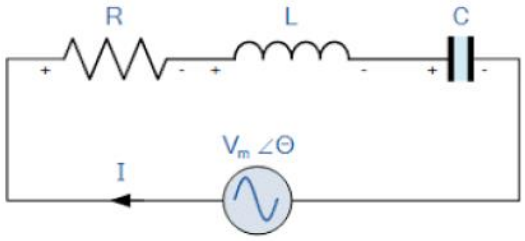
13. An AC voltage v(t)=230 sin 314 vlt is applied to circuit, calculate angular frequency, frequency, RMS value, average.
14. Compare star connection and delta connection.
15. Define line vlotage and phase voltage.
16. Compare single phase system and three phase system.
17. Derive relation between star connected load and delta connected load.
18. State any four advantages of polyphase system.
19. A balanced 3 phase delta connected load consists of three resistances each of 4 ohms connected 400 vlts, 3 phase, 50Hz supply. Find phase voltage, phase cuurent, line current, power consumed.

MCQ Question

(Total number of Question=Marks*3=16*3=48)

Note: Correct answer is marked with **bold.**

1. Form factor for a sine wave is _____
   a) 1.414
   c) 1.11
   b) 0.707
   d) 0.637
2. In an A.C. circuit power is dissipated in _____
   a) Resistance only
   c) Capacitance only
   b) Inductance only
   d) None of the above
3. The period of a wave is _____
   a) the same as the frequency
   c) expressed in amperes
   b) the time required to complete one cycle
   d) none of the above
4. The product of apparent power and cosine of the phase angle between circuitvoltage and current is _____
   a) True power
   c) Volt-amperes
   b) Reactive power
   d) Instantaneous power
5. 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
6. Active power and apparent power are respectively represented by?
   a) kW and kVAR
   c) kVA and kVAR
   b) kVAR and kVA
   d) kW and kVA
7. The frequency of an alternating current is _____
   a) The speed with which the alternator runs
   b) The number of cycles generated in one minute
   c) The number of waves passing through a point in one second
   d) The number of electrons passing through a point in one second
8. Series RC circuit has inpedance relaion as _____
   a) XL = Xc
   c) XL < Xc
   b) XL > Xc
   d) None of above
9. Identify this image:



a) Series RL circuit
b) Series RLC circuit
c) Series RC circuit
d) Parallel RLC Circuit

10. Series RC circuit has inpedance relaion as _____
a) XL = Xc
b) XL > Xc
c) XL < Xc
d) None of above

11. Instantaneous voltage is the product of resistance and _____ current in a resistive circuit.
a) Instantaneous
b) Average
c) RMS
d) Peak

12. Find the value of the instantaneous voltage if the resistance is 2 ohm and the instantaneous current in the circuit is 5A.
a) 5V
b) 2V
c) 10V
d) 2.5V

13. Find the value of the instantaneous voltage if the resistance is 2 ohm and the instantaneous current in the circuit is 5A.
a) 5V
b) 2V
c) 10V
d) 2.5V

14. The power for a purely resistive circuit is zero when?
a) Current is zero
b) Voltage is zero
c) Both current and voltage are zero
d) **Either current or voltage is zero**

15. The correct expression for the instantaneous current if instantaneous voltage is Vm(sint) in a resistive circuit is?
a) 1A
b) 2A
c) 3A
d) 4A

16. Calculate the resistance in the circuit if the rms voltage is 20V and the rms current is 2A.
a) 2 ohm
b) 5 ohm
c) 10 ohm
d) 20 ohm

17. The correct expression for the instantaneous current in a resistive circuit is?
a) i=Vm(sin t)/R
b) i=Vm(cos t)/R
c) i=V(sin t)/R
d) i=V(cos t)/R

18. The correct expression for the instantaneous current if instantaneous voltage is Vm(sint) in an inductive circuit is?

a) $i = Vm(sint)/X_L$
c) $i = -Vm(sint)/X_L$
b) $i = Vm(cost)/X_L$
d) $i = -Vm(cost)/X_L$

19. Inductor does not allow sudden changes in?

a) Voltage
c) Resistance
b) Current
d) Inductance

20. Inductance is _____ to number of turns in the coil.

a) directly proportional
c) equal
b) inversely proportional
d) not related

21. Choke involve use of _____

a) Resistor
c) Inductor
b) Capacitor
d) Transistor

22. What is the value of current in an inductive circuit when there is no applied voltage?

a) Minimum
c) Zero
b) Maximum
d) Cannot be determined

23. What is the current in an inductive circuit when the applied voltage is maximum?

a) Infinity
c) Zero
b) Maximum
d) Cannot be determined

24. In an inductive circuit, the voltage_____ the current?

a) Leads
c) Is greater than
b) Lags
d) Is less than

25. In an inductive circuit, the current_____ the voltage?

a) Leads
c) Is greater than
b) **Lags**
d) Is less than

26. In which device inductor cannot be used?

a) filter circuit
c) choke
b) Transformer
d) dielectric

27. A resistance of 7 ohm is connected in series with an inductance of 31.8mH. The circuit is connected to a 100V 50Hz sinusoidal supply. Calculate the current in the circuit.

a) 2.2A
c) 6.2A
b) 4.2A
d) 8.2A

28. A resistance of 7 ohm is connected in series with an inductance of 31.8mH. The circuit is connected to a x V 50Hz sinusoidal supply. The current in the circuit is 8.2A. Calculate the value of x.

a) 10V
b) 50V

c) **100V** **d)** 120

29. Which, among the following, is the correct expression for φ.
a) $\varphi=\tan^{-1}(XL/R)$ c) $\varphi=\tan^{-1}(XL*R)$
b) $\varphi=\tan^{-1}(R/XL)$ **d)** $\varphi=\cos^{-1}(XL/R)$

30. For an RL circuit, the phase angle is always _____
a) Positive c) 0
b) **Negative** d) 90

31. What is sinϕ from impedance triangle?
a) X_L/R c) R/Z
b) $\mathbf{X_L/Z}$ d) Z/R

32. What is the resonance frequency of ac circuit?
a) $\mathbf{1/\sqrt{LC}}$ c) $\sqrt{LC}$
b) $\sqrt{(L/C)}$ **d)** LC

33. What is impedance at resonance?
a) Maximum c) Zero
b) **Minimum** d) cannot be determined

34. What is the value of impedance at resonance?
a) X_L c) **R**
b) X_C d) 0

35. What is the resonance condition?
a) When $X_L>X_C$
b) When $X_L<X_C$
c) **When $\mathbf{X_L=X_C}$**
d) When X_C=infinity

3. Transformers & Single Phase Induction Motors

Position in Question Paper **Total Marks-16**

Q.1. f) 2-Marks.

Q.1. e) 2-Marks.

Q.2. a) 4-Marks.

Q.3. c) 4-Marks.

Q.4. d) 4-Marks.

Q.5. e) 6-Marks.

Descriptive Question

1. State types of transformer based on their construction
2. Define transformation ratio and write equation for it
3. Explain construction and principle of operation of single phase transformer
4. State any two application & start and run motor
5. Explain working of shaded pole induction motor
6. Explain working of universal motor with help of diagram.
7. Compare two winding transformer and autotransformer.
8. Explain autotransformer with neat diagram.
9. Derive emf equation of a transformer.
10. Why transformer rating is in kva.
11. Compare shell type and core type transformer.
12. Explain the principle of single phase capacitor start and run motor.
13. Explain split phase induction motor.
14. Describe working of AC servomotor with sketch

MCQ Question

(Total number of Question=Marks*3=16*3=48)

Note: Correct answer is marked with **bold.**

1. Out of the following which does not change in an ordinary transformer_____
   - **a) Frequency**
   - c) Current
   - b) Voltage
   - d) Any of the above
2. The transformer ratings are usually expressed in _____
   - a) Volts
   - c) KW
   - b) Amperes
   - **d) KVA**
3. Breather is provided in a transformer to _____
   - **a) Absorb moisture of air during breathing**
   - b) provide cold air in the transformer
   - c) The filter of transformer oil
   - d) None of above
4. Out of the following which losses varies with the load in the transformer?
   - a) Heat loss
   - c) Insertion loss
   - **b) Copper loss**
   - d) None of the above
5. A transformer transforms _____.
   - a) Frequency
   - c) Current
   - **b) Voltage**
   - d) Power
6. If the capacitor of a single-phase motor is short-circuited then _____
   - a) The motor will not start
   - c) The motor will burn
   - **b) The motor will run & stop mode**
   - d) None of the above
7. A centrifugal switch is used to disconnect 'starting winding when motor has_____
   - a) At start only
   - c) At full speed
   - b) Picked up 20% speed
   - **d) Picked up 50 – 70% speed**
8. Out of the following which is the most economical method of starting a single phase motor?
   - a) Resistance start method
   - **c) Capacitance start method**
   - b) Inductance start method
   - d) Split-phase method.
9. Property of coil to oppose any change in current flowing through it is called _____
   - a) Flux
   - c) Right hand rule
   - **b) Self-Inductance**
   - d) MMF

10. Which of the following component is usually fabricated out of silicon steel?
a) Bearings
c) Stator core
b) Shaft
d) None of the above

11. The frame of an induction motor is usually made of
a) silicon steel
c) aluminum
b) cast iron
d) bronze

12. The shaft of an induction motor is made of
a) stiff
c) hollow
b) flexible
d) any of the above

13. The shaft of an induction motor is made of
a) high speed steel
c) carbon steel
b) stainless steel
d) cast iron

14. In an induction motor, no-load the slip is generally
a) less than 1%
c) 2%
b) 1.5%
d) 4

15. In medium sized induction motors, the slip is generally around
a) 0.04%
c) 4%
b) 0.4%
d) 14

16. In squirrel cage induction motors, the rotor slots are usually given slight skew in order to
a) reduce windage losses
b) reduce eddy currents
c) reduce accumulation of dirt and dust
d) reduce magnetic hum

17. In case the air gap in an induction motor is increased
a) the magnetising current of the rotor will decrease
b) the power factor will decrease
c) speed of motor will increase
d) the windage losses will increase

18. Slip rings are usually made of
a) copper
c) phosphor bronze
b) carbon
d) aluminum

19. A 3-phase 440V,50 Hz induction motor has 4% slip.The frequency of rotor emf will be
a) 200 Hz
c) 2 Hz
b) 50 Hz
d) 0.2 Hz

20. In Ns is the synchronous speed and s the slip, then actual running speed of an induction motor will be

a) Ns
c) (l-s)Ns
b) s.N,
d) (Ns-l)s

21. The efficiency of an induction motor can be expected to be nearly

a) 60 to 90%
c) 95 to 98%
b) 80 to 90%
d) 99%

22. The number of slip rings on a squirrel cage induction motor is usually

a) two
c) four
b) three
d) none

23. The starting torque of a squirrel-cage induction motor is

a) low
b) negligible
c) same as full-load torque
d) slightly more than full-load torque

24. A double squirrel-cage induction motor has _____.

a) two rotors moving in opposite direction
b) two parallel windings in stator
c) two parallel windings in rotor
d) two series windings in stator

25. Star-delta starting of motors is not possible in case of

a) single phase motors
c) low horse power motors
b) variable speed motors
d) high speed motors

26. The term 'cogging' is associated with

a) three phase transformers
c) D.C. series motors
b) compound generators
d) induction motors

27. In case of the induction motors the torque is

a) inversely proportional to (Vslip)
c) inversely proportional to slip
b) directly proportional to (slip)2
d) directly proportional to slip

28. An induction motor with 1000 r.p.m. speed will have

a) 8 poles
c) 4 poles
b) 6 poles
d) 2 poles

29. The good power factor of an induction motor can be achieved if the average flux density in the air gap is

a) absent
c) large
b) small
d) infinite

30. An induction motor is identical to

a) D.C. compound motor
b) D.C. series motor
c) synchronous motor
d) asynchronous motor

31. The injected e.m.f. in the rotor of induction motor must have
a) zero frequency
b) the same frequency as the slip frequency
c) the same phase as the rotor e.m.f.
d) high value for the satisfactory speed control

32. Which of the following methods is easily applicable to control the speed of the squirrel-cage induction motor ?
a) By changing the number of stator poles
b) Rotor rheostat control
c) By operating two motors in cascade
d) By injecting e.m.f. in the rotor circuit

33. The crawling in the induction motor is caused by
a) low voltage supply
b) high loads
c) harmonics develped in the motor
d) improper design of the machine

34. The auto-starters (using three auto transformers) can be used to start cage induction motor of the following type
a) star connected only
b) delta connected only
c) none of the above
d) both a and (b)

35. The torque developed in the cage induction motor with autostarter is
a) k/torque with direct switching
b) (6) K x torque with direct switching
c) K2 x torque with direct switching
d) (d) k2/torque with direct switching

36. When the equivalent circuit diagram of double squirrel-cage induction motor is constructed the two cages can be considered
a) in series
b) in parallel
c) in series-parallel
d) in parallel with stator

37. It is advisable to avoid line-starting of induction motor and use starter because
a) Motor takes five to seven times its full load current
b) It will pick-up very high speed and may go out of step
c) It will run in reverse direction

d) Starting torque is very high

38. Steeples speed control of induction motor is possible by which of the following methods?

a) e.m.f. injection in rotor eueuit
c) Cascade operation
b) Changing the number of poles
d) None of the above

39. Rotor rheostat control method of speed control is used for

a) squirrel-cage induction motors only
b) slip ring induction motors only
c) both (a) and (b)
d) none of the above

40 . In the circle diagram for induction motor, the diameter of the circle represents

a) slip
c) running torque
b) rotor current
d) line voltage

41. For which motor the speed can be controlled from rotor side ?

a) Squirrel-cage induction motor
c) Both (a) and (b)
b) Slip-ring induction motor
d) None of the above

42. If any two phases for an induction motor are interchanged

a) the motor will run in reverse direction
b) the motor will run at reduced speed
c) the motor will not run
d) the motor will burn

43. An induction motor is

a) self-starting with zero torque
c) self-starting with low torque
b) self-starting with high torque
d) non-self starting

44. The maximum torque in an induction motor depends on

a) frequency
c) square of supply voltage
b) rotor inductive reactance
d) all of the above

45. In three-phase squirrel-cage induction motors

a) rotor conductor ends are short-circuited through slip rings
b) rotor conductors are short-circuited through end rings
c) rotor conductors are kept open
d) rotor conductors are connected to insulation

46. In a three-phase induction motor, the number of poles in the rotor winding is always

a) zero
b) more than the number of poles in stator
c) less than number of poles in stator
d) equal to number of poles in stator

47. DOL starting of induction motors is usually restricted to

a) low horsepower motors
c) high horsepower motors
b) variable speed motors
d) high speed motors

48. The speed of a squirrel-cage induction motor can be controlled by all of the following except

a) changing supply frequency
c) changing winding resistance
b) changing number of poles
d) reducing supply voltage

49. The 'crawling" in an induction motor is caused by

a) high loads
b) low voltage supply
c) improper design of machine
d) harmonics developed in the motor

50. The power factor of an induction motor under no-load conditions will be closer to

a) **0.2 lagging**
c) 0.5 leading
b) 0.2 leading
d) unity

51. The 'cogging' of an induction motor can be avoided by

a) using DOL starter
b) auto-transformer starter
c) having number of rotor slots more or less than the number of stator slots (not equal)
d) None

52. If an induction motor with certain ratio of rotor to stator slots, runs at 1/7 of the normal speed, the phenomenon will be termed as

a) humming
c) crawling
b) hunting
d) cogging

53. Size of a high speed motor as compared to low speed motorfor the same H.P. will be

a) bigger
c) same
b) smaller
d) any of the above

54. A 3-phase induction motor stator delta connected, is carrying full load and one of its fuses blows out. Then the motor

a) will continue running burning its one phase
b) will continue running burning its two phases
c) will stop and carry heavy current causing permanent damage to its winding
d) will continue running without any harm to the winding

55. A 3-phase induction motor delta connected is carrying too heavy load and one of its fuses blows out. Then the motor

a) will continue running burning its one phase

b) will continue running burning its two phase
c) will stop and carry heavy current causing permanent damage to its winding
d) will continue running without any harm to the winding

56. Low voltage at motor terminals is due to
a) inadequate motor wiring
b) poorely regulated power supply
c) any one of the above
d) none of the above

57. In an induction motor the relationship between stator slots and rotor slots is that
a) stator slots are equal to rotor slots
b) stator slots are exact multiple of rotor slots
c) stator slots are not exact multiple of rotor slots
d) none of the above

58. Slip ring motor is recommended where
a) speed control is required
b) frequent starting, stopping and reversing is required
c) high starting torque is needed
d) all above features are require

59. As load on an induction motor goes on increasing
a) its power factor goes on decreasing
b) its power factor remains constant
c) its power factor goes on increasing even after full load
d) its power factor goes on increasing upto full load and then it falls again

60. If a 3-phase supply is given to the stator and rotor is short circuited rotor will move
a) in the opposite direction as the direction of the rotating field
b) in the same direction as the direction of the field
c) in any direction depending upon phase squence of supply
d) None

61. It is advisable to avoid line starting of induction motor and use starter because
a) it will run in reverse direction
b) it will pick up very high speed and may go out of step
c) motor takes five to seven times its full load current
d) Starting torque is very high

62. The speed characteristics of an induction motor closely resemble the speed load characteristics of which of the following machines
a) D.C. series motor
b) D.C. shunt motor
c) universal motor
d) none of the above

4. Electronic Components and Signals

Position in Question Paper **Total Marks-12**

Q.1. a) 2-Marks.
Q.1. d) 2-Marks.
Q.2. b) 4-Marks.
Q.4. c) 4-Marks.
Q.5. a) 6-Marks.

Descriptive Question

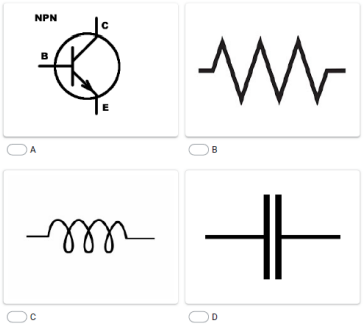
1. State the active component.
2. Define A.C &D.C .
3. State the passive component.
4. Define resistor draw symbol and write the formula.
5. What is carbon composition resistor and draw neat diagram?
6. Write short note on wire wound resistor.
7. Give the classification of capacitor.
8. Write short note on electrolytic capacitor and mica capacitor.
9. Define inductor and give the classification on it.
10. Write short note on ferrite core inductor.
11. Derive the value of resistor for following Color codes.
12. What is ideal voltage source and ideal current sources?
13. What is integrated circuit and give the classification of it.
14. Differentiate between analog and digital ICs.

MCQ Question

(Total number of Question=Marks*3=16*3=48)

Note: Correct answer is marked with **bold.**

1. Out of following which is not a type of passive component:
   a) Resistor
   b) Capacitor
   c) FET
   d) Inductor
2. The property of opposition to change in flow of current is known as _____
   a) Capacitance
   b) Resistance
   c) Conductance
   d) Inductance
3. Calculate the value of resistance of following color code resistance: RED REDORANGE GOLD
   a) 1.2 K Ohm
   b) 470 Ohm
   c) 97 K Ohm
   d) 22 K Ohm
4. Out of following is not a type of capacitor:
   a) Ceramic Capacitor
   b) Mica Capacitor
   c) Wire wound
   d) Electrolytic Capacitor
5. Out of following which is not a advantage of Integrated circuit:
   a) Small size and weight
   b) High reliability
   c) High speed
   d) High initial cost
6. Identify the symbol of Inductor:



7. The number of cycle of waveform per second is defined as _____ .
   a) Frequency
   b) Time period
   c) Amplitude
   d) Wavelength
8. An active device is one which _____
   a) Mechanically controls electron flow
   b) Electrically controls electron flow

c) Pneumatically controls electron flow
d) Automatically controls electron flow

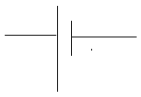
9. Which of the following elements comprise of the passive devices?
a) Resistors, Capacitors and SCRs
b) Vacuum Tubes, SCRs and Diodes
c) Transformers, Inductors and Diodes
d) Transformers, TRIACs and DIACs

10. A transistor is a current controlled device because_____
a) In the base region movement of charge carrier is because of the electrons which are minority charge carrier in the base region
b) In the collector region movement of charge carrier is because of the electrons which are minority charge carrier in the collector region
c) In the base region movement of charge carrier is because of the holes which are majority charge carrier in the base region
d) In the collector region movement of charge carrier is because of the holes which are majority charge carrier in the base region

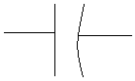
11. Active devices can also be used as_____
a) Amplifiers
b) Choppers
c) Converters
d) Inverters

12. How do amplifiers work without violating Law of Conservation of Energy?
a) They amplify one factor of the input and reduce others
b) They work on the law of conservation of mass
c) They violate the Law of Conservation of Energy
d) They amplify the signal by taking an input from an external source

13. The symbol used for capacitance is _____

a) 

c) 

b) 

d) 

14. The formula used to find the capacitance C is _____
a) Q/v
b) Qv
c) Q-v
d) Q + v

15. he capacitor doesn’t allow sudden changes in _____

a) Voltage c) Resistance
b) Current d) Capacitance

16. The Inductor doesn't allow sudden changes in _____
a) Voltage c) Resistance
b) Current d) Inductance

17. The expression for energy of an inductor _____
a) ½ LI c) ½ L^2I
b) L/2I **d) ½ LI**

18. The units for inductance is _____ and capacitance is _____
a) Faraday, Henry **c) Henry, Faraday**
b) Coulomb, Faraday d) Henry, Coulomb

19. If a capacitor of capacitance 9.2F has a voltage of 22.5V across it. Calculate the energy of the capacitor.
a) 5062.5W c) 50.625W
b) 506.25W d) 50625W

20. If the voltage across a capacitor is constant, then current passing through it is _____
a) 1 c) -1
b) 0 d) Infinity

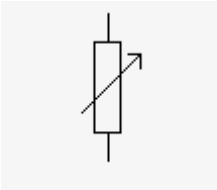
21. n Inductor works as a _____ circuit for DC supply.
a) Open c) Polar
b) Short d) Non-polar

22. The insulating medium between the two plates of capacitor is known as _____
a) Electrode c) Conducting medium
b) Capacitive medium **d) Dielectric**

23. Two capacitors, each of 220 µF, are connected in parallel. The capacitance of the combination will be:
a) 110µF **c) 440µF**
b) 220µF d) 420mf

24. If the resistance of a material falls with increasing temperature it is said to have:
a) negative temperature coefficient
b) positive temperature coefficient
c) zero temperature coefficient
d) variable temperature coefficeint

25. The circuit symbol shown is a:



a) fixed resistor
b) preset resistor
c) variable resistor
d) temperature resistor

26. Two capacitors, each of 15 µF, are connected in series. The capacitance of the combination will be:

a) **7.5µF**
b) 15µF
c) 30µF
d) 4.5mF

27. The fourth band of a four band resistor is marked in silver. This indicates a tolerance of:

a) 5%
b) 10%
c) 20%
d) 40%

28. The primary and secondary voltages present in a loss-free transformer are 240 V and 12 V respectively. If the secondary is connected to a 6 Ω resistor, which one of the following gives the primary current?

a) 100 mA
b) 20 A
c) 2 A
d) 5mA

29. The third band of a four band resistor is marked in black. This indicates a multiplier of:

a) 1
b) 10
c) 100
d) 1000

30. Two inductors, each of 6.8 mH, are connected in parallel. The inductance of the combination will be:

a) **3.4 mH**
b) 6.8 mH
c) mH
d) 34mH

31. A loss-free transformer has 1200 primary turns and 300 secondary turns. If the primary winding is connected to a 200 V AC supply which one of the following gives the secondary voltage:

a) **50 V**
b) 900 V
c) 800 V
d) 15 V

32. A 100 nF capacitor has a tolerance of ±5%. The maximum possible value for this component will be:

a) 95 nF
b) 105 nF
c) **1**10 nF
d) 58nF

33. he resistance of a light dependent resistor:

a) f**alls with increasing light level**
b) increases with increasing light level
c) remains constant irrespective of light level
d) increases with decreasing light level

34. Two resistors, each of 15 Ω, are connected in series. The resistance of the combination will be:

a) 7.5Ω
c) 30Ω
b) 5Ω
d) 8Ω

35. A graph of charge, Q, plotted against voltage, V, for a capacitor will take the form of:

a) a curve that rises rapidly
c) **a straight line.**
b) a curve that falls rapidly
d) a exponential line

36. The third band of a four band resistor is marked in orange. This indicates a multiplier of:

a) 1,000
c) 100,000
b) 10,000
d) 150,000

5. Diodes and applications

Position in Question Paper **Total Marks-12**

Q.1. a) 2-Marks.
Q.1. d) 2-Marks.
Q.2. b) 4-Marks.
Q.4. c) 4-Marks.
Q.5. a) 6-Marks.

Descriptive Question

1. Write a short note on intrinsic and extrinsic semiconductor device
2. Define doping and state the types of doping
3. Explain how depletion region is form in P-N junction diode
4. Explain the formation of P-N junction diode
5. With circuit diagram explain the operation of forward bios of diode
6. Define cut of voltage &breakdown voltage
7. Explain the working of diode in reverse bios condition
8. What is mean by breakdown and explain any (zener)or (avalanche)
9. What is Zener diode &explain its operation in forward and reverse
10. Compare P-N junction diodes & Zener diode (ANY FOUR POINTS)
11. Explain the working principle of LED
12. With neat diagram explain how LED emits light
13. Write the materials used for manufacturing different types of LED
14. Write down the working of full wave bridge rectifier with its circuit diagram
15. What is filter and state its types
16. Draw and explain circuit of half wave rectifier with shunt capacitor filter

MCQ Question

(Total number of Question=Marks*3=16*3=48)

Note: Correct answer is marked with **bold.**

1. The forward voltage drop across a silicon diode is about _____ .
   a) 2.5 V
   b) 3 V
   c) 10 V
   d) 0.7 V
2. A transistor has _____ PN junctions.
   a) One
   b) Two
   c) Three
   d) Four
3. Main use of Zener diode is in which biasing mode?
   a) Forward Biasing
   b) Reverse Biasing
   c) Both
   d) None of the above
4. Total number of diodes used in Bridge full wave rectifier is _____.
   a) 1
   b) 2
   c) 3
   d) 4
5. Out of following which material is not used in combination of manufacturingLEDs.
   a) Gallium
   b) Arsenide
   c) Phosphate
   d) Germanium
6. Out of following, Which one isn't a type of rectifier?
   a) Precision Half-wave Rectifier
   b) Bridge Rectifier
   c) Peak Rectifier
   d) Centre tapped Rectifier
7. In a full wave rectifier, if the input frequency is 50 Hz, then output frequencywill be _____ .
   a) 50 Hz
   b) 75 Hz
   c) 100 Hz
   d) 200 Hz
8. _____ is not a type of filter component in regulated power supply circuit.
   a) Shunt C Filter
   b) Series L Filter
   c) LC Filter
   d) Transistor
9. Except transformer, the main parts of regulated power supply are _____
   a) Filter and Regulator
   b) Filter and transistor
   c) Transistor and Regulator
   d) Rectifier, Filter and Transistor
10. The AC components are filtered most to produce pure DC by which of thefollowing filter?
   a) C-L-C Filter
   b) Shunt Capacitor

c) Series Inductor
d) L-C Filter

11. In P-N-P transistor, base will be of _____ material.
a) P material
b) N material
c) Either of the above
d) None of the above

12. The base current amplification factor β is given by_____ .
a) IB/IC
b) IE/IB
c) IB/IE
d) IC/IB

13. The relation between α and β is_____ .
a) $\beta = \alpha/(1-\alpha)$
b) $\alpha = \beta/(1+\beta)$
c) $\beta = \alpha/(1+\alpha)$
d) $\alpha = \beta/(1-\beta)$

15.Consider a peak rectifier fed by a 60-Hz sinusoid having a peak value Vp = 100 V. Let the load resistance R = 10 kΩ. Calculate the fraction of the cycle during which the diode is conducting
a) 1.06 %
b) 2.12 %
c) 3.18%
d) 4.24%

15. Ageing of a selenium rectifier may change the output voltage by
a) 5 to 10%
b) 15 to 20%
c) 25 to 30%
d) None of the above

16. Which off the following rectifiers are primarily used for charging of low-voltage batteries from AC supply ?
a) Mechanical rectifiers
b) Copper oxide rectifiers
c) Selenium rectifiers
d) Electrolytic rectifiers

17. he diode in a half wave rectifier has a forward resistance RF. The voltage is $V_m \sin\omega t$ and the load resistance is RL. The DC current is given by _____
a) $V_m/\sqrt{2}R_L$
b) $V_m/(R_F+R_L)\pi$
c) $2V_m/\sqrt{\pi}$
d) V_m/R_L

18. In a half wave rectifier, the sine wave input is 50sin50t. If the load resistance is of 1K, then average DC power output will be?
a) 3.99V
b) 2.5V
c) 5.97V
d) 6.77V

19. In a half wave rectifier, the sine wave input is 200sin300t. The average value of output voltage is?
a) 57.876V
b) 67.453V
c) 63.694V
d) 76.987V

20. Efficiency of a half wave rectifier is

a) 50%
c) 40.6%
b) 60%
d) 46%

21. If peak voltage for a half wave rectifier circuit is 5V and diode cut in voltage is 0.7, then peak inverse voltage on diode will be?
a) 5V
c) 4.3V
b) 4.9V
d) 6.7V

22. Transformer utilisation factor of a half wave rectifier is _____
a) 0.234
c) 0.287
b) 0.279
d) 0.453

23. If the input frequency of a half wave rectifier is 100Hz, then the ripple frequency will be_____
a) 150Hz
c) 100Hz
b) 200Hz
d) 300Hz

24. Ripple factor of a half wave rectifier is_____(I_m is the peak current and RL is load resistance
a) 1.414
c) 1.4
b) 1.21
d) 0.48

25. Efficiency of a centre tapped full wave rectifier is _____
a) 50%
c) 70%
b) 46%
d) 81.2%

26. A full wave rectifier supplies a load of 1KΩ. The AC voltage applied to diodes is 220V (rms). If diode resistance is neglected, what is the ripple voltage?
a) 0.562V
c) 0.954V
b) 0.785V
d) 0.344V

27. A full wave rectifier delivers 50W to a load of 200Ω. If the ripple factor is 2%, calculate the AC ripple across the load.
a) 2V
c) 4V
b) 5V
d) 1V

28. A full wave rectifier uses load resistor of 1500Ω. Assume the diodes have R_f=10Ω, R_r=∞. The voltage applied to diode is 30V with a frequency of 50Hz. Calculate the AC power input.
a) 368.98mW
c) 145.76mW
b) 275.2mW
d) 456.78mW

29. If input frequency is 50Hz for a full wave rectifier, the ripple frequency of it would be _____

a) 100Hz
c) 25Hz
b) 50Hz
d) 500Hz

30. Transformer utilization factor of a centre tapped full wave rectifier is_____
a) 0.623
c) 0.693
b) 0.678
d) 0.625

31. If the peak voltage on a centre tapped full wave rectifier circuit is 5V and diode cut in voltage is 0.7. The peak inverse voltage on diode is_____
a) 4.3V
c) 5.7V
b) 9.3V
d) 10.7V

32. In a centre tapped full wave rectifier, the input sine wave is 250sin100t. The output ripple frequency will be _____
a) 50Hz
c) 25Hz
b) 100Hz
d) 200Hz

33. DC average current of a bridge full wave rectifier (where I_m is the maximum peak current of input).
a) $2I_m$
c) $I_m/2$
b) I_m
d) $1.414I_m$

34. Ripple factor of bridge full wave rectifier is?
a) 1.414
c) 0.482
b) 1.212
d) 1.321

35. If input frequency is 50Hz then ripple frequency of bridge full wave rectifier will be equal to_____
a) 200Hz
c) 45Hz
b) 50Hz
d) 100Hz

36. Transformer utilization factor of bridge full wave rectifier _____
a) 0.623
c) 0.693
b) 0.812
d) 0.825

6. Bipolar junction transistor

Position in Question Paper **Total Marks-10**

Q.1. a) 2-Marks.

Q.1. d) 2-Marks.

Q.2. b) 4-Marks.

Q.4. c) 4-Marks.

Q.5. a) 6-Marks.

Descriptive Question

1. Explain the working of NPN transistor.
2. Draw common base configuration and draw input and output waveforms.
3. Derive relation between α and β.
4. Draw and explain single stage CE amplifier.
5. Explain the working of CE amplifier and draw its frequency response.
6. Draw common emitter configuration and draw input and output waveforms.
7. Draw common collector configuration and draw input and output waveforms.
8. Give the types of biasing of transistor.
9. Draw transistor as a switch and explain.
10. Compare CE, CB, and CC configuration.
11. Draw i/p and o/p characteristics of CE configurations.

MCQ Question

(Total number of Question=Marks*3=10*3=30)

Note: Correct answer is marked with **bold.**

1. In transformer coupled amplifier, coupling takes place using _____.
   a) Capacitor
   c) Transformer
   b) Single Wire
   d) RC Network
2. The colour code for 680 uH inductor with +- 5% tolerance is:
   a) Blue Grey Brown Gold
   c) Orange Grey Brown Gold
   b) Black Grey Brown Gold
   d) Red Grey Brown Gold
3. The typical value of the current gain of a common-base configuration is_____ .
   a) Less than 1
   c) Between 100 and 200
   b) Between 1 and 50
   d) Undefined
4. The doping concentration of which terminal of BJT transistor is highest?
   a) Base
   c) Collector
   b) Emitter
   d) Same for all terminals
5. The current gain of common base configuration is denoted by _____.
   a) Beta
   c) Alpha
   b) Gama
   d) Zeta
6. Which of the following is not a part of a BJT?
   a) Base
   c) Emitter
   b) Collector
   d) None of the mentioned
7. The number of pn junctions in a BJT is/are
   a) 1
   c) 3
   b) 2
   d) 4
8. In which of the following modes can a BJT be used?
   a) Cut-off mode
   c) Saturation mode
   b) Active mode
   d) All of the mentioned
9. If a BJT is to be used as an amplifier, then it must operate in_____
   a) Cut-off mode
   c) Saturation mode
   b) Active mode
   d) All of the mentioned
10. f a BJT is to be used as a switch, it must operate in_____
    a) Cut-off mode or active mode
    b) Active Mode or saturation mode

c) Cut-off mode or saturation mode

d) Cut-off mode or saturation mode or active mode

11. On which of the following does the scale current not depends upon?

a) Effective width of the base

b) Charge of an electron

c) Electron diffusivity

d) Volume of the base-emitter junction

12. On which of the following does the collector current not depends upon?

a) Saturation current

b) Thermal voltage

c) Voltage difference between the base and emitter

d) None of the mentioned

13. The range for the transistor parameter also referred as common-emitter current gain has a value of_____ for common devices.

a) 50-200

c) 750-1000

b) 400-600

d) > 1000

14. The curve between the collector current versus the potential difference between the base and emitter is

a) A straight line inclined to the axes

c) An exponentially varying curve

b) A straight line parallel to the x-axis

d) A parabolic curve

15. The curve between the collector current and the saturation is

a) A straight line inclined to the axes

b) A straight line parallel to the x-axis

c) A straight line parallel to the y-axis

d) An exponential curve

16. The correct relation between the transistor parameters α and ß are related by

a) ß = 1 – α/α

c) α = ß + 1/ß

b) ß = 1 + α/α

d) α = ß/ß + 1

17. The correct expression relating the emitter current Ie to the collector current Ic is

a) Ie = α Ic

c) Ie = ß Ic

b) Ic = α Ic

d) Ic = ß Ic

18. The value of the thermal voltage at room temperature can be approximated as

a) 25 mV

c) 35 mV

b) 30 mV

d) 40 mV

19. The correct relation between the emitter current Ie and the base current Ib is given by

a) Ib = (1 + α) Ie
c) Ie = (1 – ß) Ib
b) Ib = (α – 1) Ie
d) Ie = (1 + ß) Ib

20. The Early Effect is also called as

a) Base-width modulation effect
c) Both of the mentioned
b) Base-width amplification effect
d) None of the mentioned

21. For the BJT to operate in active mode Collector-Base junction must be

a) Heavily doped
c) Must be forward bias
b) Must reversed bias
d) Lightly doped

22. Which of the following condition is true for cut-off mode?

a) The collector current Is zero
b) The collector current is proportional to the base current
c) The base current is non zero
d) All of the mentioned

23. Which of the following is true for the cut-off region in an npn transistor?

a) Potential difference between the emitter and the base is smaller than 0.5V
b) Potential difference between the emitter and the base is smaller than 0.4V
c) The collector current increases with the increase in the base current
d) The collector current is always zero and the base current is always non zero

24. Which of the following is true for a typical active region of an npn transistor?

a) The potential difference between the emitter and the collector is less than 0.5 V
b) The potential difference between the emitter and the collector is less than 0.4 V
c) The potential difference between the emitter and the collector is less than 0.3 V
d) The potential difference between the emitter and the collector is less than 0.2 V

25. Which of the following is true for the active region of an npn transistor?

a) The collector current is directly proportional to the base current
b) The potential difference between the emitter and the collector is less than 0.4 V
c) All of the mentioned
d) None of the mentioned

26. Which of the following is true for the saturation region of BJT transistor?

a) The collector current is inversely proportional to the base current
b) The collector current is proportional to the square root of the collector current
c) The natural logarithm of the collector current is directly proportional to the base

current

d) None of the mentioned

27. Which of the following is true for a npn transistor in the saturation region?\

a) The potential difference between the collector and the base is approximately 0.2V

b) The potential difference between the collector and the base is approximately 0.3V

c) The potential difference between the collector and the base is approximately 0.4V

d) The potential difference between the collector and the base is approximately 0.5V

28. The potential difference between the base and the collector Vcb in a pnp transistor in saturation region is _____

a) -0.2 V

b) -0.5V

c) 0.2 V

d) 0.5 V

29. For a pnp transistor in the active region the value of Vce (potential difference between the collector and the base) is

a) Less than 0.3V

b) Less than 3V

c) Greater than 0.3V

d) Greater than 3V

30. Which of the following is true for a pnp transistor in active region?

a) CB junction is reversed bias and the EB junction is forward bias

b) CB junction is forward bias and the EB junction is forward bias

c) CB junction is forward bias and the EB junction is reverse bias

d) CB junction is reversed bias and the EB junction is reverse bias

31. Which of the following is true for a pnp transistor in saturation region?

a) CB junction is reversed bias and the EB junction is forward bias

b) CB junction is forward bias and the EB junction is forward bias

c) CB junction is forward bias and the EB junction is reverse bias

d) CB junction is reversed bias and the EB junction is reverse bias

32. Find the maximum allowed output negative swing without the transistor entering saturation, and

a) 1.27 mV

b) 1.47 mV

c) 1.67 mV

d) 1.87 mV

33. The corresponding maximum input signal permitted is

a) 1.64 mV

b) 1.74 mV

c) 1.84 mV

d) 1.94 mV