

-) Enhancement mode JFET d) has a p-type substrate
- viii) A dot near the transistor pin denotes
- a). emitter b). base
c). Collector d). None of the above
- ix) Transistor works as an open switch when emitter junction is.....biased and collector junction is.....biased
- a). Forward, reverse b). Reverse, reverse
c). Reverse, forward d). Forward, forward
- x) The majority carriers in case of NPN silicon transistor are
- a). Electrons b). Electron-hole pairs
c). Holes d). Impurity ions

1) Define

(5×2=10)

- a. Pinch off
b. Reverse saturation current
c. Surface inversion
d. Zener breakdown
e. MOS Capacitor

PART B

Answer any four Questions

(4×5=20)

- 1) Define the term Power Amplifier.
- 2) What do you mean by Ideal voltage amplifier?
- 3) Draw the Darlington pair circuit and explain.
- 4) What do you mean by the stability factor of a transistor circuit?
- 5) What is the Purpose of feedback in an electronic circuit?
- 6) Explain how oscillator generates an electronic signal?

PART C

Answer any Three Question

(3×10=30)

- 1) for a given transistor $\beta_{dc} = 0.98$, $I_E = 2mA$. calculate β_{dc} and I_B .
- 2) Define β_{dc} and β_{ac} also deduce the relation between β_{dc} and β_{ac} .
- 3) Transistor is connected in common emitter configuration as an amplifier. The parameters of the transistor specified are: $I_B = 25\mu A$, $I_{CBO} = 100nA$, $\beta = 100$, Find I_C , I_E , α .
- 4) Draw and explain the characteristics of JFET.
- 5) A JFET has drain current of 15 mA. If $I_{DSS} = 25mA$ and $V_P = 5V$, find V_{GS} .
- 6) Explain the working principle of WIEN Bridge oscillator.
- 7) Explain Barkhausen criteria and also discuss the essential elements of an oscillator.
- 8) Define h parameters for a BJT.
- 9) What do you mean by noise and noise figure? Explain Thermal noise, shot noise and flicker noise.



ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2019-20

Subject: Transformer & Generator
Branch – Electrical & Electronics Engg
Time :3 Hours

Course: B.Tech EEE
Full Marks :70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

Q1.) All questions are compulsory:-

A] Objective Answer Type

(10x1=10)

- i) The flux created by the current flowing through the primary winding induces emf in
- primary winding only
 - secondary winding only
 - transformer core only
 - both primary and secondary windings
- ii) In a transformer electrical power is transferred from primary to secondary
- Through air
 - By magnetic flux
 - Through insulation medium
 - None of these
- iii) The low voltage winding of a 400/230 V single phase 50 HZ transformer is to be connected to a 25 HZ supply. In order to keep the magnetization current at the same level in both the cases the voltage at 25 Hz should be
- | | |
|----------|----------|
| a) 230 V | c) 115 V |
| b) 460 V | d) 65 V |
- iv) On no-load phasor diagram of transformer, the core loss component of the current remains in phase with
- | | |
|--------------------|----------------------------|
| a) No-load current | b) primary supply voltage |
| c) core flux | d) primary induced voltage |
- v) The flux in transformer core
- | | |
|--|------------------------|
| a) Increases with load | b) decreases with load |
| c) remains constant irrespective of load | d) none of the above |

- vi) Name the various methods for determining the voltage regulation for 3 phase alternator and describe any one method.

PART C

Answer any Three:

(3x10=30)

- Q3.)**What is On load tap changing transformer, Explain with diagram.
- Q4.)**Write the choice between single unit three phase transformer & a bank of three single phase transformer.
- Q5.)**Discuss and draw equivalent circuit and phasor diagram of single phase transformer at no load and on load.
- Q6.)**Derive emf equation of alternator with winding factor, Describe each term.
- Q7.)**Explain armature reaction of alternator at various power factor and its effect.
- Q8.)**Explain open circuit test and short circuit test of transformer with circuit diagram.



Subject : Electrical Machines 1

Time : 3 Hours

Course: B.Tech EEE

Full Marks: 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.
- **Draw relevant figures/block diagrams/quote examples where ever necessary.**

PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions:

(10x1=10)

- What will happen if DC shunt motor is connected across AC supply?
 - Will run at normal speed
 - Will not run
 - Will Run at lower speed
 - Burn due to heat produced in the field winding
- What will happen if the back emf of a DC motor vanishes suddenly?
 - The motor will stop
 - The motor will continue to run
 - The armature may burn
 - The motor will run noisy
- What will happen, with the increase in speed of a DC motor?
 - Back emf increase but line current falls.
 - Back emf falls and line current increase.
 - Both back emf as well as line current increase.
 - Both back emf as well as line current fall.
- Which part will surely tell that given motor is DC motor and not an AC type?
 - Winding
 - Shaft
 - Commutator
 - Stator
- In DC motor, which of the following part can sustain the maximum temperature rise?
 - Field winding
 - Commutator
 - Slip rings
 - Armature winding
- Armature in a dc machine is made of laminated steel instead of wood because it has
 - Low permeability
 - High permeability
 - More mechanical strength
 - More mechanical strength and high permeability
- In dc machines, armature windings are placed on the rotor because of the necessity for
 - Electromechanical energy conversion
 - Generation of voltage
 - Commutation
 - Development of torque
- In a dc machine, the armature MMF is always directed along the

- a) Polar axis
 - b) Brush axis
 - c) Interpolar axis
 - d) none of these
- ix. In a dc generator, in armature conductor along MNA
- a) Maximum current is produced
 - b) Maximum emf is produced
 - c) Minimum emf is product
 - d) Minimum current is produced
- x. The insulating material used for the commutator segment is generally
- a. Graphite
 - b. Carbon
 - c. Mica
 - d. Insulating varnis

B] Very Short question

- a) Define coil pitch and coil span.
- b) Why is commutator employed in DC Machine?
- c) What are the benefits of short pitched coils?
- d) How does a DC motor differ from a DC generator in construction?
- e) What do you understand by speed regulation of DC motor?

(5x2=10)

PART B

Q2. Answer any four:

- a) Explain the operation of parallel operation of D.C shunt generators
- b) What are the different methods of improving commutation in a D.C machine? Explain any one.
- c) Describe with suitable diagram various types of DC machines.
- d) What are the uses and functions of interpoles/compoles?
- e) Write a short note on DC generator characteristics.
- f) Derive an equation for induced EMF in a generator.

(4x5=20)

PART C

Answer any three:

- Q.3) Explain in brief the action of commutation in a generator.
- Q.4) Explain the speed, torque and current characteristics of a DC shunt motor.
- Q.5) Explain in detail speed control by field control method of DC series motor.
- Q.6) Explain the process of armature reaction and bring about their important conclusions.
- Q.7) Why are starters necessary for DC machine? Explain three point starter.
- Q.8) What are the different methods of speed control of shunt motors? Explain any one method in brief.

(3x10=30)



ARKA JAIN University, Jharkhand
3rd Semester Final Examination – 2019-20

Subject: Electric Circuit Analysis

Time : 3 Hours

Course: B.TECH EEE

Full Marks: 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A & B** are compulsory.

PART A

Multiple Choice Questions

(10x1=10)

- i) The capacitor doesn't allow sudden changes in _____
a) Voltage
b) Current
c) Resistance
d) Capacitance
- ii) An Inductor works as a _____ circuit for DC supply
a) Open
b) Short
c) Polar
d) Non-polar
- iii) The other name for Gain is _____
a) Scaling factor
b) Output
c) Amplifying factor
d) Scaling level
- iv) The input applied to an Inverting amplifier is _____
a) Equal to output
b) Equal to Inverted output
c) Not equal to output
d) none
- v) Permeability is analogous to _____
a) Conductivity
b) Resistivity
c) Retentively
d) both a and b
- vi) In two-port networks the parameter h_{22} is called _____
a) Short circuit input impedance
b) Short circuit current gain
c) Open circuit reverse voltage
d) Open circuit output admittance
- vii) The energy required to charge a $10 \mu\text{F}$ capacitor to 100 V is _____
a) 0.01 J
b) 0.05 J
c) None
d) both a and b
- viii) The relation between α , β , γ is?
a) $\alpha = \gamma + j\beta$
b) $\gamma = \alpha + j\beta$
c) $\beta = \gamma + j\alpha$
d) $\alpha = \beta + j\gamma$
- ix) The value of α in the pass band of constant k-low pass filter is?
a) π
b) $\pi/4$
c) $\pi/2$
d) 0
- x) The formula used to find the capacitance C is _____
a) Q/v
b) Qv
c) $Q-v$
d) both a and b

Answer all:

(5x2=10)

1. What is mean by active elements?
2. What is ideal source?
3. Types of bridges?
4. Draw the diagram of series RLC circuit?
5. Difference between mesh and node analysis?

PART B

ANSWER ANY FOUR

(4x5=20)

- Q.2) Define and explain about Transient analysis of RL circuit?
- Q.3) Drive the Reciprocity theorem and one example?
- Q.4) Explain about the Important steps for testing?
- Q.5) Describe about star- delta transformation?
- Q.6) Explain about the initial value theorem?
- Q.7) Drive the Norton's theorem and one example?

PART C

ANSWER ANY THREE

- Q.8) Drive the Maximum power transfer theorem and one example? **(3x10=30)**
- Q.9) Explain about the Laplace transformation?
- Q.10) Explain about analysis of series RLC circuit?
- Q.11) Explain about the open circuit impedance?

ix) Electronic voltmeters are _____

a) Compact

c) Small

b) large

d) None

x) Clock pulses are controlled _____

a) Automatically

c) using valves

b) using microcontrollers

d) manual

Answer all:

(5x2=10)

1. What is mean by capacitance?
2. What is mean by error?
3. Types of bridges?
4. Draw the diagram LPF wattmeter?
5. What is mean by force factor?

PART B

(4x5=20)

ANSWER ANY FOUR

Q.2) Construction and operation of three phase dynameters?

Q.3) Drive the Kelvin's double bridge?

Q.4) Describe the features of ammeters and voltmeters?

Q.5) describe about errors and minimization of LPF & UPF wattmeter?

Q.6) Explain about DVM and applications?

Q.7) Explain about errors of CT & PT?

PART C

ANSWER ANY THREE

(3x10=30)

Q.8) Explain about Silsbee's method?

Q.9) Drive the hay's bridge and desauty bridge?

Q.10) Explain about LED and applications?

Q.11) Explain about visual displays and applications