



Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes

Branch: Electrical Engineering
Course Code: BT EE 301A
Course Title: Electrical Circuit Analysis

Max Time: 3 hours
Max Marks: 70

Instructions:

Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- (a) State duality and Dual Network.
- (b) State Transfer function.
- (c) What do you mean by Quality factor.
- (d) Find the Laplace transform of unit step function and impulse function
- (e) What do you mean by Convolution.
- (f) An inductance of 8.0 mH is in series with two inductances in parallel, one of 3.0 mH and the other 6.0 mH. Find L_{eq} .
- (g) Define Transconductance.

PART -II

Q. No.2

Obtain the Thévenin and Norton equivalents for the network shown in Fig.1

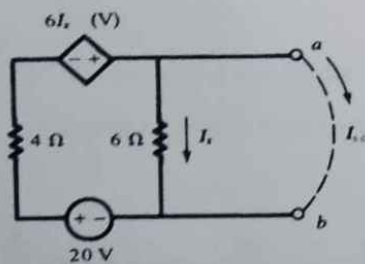


Fig. 1

OR



Q. No.2

Find the maximum power that the active network to the left of terminals ab can deliver to the adjustable resistor R in Fig. 2

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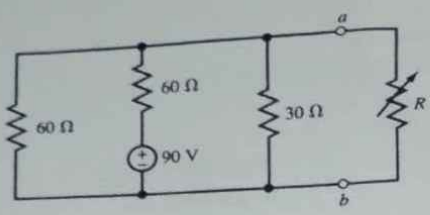


Fig. 2

Q. No.3 A 400 V, balanced three-phase supply is connected to a Y-connected load of 900 W at a power factor of 0.8 leading. Calculate the line current and the per phase load impedance.

OR
 Q. No 3 Show by a phasor diagram that when three-phase balanced voltage sources are connected in delta formation, no current will flow round the loop so formed. Explain why delta-connected source is not used in practice.

Q. No.4

(a) Determine the Laplace transform of the waveform shown in Fig. 3

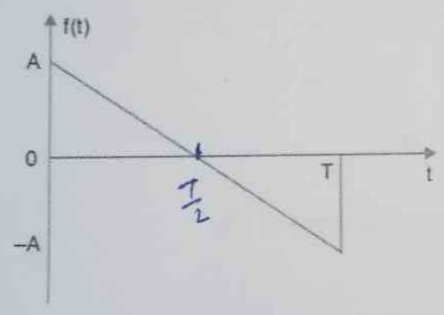


Fig. 3

(b) Draw the dual of the network in Fig. 4

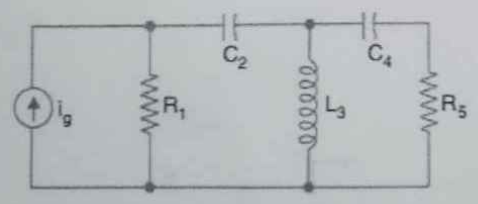


Fig. 4

OR

Q.No .4

(a) Derive the Laplace transform of the following functions:

(i) $\sinh at$

(ii) $1 - \exp(-at)$

$$\sinh at = \frac{e^{at} - e^{-at}}{2}$$

(b) The incidence matrix is given below as

Branches \Rightarrow	1	2	3	4	5	6	7	8
$A =$	1	0	0	0	1	0	0	1
	0	1	0	0	-1	1	0	0
	0	0	1	0	0	-1	1	-1
	0	0	0	1	0	0	-1	0

Draw the oriented graph.

Q. No.5 . Determine the Z, h- and Y-parameters of the network shown in Fig.5

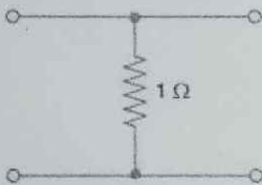


Fig. 5

OR

Q. No.5

(a) Show that when two two-port networks N_1 and N_2 are connected in parallel, the equivalent Y-parameter of the combined network is

$$Y_{equ} = Y_{N1} + Y_{N2}$$

(b) For the network shown in Fig.6 obtain the Z-parameters.

(c) Obtain the h-parameters of the network from the Z-parameters.

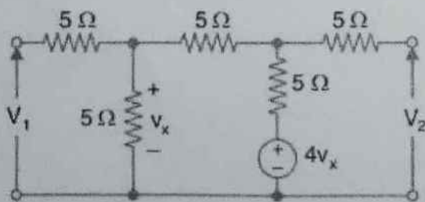
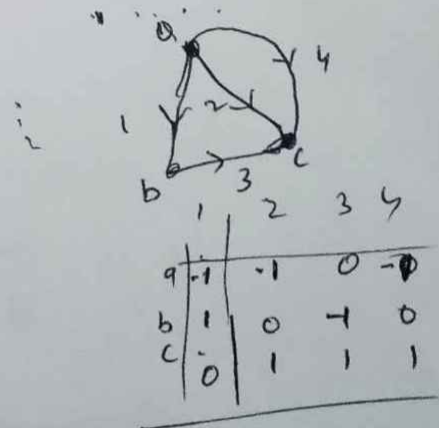


Fig. 6





Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes

2011/2/10 20000 Hz

Branch: All branch

Course Code: BT EE306A

Course Title: MEASUREMENTS AND INSTRUMENTATION

Max Time: 3hrs

Max Marks: 70

Instructions:

Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub Question carry two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

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KAUSHAL KUMAR GUPTA

Question No.1 Write short note on:

- (a) The Wien's bridges is suitable for the measurement of frequency of the range of
- (b) What is the mean by real, true and actual value in the network?
- (c) Megger is a type instrument.
- (d) What is the power factor?
- (e) The two watt meters used for the measurement of power input read 50 kW each. What will be the readings of the two watt meters if the power factor is changed to 0.8 leading keeping the total input power same?
- (f) Instruments measure the total quantity of electricity delivered at a particular time.
- (g) What is the role of bridges in the network?

PART -II

Unit-I

Question No.2 (a) How many methods used in instrument to providing controlling torque? Explain in details. (7)

Question No.2 (b) With the help of diagram explain the Classification of Instruments. (7)

Or

Question No.2 (a) Explain the Generalized Instrument with the help of block diagram. (7)

Question No.2 (b) Define the following terms: (a) Accuracy (b) Precision (c) Resolution (d) Threshold (e) Sensitivity (7)

Unit-II

Question No.3 (a) What is the voltmeter? Explain its construction and working. (7)

Question No.3 (b) How to work the Moving iron type Instruments? Explain in details. (7)

Or

Question No.3 How to extend the range of the ammeter and voltmeter? Explain in detail.(14)

Unit-III

Question No.4 (a) Discuss different types of frequency meters used in practice? (7)

Question No.4 (b) Explain how three phase power factor meters gives indications which are independent of waveform shape and frequency? (7)

Or

Question No.4 (a) With the help of diagram explain the construction and working of watt meter. (7)

Question No.4 (b) Explain the energy meter with detail. (7)

Unit-IV

Question No.5 What is the method of Kelvin's double bridge follow to measurement the low resistance? Explain in detail. (14)

Or

Question No.5 Write the short note of

a. Wein's bridges (7)

b. Hays Bridge (7)



Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE304A
Course Title: Electrical Machines 1

Max Time: 3 Hrs
Max Marks:70

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Instructions:

Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- Define MMF, Reluctance and Inductance?
- Write a short note on single and double excited systems?
- Distinguish between LAP and WAVE winding?
- Define efficiency of dc machine and give its losses?
- Why transformer rating is expressed in terms of kVA?
- Define voltage regulation of a transformer
- List the advantages of three – phase transformer over three single – phase transformers.

PART –II

Q. No.2 (a) Write a short note on the the influence of highly permeable materials on the magnetic flux lines.

(b) With the help of graph, explain the B-H curve of the magnetic materials. (7+7)

OR

Q. No.2 (a) Derive the expression for energy stored in the magnetic circuits.

(b) Distinguish between linear and non linear magnetic circuits. (7+7)

Q. No.3 (a) Discuss in detail, the load characteristics of DC Series and Shunt generators.

(b) A 440 V, 4-pole, 25 kW, dc generator has a wave-connected armature winding with 846 conductors. The mean flux density in the air-gap under the interpoles is 0.5 Wb/m² on full load and the radial gap length is 0.3 cm. Calculate the number of turns required on each interpole. (7+7)

OR

Q. No 3 (a) Explain the constructional features of DC generator in detail.

b) A 4-pole generator has a wave-wound armature with 722 conductors, and it delivers 100A on full load. If the brush lead is 80 calculate the armature demagnetizing and cross magnetizing ampere turns per pole. (7+7)

Q. No.4 (a) Explain the Brake test in a dc machine.

(b) A 200 V DC shunt motor with armature and field resistances of 0.25 ohm and 200 ohm respectively, takes a no load current of 5 A. If it takes 50 A under loaded conditions, find its efficiency as generator. (7+7)

OR

Q. No .4 (a) Explain about core and shell type of transformers and their relative merits with respect to other.

(b) Draw and explain the phasor diagram of single phase transformer on load considering with winding resistance. (7+7)

Q. No.5 (a) What is auto transformer? Explain the working principle of auto transformer.

(b) With the help of neat sketch, explain in detail about parallel operation of single phase transformers.

OR

Q. No.5 (a) Explain the concept of Scott connection (three phase to two phase) conversion with a neat circuit diagram.

(b) What is the significance of Y-Y, Y-delta and Delta-Y, Delta-Delta connections in 3-phase transformers?



Central University of Haryana
III-Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE302A
Course Title: Semiconductor Devices & Circuits

Max Time: 3 h
Max Marks: 70

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Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- (a) What is Tunneling?
- (b) What are the two mechanisms of breakdown in a P-N junction. Define both methods
- (c) A full wave rectifier has a peak output voltage of 25 volts at 50 Hz and feeds a resistive load of $1k\Omega$. The filter used is shunt capacitor one with $C=20\mu F$, Determine dc load current.
- (d) In common emitter B.J.T. configuration the voltage drop across load resistance of $1k\Omega$ is 1.2 V. Determine the base current. Given that $\beta = 60$.
- (e) Why is MOSFET called sometimes IGFET? What is the significant difference b/w the construction of an E-MOSFET and De-MOSFET?
- (f) Define CMMR? A differential amplifier has differential mode gain of 100 and a common-mode gain of 0.01. Calculate its CMRR in db.
- (g) What is the difference b/w a trainagular wave and a sawtooth wave?

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PART -II

Q. No.2 Derive relation b/w α and β for a common base transistor configuration.

A transistor is connected in common emitter configuration. Collector supply voltage V_{CC} is 10 volts, load resistance R_L is 800Ω , voltage drop across load resistance is 0.8 volt and current gain $\alpha=0.96$. Determine collector-emitter voltage and base current.

OR

Q. No.2 How can a voltage be doubled using a P-N junction diode and capacitor? Draw a schematic diagram of a voltage doubler circuit and explain how its various types work with their output waveforms.

Q. No.3 Explain construction of depletion and enhancement type of N-channel MOSFETs and explain its operation with the help of $(I_D - V_{DS})$ and $(I_D - V_{GS})$ characteristics.

OR

Q. No 3 Explain the small signal equivalent circuit of the common drain configuration of the MOSFET and derive its current & voltage gains and input & output impedances.

Q. No.4 Explain what do you understand by 'offset voltage' and 'offset current' of an operational amplifier. Discuss with a neat diagram the technique used for minimizing offset voltage and offset current in an inverting amplifier. Derive gain of the feedback inverting amplifier.

OR

Q. No .4 What are the properties of an ideal operational amplifier? Explain how it is used as (i) integrator and (ii) differentiator.

Q. No.5 Write short note on followings

- (a) Zero-crossing detector
- (b) Voltage Regulator

OR

Q. No.5 Write short note on followings

- (a) Instrumentation Amplifier
- (b) Hysteresis comparator

Handwritten notes and formulas:

- $q = \frac{1}{R} \int v dt$
- $v = \frac{q}{C}$
- $q = C \int i dt$
- $i = \frac{dq}{dt}$
- $q = \int i dt$
- $i = \frac{dq}{dt}$
- $i = C \frac{dv}{dt}$
- $I = \int v dt$

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PART-II

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- (b) Voltage Regulator

OR

Q. No.5 Write short note on followings

- (a) Instrumentation Amplifier
- (b) Hysteresis comparator

Handwritten notes and formulas:

- $\sigma = cV$
- $\frac{q}{C} = V$
- $\int I dt = Idq$
- $q = \int I dt$
- $\frac{dq}{dt} = I$
- $I = c \int V dt$
- $\frac{dI}{dt} = I$
- $I = c \int V dt$



Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes

Branch: Civil/Electrical/Printing packaging
Course Code: BT AUD 308 A
Course Title: Environmental Studies

Max Time: 3 Hrs
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- (a) Give the details account of Hot Spot of Biodiversity?
- (b) What is desert ecosystem discussed in details?
- (c) What is rain water harvesting discussed in detail?
- (d) Give the details account about environment ethics: issues and possible solutions?
- (e) Define the nuclear accident with an example?
- (f) Define is nitrogen cycle in environment with proper sketch?
- (g) How can you move from unsustainable to sustainable development?

PART -II

Q. No.2 Define the water pollution discuss in the details with source, effect and control measure?

OR

Q. No.2 Give the details about thermal water pollution? Discuss the issues of ground water pollution with sources, effect and control measure?

Q. No.3 Define the air pollution? Give the detailed account about source, effect and control of air pollution?

OR

Q. No 3 What is the land Resources, land degradation, land slide soil erosion and desertification? Discuss the environmental factor and effects on ecosystem?

Q. No.4 What are forest resources? Give the details account about the use and over exploitation, deforestation, how can we conserve the forest?

OR

Q. No .4 What is the minerals resources? Use and exploitation, environmental affects of mining?

Q. No.5 What is the ecosystem? Structure and functions of ecosystem? Define the energy flow in ecosystem with a model and ecological pyramid?

OR

Q. No.5 What is the food resources? Discussed the world food problems? How affect food issue to the environment and ecosystem?

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