

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Sixth Semester
HIGH VOLTAGE ENGINEERING
(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Name any two devices which are first directly affected by direct lightning stroke.
- 2 Write any two steps to reduce the overvoltage in a system.
- 3 State Pashen's law.
- 4 Name the various mechanism of breakdown in solid dielectrics.
- 5 What is the principle of Marx circuit?
- 6 Define Regulation.
- 7 State the role of Hall Effect generators.
- 8 What are the advantages of CVT?
- 9 Define disruptive discharge voltage?
- 10 What are the various HV test done on Bushings?

PART-B (5 x 16 = 80)

- 11 a. Explain the switching over voltages in EHV and UHV systems.

OR

- b. Discuss the various protective schemes for transmission line.

- 12 a. Explain the mechanism of breakdown in commercial liquids.

OR

- b. Derive Townsend's current growth equation. And explain the criterion for breakdown

- 13 a. What is impulse current? Explain the operation of impulse generator with diagram.

OR

- b. Explain the operations voltage multiplier circuits. And compare with voltage Doubler circuit.

- 14 a. Briefly explain how a sphere can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement?

OR

- b. A generating voltmeter has to be designed so that it can have a range from 20 to 200 KV DC. If the indicating meter reads a minimum current of $2\mu\text{A}$. What should the capacitance of the generating voltmeter be?

- 15 a. Classify and explain any one method of electrical test on circuit breakers.

OR

- b. Explain the partial discharge tests on high voltage cables. How does the fault identified in this test?

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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Seventh Semester
ELECTIVE - BIOMEDICAL INSTRUMENTATION
(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Define the process of Sodium Pump.
- 2 Mention the various Bioelectric Potentials.
- 3 Write the different applications of Op-Amp.
- 4 What is Epilepsy?
- 5 What are the methods involved in direct blood pressure measurement?
- 6 List the two methods of Pulse measurement.
- 7 Write the two types of Indicator Dilution Method.
- 8 Write down the characteristics of red blood cells.
- 9 How does the pH value determine the acidity of alkalinity in blood fluid?
- 10 What is Auto Analyzer?

PART-B (5 x 16 = 80)

- 11 a. Describe in detail about the basic component of a Biomedical System.
OR
b. Explain about LVDT Pressure transducers.
- 12 a. Discuss about different types of placement of electrodes in EEG measurement system and analysis of EEG waveforms.
OR
b. With a neat circuit diagram explain about Differential amplifier.
- 13 a. Explain about Temperature Measurement.
OR
b. Write short notes on Lung volumes and capacities.
- 14 a. Briefly explain about Hematocrit Determination.
OR
b. How the blood flow is measured using Doppler imaging.
- 15 a. Explain the principle of auto analyzer with a neat diagram.
OR
b. Write the detail notes on flame photometer.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Fifth Semester
POWER SYSTEM ANALYSIS
(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 The base kV and Base MVA of a 3 ϕ transmission line is 33kV and 10 MVA respectively. Calculate the base current and base impedance.
- 2 Mention the advantages of per unit computations.
- 3 Write the load flow equation of Gauss-Seidel method.
- 4 What do you mean by a flat voltage start?
- 5 For a fault at a given location, rank the various faults in the order of severity.
- 6 Write the relative frequency of occurrence of various types of faults.
- 7 Write the symmetrical components of three phase system.
- 8 Mention the generated equation to determine sequence line currents.
- 9 Give the expression for swing equation.
- 10 What is Multi machine stability?

PART-B (5 x 16 = 80)

- 11 a. A 15 MVA, 8.5KV, 3- phase generator has a sub transient reactance of 20%. It is connected through a Δ -Y transformer to a high voltage transmission line having a total series reactance of 70Ω . The load end of the line has Y-Y step down transformer. Both transformer banks are composed of 1 ϕ transformer connected for 3 ϕ operation. Each of three transformers composing 3 ϕ bank is rated 6667 KVA, 10/100 kV, with a reactance of 10%.The load represented as impedance is drawing 10MVA at 12.5kV and 0.8pf lagging .Draw the single line diagram of power network. Choose a base of 10MVA, 12.5kV in the load circuit and determine the reactance diagram. Determine also the voltage at the terminals of the generator.

OR

- b. Explain in detail about the successive elimination method to solve the unknown voltages of Y_{Bus} .
- 12 a. Compare NR Method, Gauss seidel method and Fast Decoupled Power Flow method of load flow studies.

(P.T.O)

OR

- b. Consider the three bus system. Each of the three lines has a series impedance of $0.02 + j0.08$ pu and a total shunt admittance of $j0.02$ pu. The specified quantities at the buses are tabulated. Controllable reactive power sources of available at bus 3 with the constraint . Find the load flow solution using the NR method. Use a tolerance of 0.01 for power mismatch.

Bus	Real load demand P_D	Reactive load demand Q_D	Real power generation P_G	Reactive power generation Q_G	Voltage specification.
1	2.0	1.0	Unspecified	Unspecified	$V_1 = 1.04 + j0$ (Slack bus)
2	0.0	0.0	0.5	1.0	Unspecified (PG Bus)
3	1.5	0.6	0.0	$Q_{G3}=?$	$ V_3 = 1.04$ (PV bus)

- 13 a. Explain the short circuit model of a synchronous machine under short circuit conditions.

OR

- b. A synchronous generator and motor are rated for 30,000KVA, 13.2KkV and both have sub transient reactance of 20%. The line connecting them has a reactance of 10% on the base of machine ratings. The motor is drawing 20,000KW at 0.8p.f leading. The terminal voltage of the motor is 12.8 kV. When a symmetrical three phase fault occurs at motor terminals, find the sub transient current in the motor, generator and at the fault point.
- 14 a. Derive an expression for the positive sequence current I_{a1} of an unloaded generator when it is subjected to a double line to ground fault.

OR

- b. Write the short notes on: i) Sequence Impedances. ii) Sequence networks.
- 15 a. Explain critical clearing time and critical clearing angle.

OR

- b. Briefly explain the importance of stability analysis in power system planning and operation.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Seventh Semester

ELECTIVE - HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 State the advantages of DC transmission.
- 2 Write the importance of converter station.
- 3 Draw the diagram graetz bridge circuit.
- 4 Define Constant α control.
- 5 State MTDC system.
- 6 Plot the series connected MTDC system.
- 7 What is meant by power flow analysis?
- 8 List out the control specification criteria of DC system.
- 9 Draw the equivalent circuit of single phase transformer
- 10 What are the requirements of a good simulation?

PART-B (5 x 16 = 80)

- 11 a. Explain the major components of an hvdc transmission in converter station unit.
OR
 b. Write the brief notes on VSC based HVDC transmission.
- 12 a. Explain briefly about detailed analysis of converters.
OR
 b. With the help of block diagrams explain briefly about system control hierarchy.
- 13 a. Compare series and parallel MTDC system.
OR
 b. Write briefly about voltage limiting control method with its necessary characteristics.
- 14 a. Explain briefly about DC network Modeling of DC link with its necessary equation and example.
OR
 b. Briefly explain about solution methodology of AC- DC Power flow with its necessary diagrams.
- 15 a. Draw the transformer model and explain briefly.
OR
 b. Explain briefly valve model and generation of control voltage.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Fifth Semester
MATHEMATICAL MODELING AND SIMULATION
(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 List out the mathematical matrix operations performed by MATLAB.
- 2 Define sub matrices
- 3 Define IF statement
- 4 What are the miscellaneous of simulation?
- 5 What is 2D plot?
- 6 Define dimensioned variables.
- 7 Define inverse matrix.
- 8 Compare mean-squared value with root mean squared value
- 9 Write some advantages of FFT?
- 10 List the types of filter.

PART-B (5 x 16 = 80)

- 11 a. What do you mean by array? List the types of array with its structure.

OR

b. Write short notes on (i) fopen (ii)fclose
- 12 a. State about "IF" statement. And explain how to construct this control statement.

OR

b. List and explain the basic arithmetic operations in the command window.
- 13 a. List the following in MATLAB application
(i) Line color (ii) Marker style (iii) Line style (iv) Legend command

OR

b. State and explain about polynomial functions with example
- 14 a. A function is given as $y = f(x) = x^3 - 6x^2 + 9x + 2$. Determine the finite value of x at which any local maxima and minima occur and determine the corresponding values of y.

OR

b. Define definite integral, list the different integration pairs with example
- 15 a. Write a program to compare linear and circular convolution of any two sequences with output diagram

OR

b. Explain briefly Digital Modulation and its technique

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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Seventh Semester
ELECTIVE - SPECIAL ELECTRICAL MACHINES
(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Mention the applications of vernier motor.
- 2 List out the primary design consideration of synchronous reluctance motor.
- 3 What are the types of stepper motors?
- 4 Mention the advantages of variable reluctance stepper motor.
- 5 What is the principle of switched reluctance motor?
- 6 Give the applications of switched reluctance motor.
- 7 Describe permanent magnet BLDC motor.
- 8 What is the meant by Peak recovery Current in PMBLDC motor?
- 9 List the advantages of permanent magnet synchronous motor over conventional synchronous motor.
- 10 List the purpose of opto isolation in power controller.

PART-B (5 x 16 = 80)

- 11 a. Describe the constructional features and principle operation of vernier motor

OR

b. Explain in detail about the magnetic equivalent circuit of a synchronous reluctance motor and derive an expression for the open circuit.
- 12 a. Describe in detail about the single and multi stack configuration

OR

b. Explain in detail about the non- linear analysis of stepper motor.
- 13 a. Discuss the microprocessor based control of switched reluctance motor in detail

OR

b. Draw and explain the power controller circuit for switched reluctance motor.
- 14 a. Explain the characteristics of permanent magnet BLDC motor and its control

OR

b. With a neat block diagram, explain about power controllers in PMBLDC motor.
- 15 a. Explain the volt-ampere characteristics of PMSM and its requirements

OR

b. With the help of schematic diagram explain the vector control for PMSM.

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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
Seventh Semester
ELECTRIC ENERGY GENERATION, UTILIZATION AND
CONSERVATION

(Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What are the Different methods of obtaining power tidal power stations?
- 2 Write the advantages of nuclear power plant?
- 3 Define Tariffs
- 4 State the various types of equipment that can cause power quality problems.
- 5 Explain M.S.H.P.
- 6 Why the carbon and tantalum preferred in the incandescent lamps?
- 7 What is Resistance heating?
- 8 Distinguish between direct and Indirect Heating Methods.
- 9 Define Adhesive Weight, Co-efficient of adhesion.
- 10 List out the advantages of Electrical braking.

PART-B (5 x 16 = 80)

- 11 a. With neat sketches explain solar power plant?

OR

- b. Write short notes on a)Super heater b)cooling tower
c)Air preheater d)condenser &Economizer

- 12 a. Explain the various types of tariff systems

OR

- b. Write short notes on
i)Energy conservation
ii)Energy Audit
iii)Energy management

- 13 a. How does an arc lamp functions? With the help of a neat sketch explain the automatic mechanism used for Lamps.

OR

- b. (i) Explain briefly about the operation of Flame Arc Lamp and Magnetic arc Lamp.
(ii) What is stroboscopic effect? How the problem is prevented in the fluorescentlamp.

(P.T.O)

14 a. What is Dielectric Heating? Explain with its neat sketch and advantage disadvantage and application.

OR

b. (i) Give a Detailed account of coreless induction Furnace on the basis of its constructional features and advantages.

(ii) What is the principle of Resistance Welding? Explain any 1 Method.

15 a. Draw a speed time curve of electrification and explain each constituent of it.

OR

b. Explain the Electrical vehicle control system with neat diagram

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VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. (PART TIME) DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
First Semester
ELECTRIC CIRCUIT ANALYSIS
 (Candidates admitted under 2017 Regulations-CBCS)

Time : Three Hours

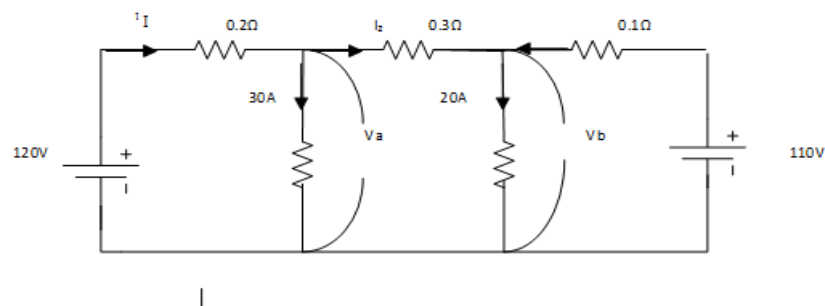
Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 State two salient points of a series combination of resistance.
- 2 What are ideal sources?
- 3 State Maximum power transfer theorem.
- 4 Write the equation to find the load current in Norton's theorem?
- 5 Compare series and parallel resonance circuits.
- 6 Short notes on analysis of coupled circuits.
- 7 Sketch the response of R-L DC circuit.
- 8 What are the effects of switching on resistor.
- 9 Give the three phase power expressions in terms of phase values.
- 10 What are zero sequence competence.

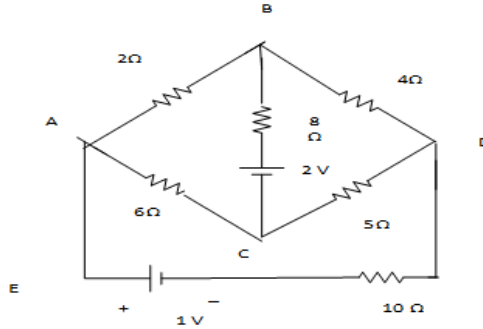
PART-B (5 x 16 = 80)

- 11 a. Explain the combination series of resistors and give application and disadvantage.
- OR**
- b. Find the current I_1, I_2 and I_3 and the voltage V_a and V_b in the network of figure by using nodal analysis.



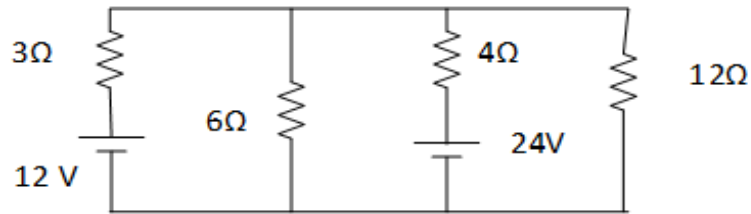
(P.T.O)

12 a. Using super position theorem ,obtain the current in E_A in figure below



OR

b. Using source transformation find the voltages and the current through $6\ \Omega$ and $12\ \Omega$ of the following circuits.



13 a. i) Write short on the series resonance and phasor diagram.
ii) Write short notes on parallel resonance circuit.

OR

b. Derive an expression of mutual inductance.

14 a. i) A series RLC circuits has $R=50\ \Omega, L=0.2\text{H}$ and $C=50\ \mu\text{F}$. constant voltage of 100V is impressed upon the Circuit at $t=0$. find the expression for the transient current assuming initially relaxed condition.
ii) A series RLC circuits has $R=20\ \Omega, L=10\ \text{H}$ and $C=5\ \text{F}$ has a constant voltage $V= 100\text{V}$ applied at $t=0$. Find the current response in the circuit, assuming zero initial condition.

OR

b. A series RLC circuit with $R=5\ \Omega, L=0.1\text{H}$ and $C=500 \times 10^{-6}\ \text{F}$ has a DC voltage of $100\ \text{v}$ applied at $t=0$ through a switch. Find the resulting current transient.

15 a. A balanced star connected load of $(3-j4)$ ohm impedance is connected to 400V three phase supply .what is the real power consumed?

OR

b. Write the expression balance star connection load and draw the phasor diagram.
