Question Bank

ME403: Advanced Energy Engineering

1. Explain the importance of renewable energy sources in current scenario of world energy consumption.
2. List any four advantages and disadvantages of nuclear energy.
3. Draw the general layout of a thermal power plant and explain the working of different circuits.
4. Distinguish between active and passive solar energy systems with neat sketches.
5. Describe the working principle of solar photovoltaic system with a simple figure.
6. Elaborate with sketches, any three types of concentrating collectors.
7. List any four advantages and disadvantages of solar energy.
8. Explain the working principle and components of horizontal axis wind turbine with sketches.
9. Illustrate the methods of collecting the annual wind data of a particular region.
10. Describe working and components of solar wind hybrid energy system with sketches.
11. Discuss the advantages and limitations of vertical axis wind turbines over horizontal axis wind turbines.
12. Explain various steps of pyrolysis process with schematic diagram.
13. List advantages and disadvantages of a fixed dome biogas plant.
14. Explain any two types of bio-chemical conversion process of biomass to energy.
15. Describe various stages in gasification process with a process flow chart.
16. Explain the components and layout of a geothermal energy harvesting system.
17. Describe four methods of storing hydrogen.
18. Explain any two types of wave energy conversion device with schematic diagram.
19. Describe any four sources of geothermal energy.
20. Explain any three types of fuel cell with schematic diagram.
21. List four advantages of geothermal energy over other forms.
22. Discuss the various causes and effects of ozone layer depletion.
23. List out the environmental impact of wave energy harvesting systems.
24. Explain any four air pollutants and their effects.
25. Suggest various measures to control global warming.
26. Explain the causes and effects of eutrophication.
27. List any four sources of land degradation.
28. What are the renewable energy resources? Discuss their importance in India's power requirement contest
29. Sketch the layout of a steam power plant. Explain briefly.
30. A central power plant has annual factors as load factor 65%, capacity factor 50% use factor 45%.Power station has a maximum demand of 15000kW. Determine (i) Annual energy production (ii) Reserve capacity (iii) Hours per year not in service.
31. Explain different types of solar collectors
32. Explain the difference between passive and active solar energy systems with neat sketches
33. How solar thermal power plants classified. List the methods for converting solar energy into electric power

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34. Explain the basic principle of wind energy conversion.
35. Discuss the advantages and disadvantages of wind energy conversion systems.
36. What are vertical axis wind turbines? Explain the construction and working of any one type of vertical axis wind turbine with the help of neat sketches.
37. Discuss the advantages of vertical axis wind turbines over horizontal axis wind turbines.
38. 'Biomass can be considered as a form of solar energy'. Discuss
39. Explain the category of biomass resources.
40. What are bio-fuels? Explain the classification of bio-fuels.
41. Explain the constructional details and working of a floating gas holder digester with the help of a neat sketch.
42. What are the advantages and disadvantages of a floating drum biogas plant?
43. Mention the impact of tidal energy power plants in the environment
44. Explain any four types of geothermal energy sources
45. With the help of a neat diagram explain the working principle and applications of fuel cells. (
46. Explain any four methods of hydrogen storage
47. With a neat sketch explain the working principle of any one type of wave energy conversion device
48. What are the harmful effects of acid rain? How does it cause?
49. Describe the wastewater treatment process with neat sketches.
50. List four measures to control ozone layer depletion
51. Explain any three methods for controlling air pollution by thermal power plants.
52. Briefly explain any four air pollutants and their effects
53. Explain the causes and effects of eutrofication.
54. Elaborate on the current global energy supply scenario.
55. With a neat sketch explain the layout and working of a diesel engine power plant.
56. Explain the working and components of a thermal power plant with the help of a neat layout.
57. Explain briefly about the different types of solar collectors with neat sketches.
58. Explain the working of solar photovoltaic cells.
59. Distinguish between active and passive solar energy systems.
60. List the components of a wind energy conversion system and explain its working.
61. List the different methods used to estimate wind speed at a location.
62. Elaborate on the construction and working of the different types of horizontal axis wind turbine.
63. What are the advantages of wind energy conversion systems?
64. Explain the construction and working of KVIC (floating type) bio gas plant.
65. Energy released from biomass, comes from sun', elaborate on this point.
66. List out the different types of biomass that are used as fuel.
67. Explain any one method of thermo-chemical conversion of biomass.
68. What is the advantage of converting bio mass to other forms over methods, where it is burnt directly?
69. With a neat sketch explain the working of a liquid dominated geothermal power plant.
70. Discuss briefly about the different geo thermal energy resources.

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71. With the help of a neat sketch explain the working principle of fuel cells and also its different applications.
72. Explain the working of any one type of wave energy conversion system with the help of a neat sketch.
73. Name the different processes used for hydrogen production.
74. Elaborate on the phenomenon of ozone depletion.
75. List out the various environmental impacts of setting up hydro electric power plant.
76. Explain briefly about the conditions which will lead to acid rain and also the harmful effects of acid rain.
77. Explain how eutrophication affects aquatic life.
78. List some of the common sources of land degradation.
79. Describe causes for the loss of bio-diversity due to energy conversion process.
80. Sketch the layout of a diesel power plant. Explain the layout.
81. Discuss the renewable energy potential of India.
82. Give the schematic layout of a gas turbine power plant and explain it's working with the help of Brayton cycle.
83. Discuss the various types of concentrating collectors
84. Explain the working of a flat plate collector with a neat sketch.
85. List out the advantages and disadvantages of photovoltaic cells.
86. Explain with a neat sketch solar pond electric power plant.
87. What are advantages and disadvantages of wind energy?
88. What do you mean by (1) Yaw control (2) Rated wind speed with respect to wind turbines?
89. Discuss site selection for wind power plants? (6) b) How are wind turbines classified?
90. What are the advantages of using biomass as an energy source?
91. Which are the main sources of Biomass?
92. With a neat sketch explain the working of a fixed dome type biogas plant.
93. Write a short note on gasification of biomass?
94. Discuss micro hydro power plants.
95. Explain the components of a Tidal power plants.
96. With a schematic layout describe hot dry rock system of geothermal energy?
97. What are the disadvantages of using geothermal energy?
98. With the help of a schematic diagram explain the closed cycle MHD?
99. What are the chemical reactions involved in hydrogen-oxygen fuel cells?
100. What is thermal pollution? List the harmful effects of thermal pollution.
101. What is eutrophication? Why is it undesirable?
102. What is biodiversity?
103. What is cause for the loss of biodiversity and how is biodiversity protected?
104. Describe the actions to be taken for sustainability of energy.
105. What do you mean by sustainable energy?

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: ME403
Course Name: ADVANCED ENERGY ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1 a) What are the renewable energy resources? Discuss their importance in India's power requirement contest. (5)

b) Sketch the layout of a steam power plant. Explain briefly. (5)

2 a) A central power plant has annual factors as load factor 65%, capacity factor 50% use factor 45%.Power station has a maximum demand of 15000kW. Determine (i) Annual energy production (ii) Reserve capacity (iii) Hours per year not in service. (10)

3 a) Explain different types of solar collectors (6)

b) Explain the difference between passive and active solar energy systems with neat sketches (4)

4 a) How solar thermal power plants classified. List the methods for converting solar energy into electric power (10)

PART B

Answer any three full questions, each carries 10 marks.

5 a) Explain the basic principle of wind energy conversion. (5)

b) Discuss the advantages and disadvantages of wind energy conversion systems. (5)

6 a) What are vertical axis wind turbines? Explain the construction and working of any one type of vertical axis wind turbine with the help of neat sketches (7)

b) Discuss the advantages of vertical axis wind turbines over horizontal axis wind turbines. (3)

7 a) 'Biomass can be considered as a form of solar energy'. Discuss (2)

b) Explain the category of biomass resources. (3)

c) What are bio-fuels? Explain the classification of bio-fuels. (5)

8 a) Explain the constructional details and working of a floating gas holder digester with the help of a neat sketch. (6)

b) What are the advantages and disadvantages of a floating drum biogas plant? (4)

PART C

Answer any four full questions, each carries 10 marks.

9 a) Mention the impact of tidal energy power plants in the environment (4)

b) Explain any four types of geothermal energy sources (6)

10 With the help of a neat diagram explain the working principle and applications of fuel cells. (10)

11 a) Explain any four methods of hydrogen storage (4)

b) With a neat sketch explain the working principle of any one type of wave energy conversion device (6)

12 a) What are the harmful effects of acid rain? How does it cause? (4)

b) Describe the wastewater treatment process with neat sketches. (6)

13 a) List four measures to control ozone layer depletion (4)

b) Explain any three methods for controlling air pollution by thermal power plants. (6)

14 a) Briefly explain any four air pollutants and their effects (4)

b) Explain the causes and effects of eutrofication (6)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: ME403

Course Name: ADVANCED ENERGY ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1 a) Explain briefly global energy resources. (7)

b) How do Industry Nation and Globe would benefit from energy efficiency programs (3)

2 a) Give the schematic layout of a thermal power plant and explain its working with the help of Rankine cycle (10)

3 a) What are the different solar thermal electric systems? Explain (6)

b) List any four advantages and disadvantages of solar energy (4)

4 a) Explain Active and Passive solar systems (4)

b) Briefly explain the types of concentrating solar thermal power plants (6)

PART B

Answer any three full questions, each carries 10 marks.

5 a) Explain the main considerations in selecting a site for wind energy converters. (3)

b) How wind turbines are classified? Explain the construction and working of a horizontal axis wind turbine with the help of neat sketches (7)

6 a) Write notes on solar-wind hybrid systems (5)

b) Discuss the environmental impact of wind turbines (5)

7 a) Explain the biochemical and thermo chemical methods of biomass conversion (7)

b) What is the difference between biomass and biogas? (3)

8 a) Explain the constructional details and working of a fixed dome digester with the help of a neat sketch. (6)

b) What are the advantages and disadvantages of a fixed dome biogas plant? (4)

PART C

Answer any four full questions, each carries 10 marks.

9 a) List four advantages of geothermal energy over other forms (4)

b) Explain the working principle of MHD power generation with a sketch (6)

B

10 a) What are the various components in hydrogen generation? Explain in detail.

11 a) List any four applications of fuel cells

b) Explain the components and working principle of any one hybrid power plant with sketches

12 a) Define Global warming. What are the reasons for Global warming?

13 a) List out the environmental impact of utilizing hydro electric power

b) Explain the causes and effects of enhanced green house effect

14 a) List any four sources of land degradation

b) Describe any six causes for the loss of biodiversity

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

EC407 Computer Communication

Question Bank

1. a) Discuss in detail the different attacks in data networks

   b) Explain the various security services provided on the network?

   c) Explain the services provided by SSL protocol.

2. a) Explain the various methods used in transport layer to overcome the limitations of the network layer

   b) With help of diagrams, explain the various scheduling methods to improve the Qos in a network

   c) Write short notes on (i) SNMP (ii) POP3

3. a) why TCP is called as connection orientated reliable transport layer protocol?

   b) What are the difference between the services provided by TCP and UDP?

   C) Explain congestion control measures used in the transport layer.

4. a) Explain the functionality of (i) MIME (ii) SMTP (iii) HTTP

   b) Explain the handshake protocol used in SSL.

   c) What is IPsec? Explain the two modes of operation of IPsec

5. a) Explain the services offered by TCP to the processes at the application layer

   b) With the help of a diagram, explain how users download the E-mail Message using POP3

   c) Explain the need of the second layer of defence in a secured Network environment.

6. a) Draw the TCP segment header format. Explain the various fields in the TCP

   b) What are the main features of UDP? Explain.

   c) Explain the various congestion control mechanisms to alleviate congestion after it happens.

7. a) List the differences between distance vector and link state routing protocols.

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b) Give any example of distance vector routing algorithm and prepare the routing table for each node.

8. a) what are the problems associated with distance vector protocols. How is it overcome in other routing protocols?

b) How can we distinguish a multicast address in IPv4 addressing? How can we do so in IPv6 addressing?

9. a) Explain how error control is done in the data link layer. Give an example

b) Explain different flow control mechanisms adopted by data link layer

10. a) Write in detail how all the layers in OSI model working together for networking

b) Differentiate circuit switching and packet switching.

11. a)What is meant by data communication and explain the different types of data transmission?

b) Write short notes on types of transmission modes

12. a)What are the Categories of networks? Explain?

b)Write short notes on interconnection of the network with an example

13.a)How the transmission media is classified? Discuss various varieties of twisted pair cable

b) Write the key difference between UTP and STP cables

14.a)Write short notes on co-axial cable and also discuss different co-axial cable connectors.

b)Draw the optical fiber structure and explain the purpose of the core, cladding and buffer coating.

15.a)Explain the stop-and-wait and Go-Back-n techniques of error control ARQ

b) Discuss the various configuration, mode and frame types of HDLC in detail

16.a) Draw the basic structure of circuit switched network and explain the various types of multi path switching with neat diagram?

b) Explain the concept of Time-slot interchange with neat diagram?

17.a) Draw the frame format of CSMA/CA method and Explain?

b) How Collision is avoided in CSMA/CA? Give the suitable techniques (any two)

18.a)What is unguided transmission media and explain the various types of unguided transmission

b) Discuss the advantages and disadvantages of optical fiber cable

19.a) Draw the structure of TCP/IP reference model and explain the five layers function in detail

b) Compare the virtual circuit approach and datagram approach with an example

20.a) Distinguish the stop-and-wait and sliding window for flow control

b) Write short notes on bit stuffing with suitable diagram

21.a) Explain the various types of space-division switching with neat diagram

b) Explain the various types of Time-division switching with neat diagram

22.a)Explain in detail about the access method and frame format of IEEE 802.3 standard network

b)With neat sketch, write the different categories of baseband of IEEE 802.3 standard network

23.a) Draw the architecture of IEEE 802.11 and explain

b) Compare Wireless LAN and IEEE 802.11

24.a) What is the number of bits in an IPv4? Discuss various categories of Classful addressing?

b) Write short notes on various types of notation performing in the networks?

25.a)What is meant by ICMP? Explain the various type of error message occur in the ICMP protocol?

b) Draw the message format of ICMP protocol? Discuss the different types of query message in ICMP Protocol

26.a) List the differences between distance vector and link state routing protocols.

b) Prepare a routing table for each node using the distance vector algorithm and find out which is a least cost route to send the packets A to D?

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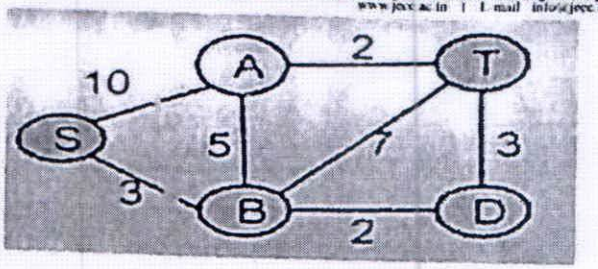
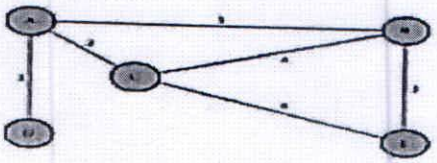


27.a) Prepare a routing table for each node using the distance vector algorithm and find out which is a least cost route to send the packets C to D?



b) Draw the flow chat of Dijkstra's algorithm? Write the procedure for implementation of Dijkstra's algorithm and give the suitable example

28.a) How to connected if one of the organizations is not geographically close to the other three? Give the example

b) Why we are going to address aggregation method? Explain in detail and Give the suitable example

29.a)Define hop? Explain the Next-Hop Method Versus Route Method with a suitable example?

b)Compare the concept of Network-Specific Method Versus Host-Specific Method and default method with an example?

30.a) How ARP used for in networking? explain the working operation of ARP protocol

b) Differentiate four Different Cases using ARP protocol with neat diagram?

(Ponmani Raja)

Signature of faculty

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HOD, ECE

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G192070 Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: EC407

Course Name: COMPUTER COMMUNICATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

			Marks
1	a)	With a suitable diagram explain the fundamentals of OSI model.	(10)
	b)	Explain about byte stuffing with example.	(5)
2	a)	Explain the frame format in HDLC protocol.	(8)
	b)	Explain about TCP/IP protocol suite.	(7)
3	a)	Explain about simplex, half duplex and full duplex communication.	(3)
	b)	Explain how collision is handled in CSMA/CD.	(8)
	c)	Compare circuit switching and packet switching.	(4)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Explain about ICMP. How is error reporting possible in ICMP.	(8)
	b)	Explain the forwarding of packet in network layer.	(7)
5	a)	Explain subnetting and super netting. How do the subnet mask and supernet mask differ from a default mask in classful addressing?	(8)
	b)	Explain Link State Routing using Dijkstras algorithm with an example.	(7)
6	a)	What is VLAN? Explain its configurations.	(8)
	b)	Explain Routing Information Protocol with an example.	(7)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Explain about open loop and closed loop congestion control mechanisms.	(10)
	b)	Write note on (a) PGP (b) TLS	(6)
	c)	Explain about firewall and its types.	(4)
8	a)	With necessary diagram explain the features of UDP.	(8)
	b)	Explain the various intrusion detection systems.	(6)
	c)	Explain the TCP segment format.	(6)

9 a) Explain any four common attacks in networks. (8)

b) Explain how Telnet establishes connection to a remote system. (6)

c) Explain about IPSec and its modes. (6)

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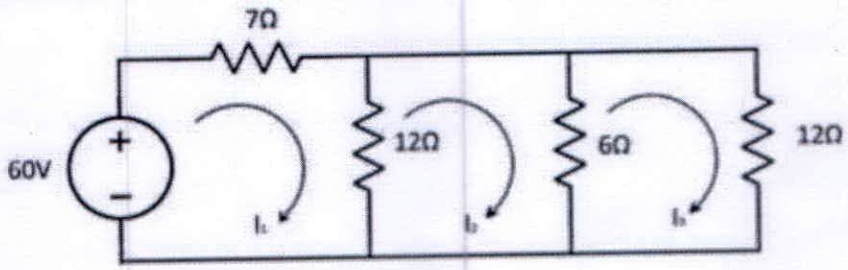
EE 209 ELECTRICAL TECHNOLOGY

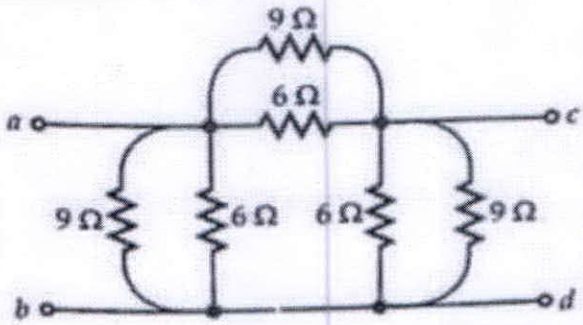
Question Bank

MODULE - I

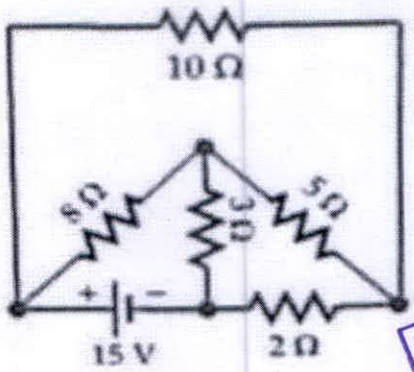
1. Determine mesh current I_1, I_2, and I_3 in the circuit. Calculate current through 6Ω resistor (January - 2017)



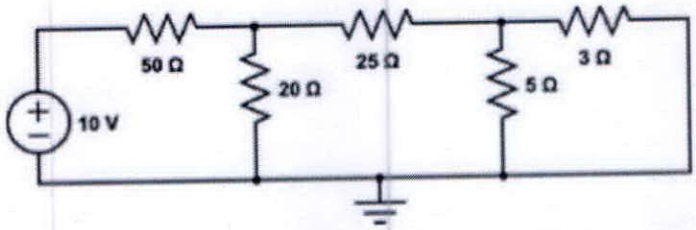
2. Find the equivalent star network. (July - 17)



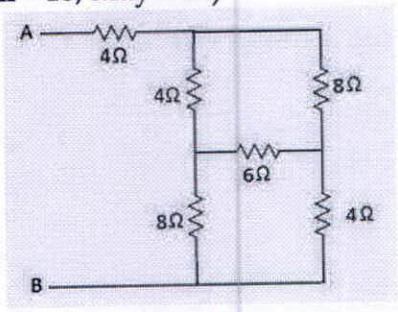
3. What is the power lost in 10Ω resistor in the network shown below? Use mesh method. (July - 17)



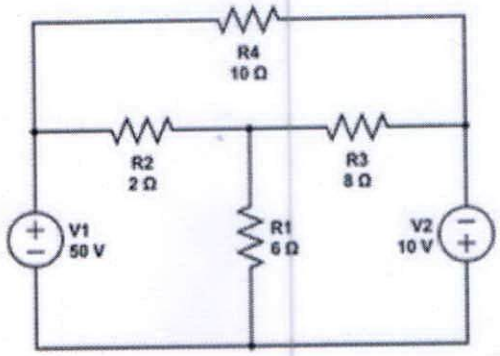
4. Three resistances of 3Ω, 4Ω and 5Ω are connected in parallel and this combination is put in series with 2Ω resistor. a) Find the equivalent resistance of the combination b) Obtain the current in the circuit when a battery of 10V with internal resistance of 0.1Ω is connected across the combination. (Dec - 17)
5. Find node voltages of the given network using nodal analysis (Dec - 17, May - 19)



6. Find the equivalent resistance across the terminal A and B using star delta conversion method. (April - 18, May - 19)

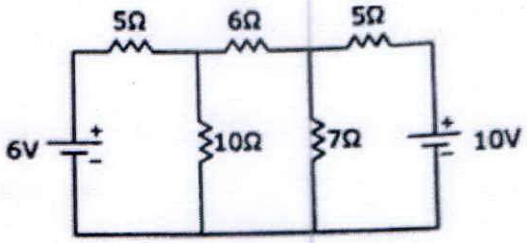


7. Find the power loss in 10Ω resistor in the network shown below using mesh analysis. (April - 18)

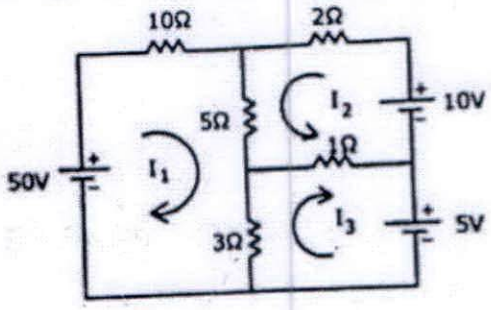


8. Explain in detail about delta to star conversion. (Dec -18)

9. Find the node voltage V_1 and V_2 using nodal analysis for the given circuit. (Dec - 18)

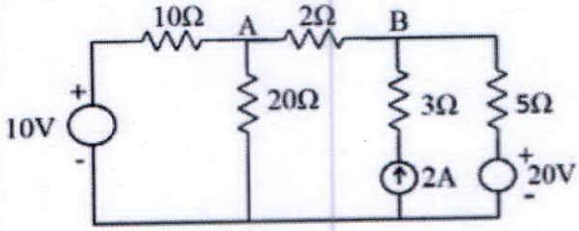


10. Find I_3 through mesh analysis for the following figure. (Dec – 18)

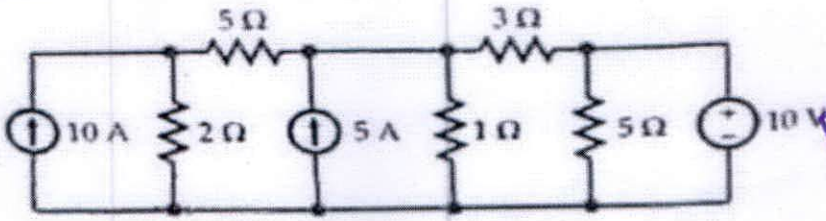


MODULE – II

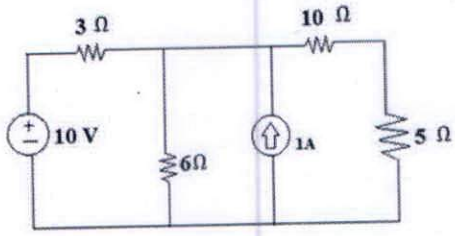
1. State Thevenin's theorem and illustrate with an example. (Jan – 17, Dec – 17)
2. Find voltage across 2 Ω resistor by using super position theorem. (Jan - 17)



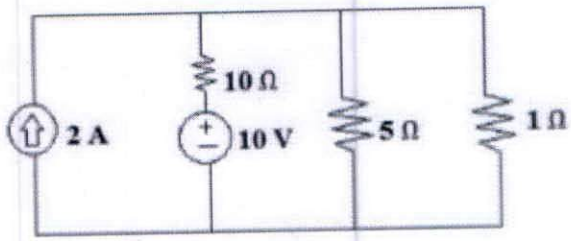
1. Define maximum power transfer theorem and obtain the condition for maximum power transfer. (July – 17, April – 18, Dec – 18, May - 19)
2. Find the current in the 3Ω resistor by Thevenin's theorem. (July - 17)



3. Find the current in 5Ω resistor for the circuit given below using Norton's theorem (Dec – 17)



4. Find the power loss in 1 Ω resistor by Thevenin's Theorem. (April – 18)



5. Define super position theorem and write its steps to solve the problems. (Dec -18)
6. State Thevenin's theorem. Mention the steps for solving Thevenin's theorem. (May – 19)

MODULE – III

1. What is series resonance? Derive expression for resonant frequency. (Jan – 17, Dec – 17)
2. How can 3 phase power measurement be done by two wattmeter method? (Jan – 17, Dec – 18, May -19)

1. Derive relation between phase voltage and line voltage in star connected system. (Jan – 17, May - 19)
2. Sketch how parameters of a series RLC circuit vary with frequency. Define Q factor and bandwidth of series resonant circuit. (July - 17)
3. Three identical coils, each having a resistance of 10Ω and reactance of 10Ω are connected in (i) star and (ii) delta, across a 400V 3phase supply. Find in each case, the line current and readings on each of the two wattmeters connected to measure the power. (July - 17)
   Derive line and phase current relationship in delta connected three phase system with the help of phasor diagram. (July – 17, Dec – 17)

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4. Compare parallel and series resonance. (Dec – 17, May – 19)
5. What is parallel resonance? Derive expression for resonant frequency of the parallel RLC circuit. (April – 18)
6. Define bandwidth and Q factor of series resonating circuit. (April – 18)
7. Three coils each having an impedance of (8+6j)Ω are connected in (1) star and (2) delta across 400V, 3 phase line. Calculate the line current and total power for each case. (April – 18)
7. Define resonant circuit. Derive the expression for find resonance frequency of RLC series circuit. (Dec -18)

MODULE – IV

1. Explain working principle of DC motor. (Jan - 17)
2. What is the necessity of starter in dc motor? (Jan – 17, April – 18, May - 19)
8. Derive expression for emf equation of dc generator. (Jan – 17, July – 17, (Dec -18)
3. A four pole dc generator, having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming flux per pole to be 0.007 Wb. (Jan – 17)
4. Draw and explain different characteristics of DC shunt motor. (July - 17)
5. A 100 h.p., 500V shunt motor has 4poles and a 2 circuit wave winding with 492 armature conductors. The flux is 50mWb per pole and the full load efficiency 92%. The armature and commutating field winding have a total resistance of 0.1Ω. The armature field resistance is 250Ω. Calculate for full load (i) the speed (ii) the useful torque. (July - 17)
6. Explain different types of DC motor (Dec -17)
7. Explain constructional details of a DC machine. (Dec -17)
8. With neat sketch explain the working principle and derive EMF equation of DC generator. (Dec -17)
9. A 4 pole, 500 V shunt motor has 720 wave connected conductors in the armature. The full load armature current is 60A and the flux per pole is 0.03 Weber. The armature resistance is 0.2Ω and the contact drop is 1V per brush. Calculate the full load speed of the motor. (Dec -17)
10. Explain the different power stages of DC motor (April – 18, May – 19)

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11. Draw and explain OCC of a separately excited DC generator. (April – 18, May – 19)
12. With neat sketch, explain 3 point starter. (April – 18, May – 19)
13. Derive the torque equation of DC motor. (Dec – 18)
14. Explain back emf and its significance. (Dec – 18)

MODULE – V

1. Explain working principle of transformer. (Jan - 17)
2. Draw and explain torque – slip characteristics of three phase induction motor
3. Derive emf equation of transformer. (Jan – 17, April – 18)
4. A 25 kVA transformer has 500 turns on the primary and 50 turns on secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, secondary emf and maximum flux in core. Neglect leakage drops and no load primary current. (Jan - 17)
5. Draw and explain vector diagram of transformer on no load condition. (Jan - 17)
6. What is the working principle of three phase induction motor? (Jan - 17)
7. A three phase induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate (i) synchronous speed (ii) rotor speed when slip is 4% (iii) rotor frequency when rotor runs at 600 rpm. (Jan - 17)
8. Draw the power stages in an induction motor. (Jan – 17. Dec -17)
9. Draw and explain phasor diagram of practical transformer with Inductive load. (July - 17)
10. Explain auto transformer starter for three phase Induction motor. (July - 17)
11. With the help of necessary diagrams give the constructional details of a transformer. (July - 17)
12. The Power input to the rotor of a 440V, 50Hz, 3 phase, 6 pole induction motor is 60 kW. It is observes that the rotor emf makes 90 complete cycles per minute. Calculate (i) the slip (ii) rotor speed (iii) rotor copper loss and (iv) mechanical power developed. (July - 17)
13. Explain the necessity of starter in three phase Induction Motor. Name any 4 starting methods. (July – 17, Dec - 18)
14. Narrate the properties of ideal transformer. Sketch its phasor diagram (Dec -17, May – 19)
15. Explain the construction, operation and working principle of transformer. (Dec - 17)
16. Why transformer is rated in kVA. (Dec -17)

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17. The input power to a 6 pole 3 phase 50Hz induction motor is 42 kW. The speed is 970 rpm. The stator losses are 1.2 kW and the friction and windage loss is 1.8kW. Find i) rotor copper losses ii) efficiency of the motor. (Dec -17)
18. Explain how rotating magnetic field is produced in three phase induction motor. (April – 18)
19. An ideal 25kVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50Hz supply. Calculate: i) Primary and secondary currents on full load ii) Secondary EMF iii) Maximum core flux. (April – 18, May – 19)
20. Explain any 5 types of starting methods of 3 phase induction motor. (April – 18)
21. Explain in shortly about transformer losses (Dec – 18)
22. Explain the construction of transformer. (May – 19)

MODULE – VI

1. Why is single phase induction motor not self-starting? How can it be made self-starting? (Jan - 17)
2. How do servomotors differ in application capabilities from large industrial motors? (Jan - 17)
3. Explain construction, operation and applications of universal motor. (Jan - 17)
4. Why is synchronous motor not self-starting? (Jan - 17)
5. What are features of stepper motor? What is step angle? What are its applications? (Jan - 17)
6. Explain capacitor start and capacitor run induction motor. (Jan – 17)
7. Give the construction of Universal motor. (July – 17, April – 18)
8. With necessary diagrams explain the construction of AC servomotor. (July - 17)
9. State and explain double field revolving theory. Also explain the operation of single phase Induction motor by double field revolving theory. (July - 17)
10. Explain the working principle of synchronous motor. (July - 17)
11. Explain capacitor start single phase Induction motor. (July – 17, Dec – 17)
12. Give some applications of synchronous motor (Dec – 17, May – 19)
13. Explain the construction & working principle of single phase induction motor. (Dec – 17, April – 18, Dec – 18, May – 19)
14. Explain the working principle of servo motor and mention some of its applications. (Dec – 17, May – 19)
15. Explain universal motor in detail. (Dec – 17)
23. Explain different types of single phase induction motor. (April – 18)

24. Explain stepper motor and its applications. (April – 18, May – 19)
16. Explain shortly about stepper motor and its types. (Dec – 18)
17. Explain the working concept of synchronous motor with its advantages, disadvantages and applications. (Dec – 18)
18. Why single phase induction motor is not self-starting? Explain different types of single phase induction motor. (May – 19)

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Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

Course Code: **EE 209**

Course Name: **ELECTRICAL TECHNOLOGY (MC)**

Max. Marks : 100 Duration : 3 Hours

Instructions: Write units in all numerical answers

PART A

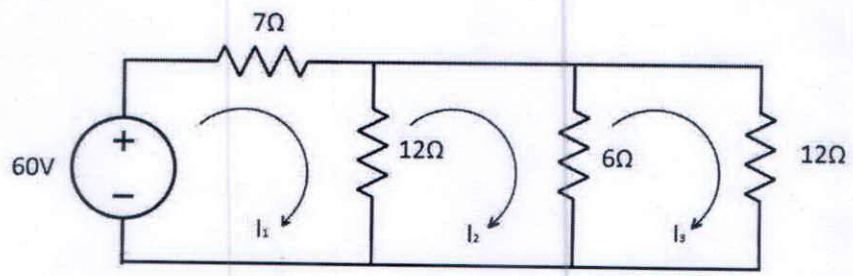
Answer all questions. Five marks each

1. What is the relation between power factor and energy?
2. State Thevenin's theorem and illustrate with an example.
3. What is series resonance? Derive expression for resonant frequency.
4. Explain working principle of DC motor.
5. Explain working principle of transformer.
6. Draw and explain torque – slip characteristics of three phase induction motor.
7. Why is single phase induction motor not self starting? How can it be made self starting?
8. How do servomotors differ in application capabilities from large industrial motors.

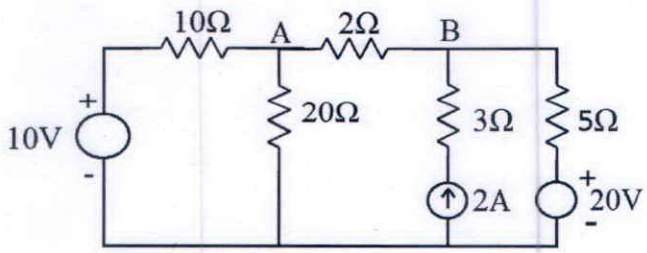
PART B

Answer any 3 full questions. Ten Marks each

9. Determine mesh current I_1, I_2, and I_3 in the circuit. Calculate current through 6Ω resistor (10)



10. Find voltage across 2 Ω resistor by using super position theorem. (10)



11. How can 3 phase power measurement be done by two wattmeter method? (10)

12. (a) What is the necessity of starter in dc motor? (4)

(b) Derive expression for emf equation of dc generator. (6)

13. (a) Derive relation between phase voltage and line voltage in star connected system(6)

(b) A four pole dc generator, having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming flux per pole to be 0.007 Wb. (4)

PART C

Answer any 2 full questions. 15 Marks each

14. (a) Derive emf equation of transformer. (5)

(b) A 25 kVA transformer has 500 turns on the primary and 50 turns on secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, secondary emf and maximum flux in core. Neglect leakage drops and no load primary current. (5)

(c) Draw and explain vector diagram of transformer on no load condition (5)

15. (a) What is the working principle of three phase induction motor (6)

(b) A three phase induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate (i) synchronous speed (ii) rotor speed when slip is 4% (iii) rotor frequency when rotor runs at 600 rpm. (5)

(c) Draw the power stages in an induction motor. (4)

16. (a) Explain construction, operation and applications of universal motor (10)

(b) Why is synchronous motor not self starting? (5)

17. (a) What are features of stepper motor? What is step angle? What are its applications (10)

(b) Explain capacitor start and capacitor run induction motor. (5)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: **EE209**

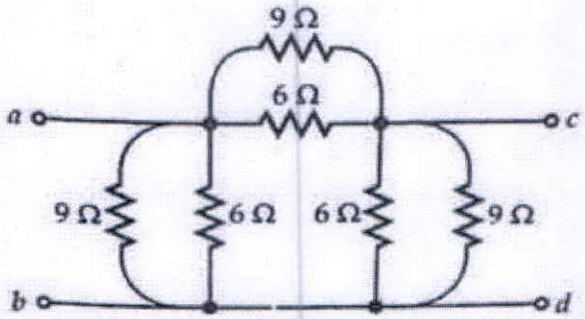
Course Name: **ELECTRICAL TECHNOLOGY (MC)**

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, 5 marks each.

1. Find the equivalent star network (5)

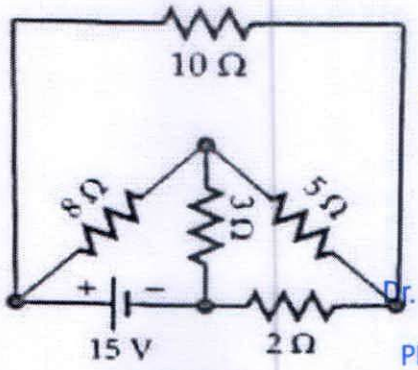


2. Define maximum power transfer theorem and obtain the condition for maximum power transfer. (5)
3. Sketch how parameters of a series RLC circuit vary with frequency. Define Q factor and bandwidth of series resonant circuit. (5)
4. Derive the emf equation of DC generator. (5)
5. Draw and explain phasor diagram of practical transformer with Inductive load. (5)
6. Explain auto transformer starter for three phase Induction motor. (5)
7. Give the construction of Universal motor (5)
8. With necessary diagrams explain the construction of AC servomotor. (5)

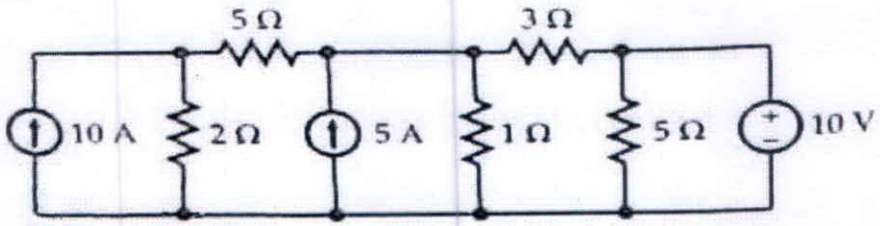
PART B

Answer any 3 questions, 10 marks each.

9. What is the power lost in 10Ω resistor in the network shown below? Use mesh method.



10. Find the current in the 3Ω resistor by Thevenin's theorem.



11. Three identical coils, each having a resistance of 10Ω and reactance of 10Ω are connected in (i) star and (ii) delta, across a 400V 3phase supply. Find in each case, the line current and readings on each of the two wattmeters connected to measure the power.

12. a. Derive line and phase current relationship in delta connected three phase system with the help of phasor diagram. (5)

    b. Draw and explain different characteristics of DC shunt motor. (5)

13. A 100 h.p., 500V shunt motor has 4poles and a 2 circuit wave winding with 492 armature conductors. The flux is 50mWb per pole and the full load efficiency 92%. The armature and commutating field winding have a total resistance of 0.1Ω. The armature field resistance is 250Ω. Calculate for full load (i) the speed (ii) the useful torque.

PART C

Answer any 2 questions, 15 marks each.

14. a. With the help of necessary diagrams give the constructional details of a transformer. (5)

    b. The Power input to the rotor of a 440V, 50Hz, 3 phase, 6 pole induction motor is 60 kW. It is observes that the rotor emf makes 90 complete cycles per minute. Calculate (i) the slip (ii) rotor speed (iii) rotor copper loss and (iv) mechanical power developed. (10)

15. a. Explain the speed control of 3-phase induction Motor using Kramer system (10)

    b. Explain the necessity of starter in three phase Induction Motor. Name any 4 starting methods. (5)

16. State and explain double field revolving theory. Also explain the operation of single phase Induction motor by double field revolving theory. (15)

17. a. Explain the working principle of synchronous motor. (10)

    b. Explain capacitor start single phase Induction motor (5)

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Total Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: EE209

Course Name: ELECTRICAL TECHNOLOGY (MC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

1 Three resistances of 3Ω, 4Ω and 5Ω are connected in parallel and this combination is put in series with 2Ω resistor. a) Find the equivalent resistance of the combination b) Obtain the current in the circuit when a battery of 10V with internal resistance of 0.1Ω is connected across the combination. (5)

2 State Thevenin's theorem. Illustrate it with an example. (5)

3 What is series resonance? Derive expression for resonant frequency of the series RLC circuit. (5)

4 Explain different types of DC motor. (5)

5 Narrate the properties of ideal transformer. Sketch its phasor diagram (5)

6 Draw and explain the power stages of 3 phase induction motor. (5)

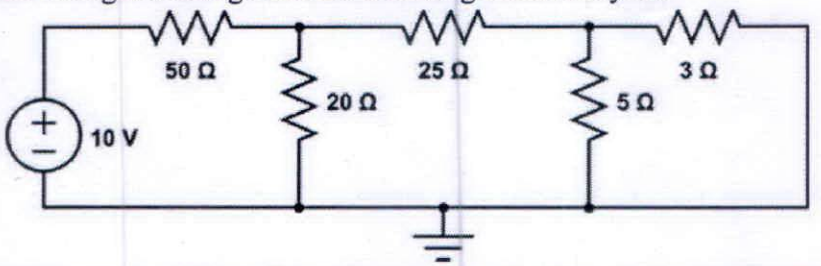
7 Give some applications of synchronous motor. (5)

8 Explain the working principle of single phase induction motor. (5)

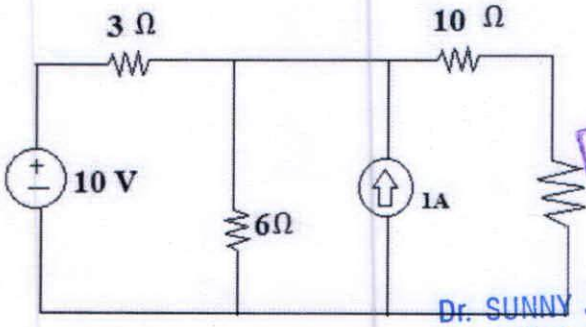
PART B

Answer any three full questions, each carries 10 marks.

9 a) Find node voltages of the given network using nodal analysis. (10)



10 Find the current in 5Ω resistor for the circuit given below using Norton's theorem. (10)



11 a) Derive relation between phase current and line current in a delta connected system. (5)

b) Compare parallel and series resonance. (5)

12 a) Explain constructional details of a DC machine. (5)

b) With neat sketch explain the working principle and derive EMF equation of DC generator. (5)

13 A 4 pole, 500 V shunt motor has 720 wave connected conductors in the armature. The full load armature current is 60A and the flux per pole is 0.03 Weber. The armature resistance is 0.2Ω and the contact drop is 1V per brush. Calculate the full load speed of the motor. (10)

PART C

Answer any two full questions, each carries 15 marks.

14 a) Explain the construction, operation and working principle of transformer. (10)

b) Why transformer is rated in kVA. (5)

15 a) Explain a method of speed control in three phase induction motor. (5)

b) The input power to a 6 pole 3 phase 50Hz induction motor is 42 kW. The speed is 970 rpm. The stator losses are 1.2 kW and the friction and windage loss is 1.8kW. Find i) rotor copper losses ii) efficiency of the motor. (10)

16 a) Explain the working principle of servo motor and mention some of its applications. (10)

b) Explain capacitor start single phase induction motor. (5)

17 Explain universal motor in detail. (15)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: EE209

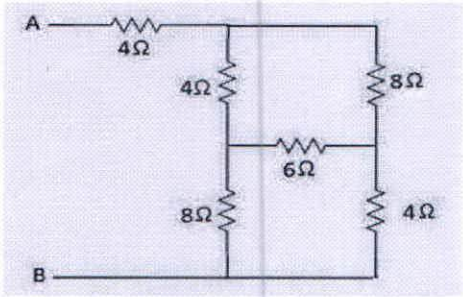
Course Name: ELECTRICAL TECHNOLOGY (MC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks Marks

1 Find the equivalent resistance across the terminal A and B using star delta conversion method. (5)



2 State Maximum Power Transfer Theorem. Derive equation for maximum power delivered. (5)

3 What is parallel resonance? Derive expression for resonant frequency of the parallel RLC circuit. (5)

4 Explain the different power stages of DC motor. (5)

5 Derive the EMF equation of transformer. (5)

6 Explain how rotating magnetic field is produced in three phase induction motor. (5)

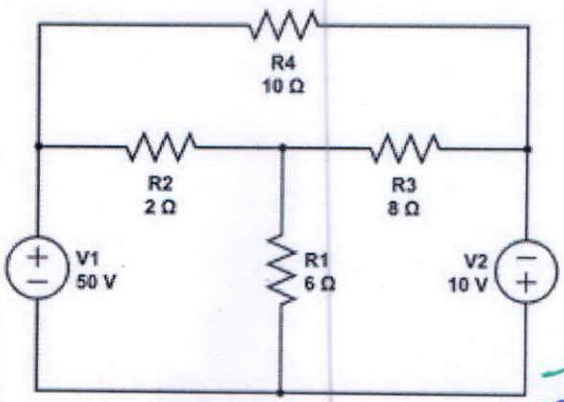
7 Explain the construction of universal motor. (5)

8 Explain the working principle of single phase induction motor. (5)

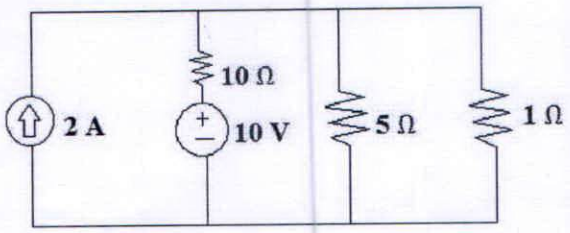
PART B

Answer any threefull questions, each carries 10 marks

9 Find the power loss in 10Ω resistor in the network shown below using mesh analysis. (10)



10 Find the power loss in 1 Ω resistor by Thevenin's Theorem. (10)



11 a) Define bandwidth and Q factor of series resonating circuit. (5)

b) Draw and explain OCC of a separately excited DC generator. (5)

12 a) Explain the necessity of starter. (3)

b) With neat sketch, explain 3 point starter. (7)

13 a) Three coils each having an impedance of (8+6j)Ω are connected in (1) star and (2) delta across 400V, 3 phase line. Calculate the line current and total power for each case. (10)

PART C

Answer any two full questions, each carries 15 marks

14 a) Derive the equation for torque of 3 phase induction motor. (5)

b) An ideal 25kVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50Hz supply. Calculate: (10)

i) Primary and secondary currents on full load

ii) Secondary EMF

iii) Maximum core flux.

15 Explain any 5 types of starting methods of 3 phase induction motor. (15)

16 Explain different types of single phase induction motor. (15)

17 Explain stepper motor and its applications. (15)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EE209

Course Name: ELECTRICAL TECHNOLOGY (MC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries5 marks. Marks

1 Explain in detail about delta to star conversion. (5)

2 Define super position theorem and write its steps to solve the problems. (5)

3 Define resonant circuit. Derive the expression for find resonance frequency of RLC series circuit. (5)

4 Derive EMF equation of DC Generator. (5)

5 Explain in shortly about transformer losses. (5)

6 Sketch and explain Torque-Slip characteristics of 3 phase induction motor. (5)

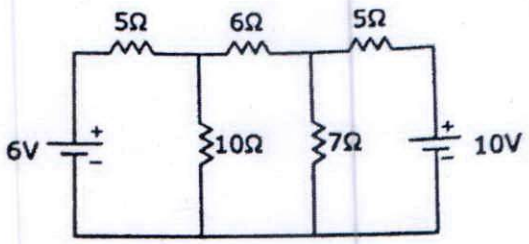
7 Explain shortly about stepper motor and its types. (5)

8 Write the types of single phase induction motors and its applications (5)

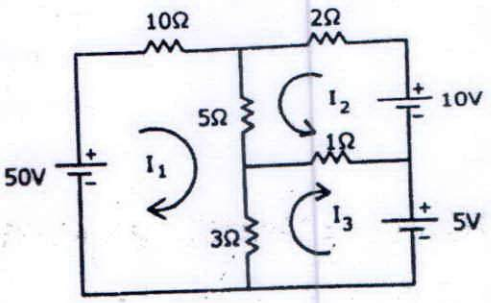
PART B

Answer any three full questions, each carries 10 marks.

9 Find the node voltage V1 and V2 using nodal analysis for the given circuit. (10)



10 Find I_3 through mesh analysis for the following figure. (10)



11 State maximum power transfer theorem. Obtain the condition for maximum power transfer. (10)

12 Explain in detail about three phase power measurement using wattmeter with neat diagram. (10)

13 Derive the torque equation of DC motor. (10)

PART C

Answer any two full questions, each carries 15 marks.

14 What are the necessities of starter? Explain with sketchany three starting method of three phase induction motor. (15)

15 Derive the torque equation, condition for maximum running torque, starting and full load torque of three phase induction motor (15)

16 Explain principle, construction and working of single phase induction motor with its neat sketch. (15)

17 Explain the working concept of synchronous motor with its advantages, disadvantages and applications. (15)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: EE209

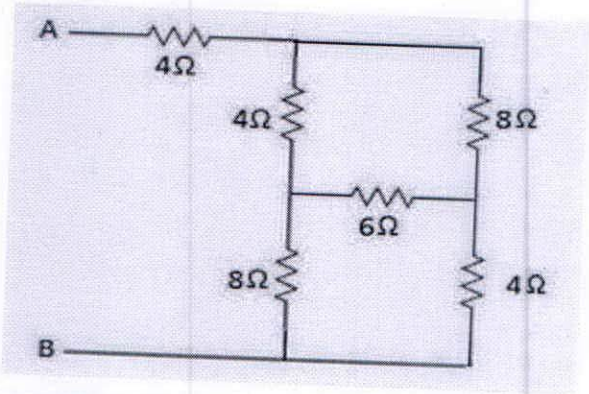
Course Name: ELECTRICAL TECHNOLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries5 marks. Marks

1 Find the equivalent resistance across the terminal A and B using star delta conversion method. (5)



2 State Thevenin's theorem. Mention the steps for solving Thevenin's theorem. (5)

3 Derive relation between phase voltage and line voltage in a star connected system. (5)

4 Explain the different power stages of DC motor. (5)

5 Narrate the properties of ideal transformer. Sketch its phasor diagram (5)

6 Explain the construction of transformer. (5)

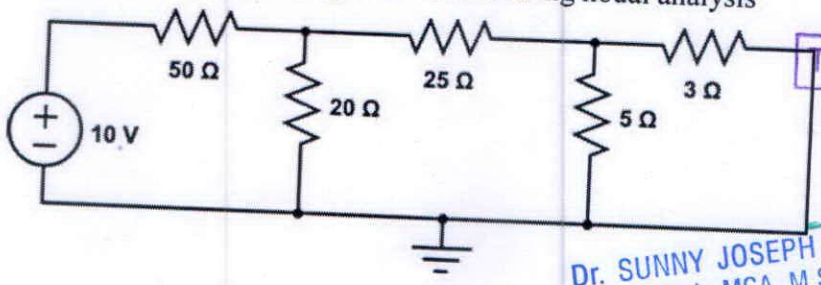
7 Give some applications of synchronous motor. (5)

8 Explain the working principle of single phase induction motor. (5)

PART B

Answer any threefull questions, each carries10 marks.

9 Find node voltages of the given network using nodal analysis (10)



10		State maximum power transfer theorem. Obtain the condition for maximum power transfer.	(10)
11	a)	Compare parallel and series resonance.	(5)
	b)	Draw and explain OCC of a separately excited DC generator.	(5)
12	a)	Explain the necessity of starter.	(3)
	b)	With neat sketch, explain 3 point starter.	(7)
13		How can 3 phase power measurement be done by two wattmeter method?	(10)

PART C

Answer any twofull questions, each carries 15 marks.

14	a)	Derive the equation for torque of 3 phase induction motor.	(5)
	b)	An ideal 25kVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50Hz supply. Calculate i) primary and secondary currents on full load ii) secondary EMF iii) maximum core flux.	(10)
15		Explain various starting methods of a three phase induction motor.	(15)
16	a)	Explain the working principle of servo motor and mention some of its applications.	(7)
	b)	Explain stepper motor and its some applications	(8)
17	a)	Why single phase induction motor is not self-starting? Explain different types of single phase induction motor.	(15)

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