Reg.No.: | | | | | | | | | | | |

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 8004

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2023
Third Semester
Power Systems Engineering
P19PSOE2– INDUSTRIAL SAFETY
(Common to VLSI Design)
(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Write any two preventive steps to avoid the mechanical and electrical hazards.	2	K1	CO1
2.	Infer the safety color codes that should be followed in industries.	2	K2	CO1
3.	Identify any four safety tools used for electrical maintenance.	2	K3	CO2
4.	List the types of maintenance towards industrial safety.	2	K1	CO2
5.	What are the causes of wear and corrosion?	2	K1	CO3
6.	Infer the types of wear and write any two effects.	2	K2	CO3
7.	Interpret the causes the faults in machine tools.	2	K2	CO4
8.	Identify the importance of fault tracing.	2	K3	CO4
9.	Analyze the common troubles due to poor maintenance of an electric motor in an industry.	2	K4	CO5
10.	Infer the concept of repair recycles.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q. No.	Questions	Marks	KL	CO
11. a)	Analyze the causes and effects of electrical and mechanical accidents.	13	K4	CO1

(OR)

1

b)	i.	Infer the salient points in the factories of act 1948 for drinking water layout and lighting.	6	K2	CO1
	ii.	Explain the working of any one firefighting equipment.	7	K2	CO1
12. a)	i.	Explain about replacement economy and how is it related to maintenance cost?	6	K2	CO2
	ii.	Interpret the primary and secondary responsibilities of maintenance department.	7	K2	CO2

(OR)

b)	Compare any four types of maintenance by analyzing the selection criteria, procedure, cost analysis and tools requirements.	13	K4	CO2

13. a)	i.	Explain about any two wear reduction methods with merits and demerits.	6	K2	CO3
	ii.	Analyze the significance and benefits of splash lubrication and gravity lubrication methods.	7	K4	CO3

(OR)

b)	Identify the causes of corrosion. Categorize the same and explain about the corrosion prevention methods.	13	K3	CO3

14. a)	i.	Identify the need of the decision tree in fault tracing.	6	K3	CO4
	ii.	Analyzes the causes of the faults occurred in machine tools.	7	K2	CO4

(OR)

b)	i.	Explain about the sequence of fault finding activities.	7	K2	CO4
	ii.	Identify the problems occurred in hydraulic and pneumatic systems.	6	K2	CO4

15. a)	i.	How is the preventive maintenance useful to increase the life of the industrial equipment?	6	K2	CO5
	ii.	Explain the procedure of periodic maintenance of pumps.	7	K2	CO5

(OR)

b)	i.	Explain about degreasing and overhauling of mechanical components.	7	K2	CO5
	ii.	Infer the preventive maintenance procedure for air compressors.	6	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Develop the decision tree for the problems identified in pump, air compressors and internal combustion engine.	15	K5	CO4

(OR)

b)	i.	Analyze the causes in electric motor operating with less efficiency and explain the remedial measures for the same.	8	K4	CO5
	ii.	Develop a schedule of preventive maintenance to be applied for any two mechanical equipment used in industries.	7	K5	CO5

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Question Paper Code: 8002

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2023
Third Semester
Power Systems Engineering
P19PSOE2 – INDUSTRIAL SAFETY
(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks
Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What do you mean by industrial safety? Write the parameters to be considered under industrial safety.	2	K1	CO1
2.	Infer the types of accidents in industries.	2	K2	CO1
3.	Identify any three types of maintenance used in industries.	2	K3	CO2
4.	Write the definition of repair and maintenance.	2	K1	CO2
5.	How the impact of corrosion is identified?	2	K1	CO3
6.	Identify the wear related failures in industries.	2	K3	CO3
7.	Interpret the need of fault tracing for the industry equipment.	2	K2	CO4
8.	Illustrate any four symbols to make the fault tree.	2	K2	CO4
9.	State the need of maintenance planning and scheduling.	2	K2	CO5
10.	What is meant by the term "maintainability"?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q. No.	Questions	Marks	KL	CO
11. a)	Analyze the consequences of industrial accidents on workers, and the preventive measures against the accidents. Discuss any one case study to support your answer.	13	K4	CO1

(OR)

b)	i.	Infer the safety colour codes used in industries to ensure the safety in the industrial working environment.	6	K2	CO1
	ii.	Identify the need of factory act 1948 and explain about the hazards associated with pressure vessels and the safety measures in industrial processes.	7	K3	CO1
12. a)		Identify the types of tools commonly used in maintenance activities. Explain their applications in maintaining equipment and machinery with suitable examples.	13	K3	CO2

(OR)

b)	i.	Compare the primary and secondary responsibilities of maintenance engineer in a maintenance department.	7	K4	CO2
	ii.	Explain the concept of the service life of equipment and the factors that influence the service life of machinery.	6	K2	CO2
13. a)		Explain about various methods for reducing wear in mechanical components with practical examples. Write the merits and demerits.	13	K2	CO3

(OR)

b)	i.	Identify the causes and effects of wear in industrial equipment.	7	K3	CO3
	ii.	Explain about the factors affecting the corrosion.	6	K2	CO3
14. a)	i.	Explain the decision tree concept in the context of fault tracing. How does it help in systematically identifying and solving problems?	6	K2	CO4
	ii.	Identify the general causes for getting faults. Discuss how these causes can lead to the problems in machine tools.	7	K3	CO4

(OR)

b)		Analyze the faults and their causes in thermal and electrical equipment.	13	K4	CO4
15. a)	i.	Infer the key factors that necessitate regular and scheduled inspections in industrial settings.	6	K2	CO5
	ii.	Describe the steps involved in the overhauling process for mechanical components and machinery.	7	K2	CO5

(OR)

b)		Explain the steps and procedures required for preventive maintenance of diesel generating sets and air compressors, focusing on ensuring their reliability and efficiency.	13	K2	CO5

PART – C

Q.No.	Questions	Marks	KL	CO
16. a)	Develop the strategies for preventing corrosion by applying different methods in different industrial settings. Compare the effectiveness of coatings, inhibitors, and cathodic protection methods with suitable examples.	15	K5	CO3

(OR)

		Marks	KL	CO
b) i.	Create a decision tree diagram to illustrate the step-by-step process of fault finding for a specific type of equipment. Select any equipment by your own.	8	K6	CO4
		7	K5	CO5
ii.	Determine repair complexities in the context of maintenance and suggest a repair cycle for any one industrial equipment.			

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Question Paper Code: 7001

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2023
Third Semester
VLSI Design
P19VDE19 – COMMUNICATION NETWORKS
(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Outline the goals of fast Ethernet.	2	K2	CO1
2.	Show that SONET is a synchronous network.	2	K2	CO1
3.	Recall the principle of congestion control efficiency and fairness.	2	K1	CO2
4.	List the advantages and disadvantages of generalized processor sharing algorithm.	2	K1	CO2
5.	Sketch the frame formats of the Border Gateway Protocol messages.	2	K2	CO3
6.	What is random early detection?	2	K1	CO3
7.	Define traffic profiles.	2	K1	CO4
8.	Compare integrated services with differentiated services.	2	K2	CO4
9.	Outline the benefits of Multi-Protocol Label Switching (MPLS).	2	K2	CO5
10.	What is multi-homing?	2	K1	CO5

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Interpret the significance of separating the LAN by bridges.	6	K2	CO1
		ii.	An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. Can the date be encapsulated in one frame? If not, how many frames need to be sent? Find and infer the size of the data in each frame.	7		
			(OR)			
	b)		Summarize the various connecting devices involved in backbone networks.	13	K2	CO1
12.	a)		Compare and contrast traffic specific LBAP and leak-Bucket algorithms for reliable multicasting networks.	13	K2	CO2
			(OR)			
	b)		With suitable pseudocodes, explain in detail about the Deficit Round Robin scheduling algorithm and summarize its performance.	13	K2	CO2
13.	a)		Outline the requirements of multicast routing and examine the three approaches employed by internet routing protocols to gather and use routing information.	13	K4	CO3
			(OR)			
	b)		Analyze and explain the Open Shortest Path First (OSPF) Protocol which is used as the interior router protocol in TCP/IP networks.	13	K4	CO3
14.	a)		Explain in detail about the various congestion control mechanisms for TCP/IP protocols.	13	K2	CO4
			(OR)			
	b)		An output interface in a switch is designed using the leaky bucket algorithm to send 8000 bytes/s (tick). If the following frames are received in sequence, show the frames that are sent during each second. Frames 1, 2, 3, 4 : 4000 bytes each Frames 5, 6, 7 : 3200 bytes each Frames 8, 9 : 400 bytes each Frames 10, 11, 12 : 2000 bytes each	13	K2	CO4
15.	a)		Outline the significance of end-to-end packet delay dynamics of the Internet and elaborate an approach for modeling it.	13	K2	CO5
			(OR)			
	b)		Interpret the main features of IPv6 which can help to deal with scaling problems caused by the Internet's massive growth.	13	K2	CO5

PART – C

Q.No.	Questions	Marks	KL	CO
16. a)	Create a system of three LANs with four bridges. The bridges (B1 to B4) connect the LANs as follows: a. B1 connects LAN 1 and LAN 2 b. B2 connects LAN 1 and LAN 3 c. B3 connects LAN 2 and LAN 3 d. B4 connects LAN 1, LAN 2 and LAN 3 Choose B1 as the root bridge. Interpret the forwarding and blocking ports, after applying the spanning tree procedure.	15	K5	CO1

(OR)

Q.No.	Questions	Marks	KL	CO
b)	Compare and contrast the following network simulation tools based on their characteristic features. 1. NS2 2. OPNET 3. QualNet	15	K5	CO4

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Question Paper Code: 7006

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2023
Third Semester
VLSI Design
P19VDE24 - WIRELESS ADHOC AND SENSOR NETWORKS
(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What is meant by Basic Service Set and Extended Service Set (ESS)?	2	K1	CO1
2.	How to overcome the exposed terminal problem in wireless Networks?	2	K3	CO1
3.	List the important features of DSDV.	2	K2	CO2
4.	Define Proactive Routing Protocol with example.	2	K2	CO2
5.	Outline the differences between a node (station) in Ad hoc networks and sensor networks.	2	K2	CO3
6.	What is meant by flow control in networks?	2	K1	CO3
7.	Recall the importance of Sensor Network programming.	2	K1	CO4
8.	Outline the role of time synchronization in sensor management.	2	K2	CO4
9.	Define TESLA.	2	K1	CO5
10.	Recall the necessity of Biba.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q. No.	Questions	Marks	KL	CO
11. a)	Compare and contrast Mobile TCP and Indirect TCP in Wireless Networks.	13	K2	CO1
	(OR)			
b)	Explain the MAC layer frame format for the IEEE 802.11 WLAN.	13	K2	CO1

1

| 12. | a) | Summarize Hybrid routing approach in ad hoc networks, Also explain about any one of the Hybrid routing protocols with an example. Mention its advantages and disadvantages. | 13 | K2 | CO2 |

(OR)

| | b) | Summarize the need for DREAM. Explain the principle of Power – Aware Routing in MANETs. | 13 | K2 | CO2 |

| 13. | a) | i. | With a neat diagram, illustrate the architecture of ZigBee protocol stack and outline its functionalities of each layer. | 9 | K3 | CO3 |
| | | ii. | Interpret the frame format of IEEE 802.15.4 protocol standard. | 4 | K2 | |

(OR)

| | b) | Summarize the Error Control Mechanisms used in Wireless Networks. Compare and contrast Data Centric & Contention Based Networking. | 13 | K2 | CO3 |

| 14. | a) | Explain the localization and its significance in WSNs. Explain the triangulation method for localization in WSNs with example. | 13 | K2 | CO4 |

(OR)

	b)	Explain the following		K2	CO4
		i. Sensing Mode Selection Protocols.	7		
		ii. Sensor Network Simulators.	6		

| 15. | a) | Summarize the Defense against routing attacks. Also justify the statement, "SPINS achieve broadcast security in wireless sensor networks" | 13 | K2 | CO5 |

(OR)

| | b) | Explain Software based Anti-tamper techniques and water marking techniques to improve the network security in Ad Hoc and Sensor networks. | 13 | K2 | CO5 |

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Consider IEEE 802.11 based Vehicular Ad-hoc Networks where vehicles are nodes and connected with RSU (Road Side Unit, which is a Wi-Fi access point). When we use IEEE 802.11 for such a high mobility vehicular networks, infer the possible challenges in terms of connectivity and routing? Suggest the possible solutions.	15	K6	CO3

(OR)

| b) | With a neat block diagram, discuss the hardware architecture of a WSN which can be used for any application (you can assume any application) to collect the sensor data. Infer the various sensors you will use? How does the sensor data can be accessed through a mobile application? Outline the communication protocols that can be used. | 15 | K6 | CO4 |

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Question Paper Code: 8001

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2023
Third Semester
Power Systems Engineering
P19PSE30 – SMART GRID TECHNOLOGY AND APPLICATIONS
(Regulation 2019)

Time : Three Hours   Maximum : 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List the drivers of smart electric grids.	2	K1	CO1
2.	Interpret the smart grid roadmap for India.	2	K2	CO1
3.	Relate the major elements to develop generic phasor measurement unit (PMU).	2	K2	CO2
4.	Infer the available communication media for WAMS in the smart electric grid.	2	K2	CO2
5.	Outline the role of super capacitor in microgrids.	2	K2	CO3
6.	Illustrate the PV and IV curves of a typical solar panel.	2	K1	CO3
7.	Summarize the merits of crossover and mutation operators.	2	K2	CO4
8.	What are global and local minima during optimization?	2	K1	CO4
9.	Identity the application offered by PaaS.	2	K3	CO5
10.	Write the significance of cloud computing in smart grid.	2	K1	CO5

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Define smart electric grid as per IEEE standard and infer the characteristics of smart grid.	6	K2	CO1
		ii.	Explain the major smart grid initiatives under taken in India by the Government and other organizations.	7		
			(OR)			
	b)	i.	Explain the electrical, information and communication technologies required to build a smart grid.	10	K2	CO1
		ii.	Interpret key challenges noticed in the development of smart electric grid.	3		
12.	a)	i.	Explain the general architecture of a typical wide area monitoring, protection and control (WAMPAC) system for smart electric grid.	5	K2	CO2
		ii.	Explore the functional operation of phasor measurement unit (PMU) with necessary diagrams.	8		
			(OR)			
	b)		Illustrate the IoT architecture to be used in smart grid and explain its operation.	13	K2	CO2
13.	a)	i.	Let a river flow with low velocity abundant water. Design a micro hydro plant to supply electricity to the remotely located house with neat a sketch and functions.	10	K3	CO3
		ii.	Calculate the active power in a 315 F capacitor which is utilized for energy storage.	3		
			(OR)			
	b)		Identify the functions of plug-in-electric-vehicle in the power grid system and explain the same.	13	K3	CO3
14.	a)		Analyze the strategy to forecast the electric power consumption by utilizing neural artificial intelligence.	13	K4	CO4
			(OR)			
	b)		Develop a solution for optimal placement of solar power plants by the applying particle swarm optimization tool.	13	K4	CO4
15.	a)	i.	Define cloud computing process and develop the cloud computing architecture with an example.	7	K3	CO5
		ii.	Identify the characteristics of cloud computing that can yield improved smart electric grid applications.	6		
			(OR)			

b)	i.	Interpret the objectives of cyber security in view of the smart electric grid.	5	K2	CO5
	ii.	Identify the risks to be assessed by smart grid cyber security coordination task group.	8	K3	

PART – C

Q.No.		Questions	Marks	KL	CO
16.	a)	Illustrate the operation of 21st century substation for monitoring and protection of power grid by utilizing advanced metering infrastructure. Highlight the benefits achieved through modern automated electric substation.	15	K2	CO2
		(OR)			
	b)	Develop an appropriate big data analytic platform to process the bulk amount of synchrophasor information received at phasor data concentrator (PDC) from various large number of phasor measurement units (PMUs) by utilizing could computing tool.	15	K3	CO5

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