

QUESTION BANK

Subject: EET402 Electrical System Design & Estimation S8 EEE

MODULE 1			
Sl.No	Question	Marks	Year
1	Mention the Scope of Indian electricity act 2003 in brief	5	KTU DEC 2018
2	What are the steps to be followed for safety precautions against electric shock?	4	KTU DEC 2018
3	Describe electric service in buildings.	6	KTU DEC 2018
4	Explain the scope of the following IS codes: IS 732, IS 3043 OR What are the importance of IS 3043, IS 732?	5	KTU DEC 2020
5	Explain the salient features of electricity act 2003 OR Discuss the aims of Indian Electricity Act 2003.	5	KTU DEC 2020
6	Explain the significance of IS codes in electrical system design? How can we design a proper earthing system using IS codes for various electrical systems?	5	KTU DEC 2021
7	Explain the significance of NEC 2011 in Indian power sector. OR What is NEC? Explain its relevance in electrical installations.	5	KTU DEC 2021
8	Write the classification of voltages according to the applications	5	KTU DEC 2021
MODULE 2			
Sl.No	Question	Marks	Year
1	A certain incandescent lamp, hangs from the ceiling of a room. The illuminance received on a small horizontal screen lying on a bench 2m vertically below the lamp is 63.5 lux. Calculate illuminance at a point when the screen is moved horizontally a distance of 1.5m along the bench.	5	KTU DEC 2018
2	Mention the various types of luminaries used for proper lighting scheme.	5	KTU DEC 2018
3	An office 30m X 15m is illuminated by twin 40w fluorescent luminaries of lumen output 5600 lumens. The lamps being mounted at a height of 3m from the work plane, the average	5	KTU DEC 2018

	illumination required is 240lux. Calculate the number of lamps required to be fitted in the office, assuming the CU 0.6 and maintenance factor to be 0.8. Assume the height of ceiling as 4.5m		
4	Explain the various design parameters taken into consideration while designing street lighting and flood lighting.	5	KTU DEC 2018
5	What are the factors to be considered while selecting the type of wiring?	5	KTU DEC 2020
6	What is the purpose of A lamp giving out 1200 lm in all directions is suspended 8 m above the working plane. Calculate the illumination at a point on the working plane 6 m away from the foot of the lamp	5	KTU DEC 2020
7	Which are the energy conservation techniques in lighting	5	KTU DEC 2020
8	A single storied residential building with two bedrooms with attached toilets, one dining room, one living room, kitchen, and sit out. Decide the required number of light points, fan points, 5A socket outlet, 15A socket outlet. Decide the number of sub circuits required. Determine the connected load, type of supply required, sub circuits required, maximum demand	10	KTU DEC 2020
9	What are the laws of illumination? Explain with a neat diagram OR Explain the laws of illumination with a neat diagram.	10	KTU DEC 2020
10	Explain the factors to be considered for an efficient lighting system design.	5	KTU DEC 2021
11	Mention the features of good lighting scheme for buildings?	5	KTU DEC 2019
12	What are the requirements of efficient street lighting?	5	KTU DEC 2020
13	Explain Coefficient of utilisation and LLF in illumination systems. Explain in detail the factors affecting LLF?	6	KTU DEC 2021
14	State the importance of LLF and CU in lighting design. An illumination of 300 lux is to be produced on the floor of a room 12m x 9m. 10W LED lamps of 1000lumens are used for the installation. Considering CU and LLF as 0.7, calculate the number of lamps required for the installation.	6	KTU DEC 2021
15	In a residential building, having 45 nos of light points , 10 fan points, 20 nos of 5 ampere plug socket, 6 nos of 15 ampere power plug socket and 1.5 HP single phase motor pump set (assume DOL starting). Calculate the total connected load, the no. of sub-circuits required, and select the conductors used for each sub-circuits.	10	KTU DEC 2019

MODULE 3			
Sl.No	Question	Marks	Year
1	Specify a circuit breaker having both short circuit and overload protection. Explain its difference between MCB and ELCB.	5	KTU DEC 2018
2	Design an electrical schematic for the residential building with following details. Locate the positions of meter board, Main Switch board, DB, switch boards. <div style="text-align: center;"> </div>	5	KTU DEC 2018
3	Which are the main factors to be taken into account for the selection of cables? Explain.	5	KTU DEC 2020
4	What are the safety aspects that have to be considered while doing electrical dwelling in LV and MV installations?	5	KTU DEC 2019
5	Explain design requirements of high rise buildings.	5	KTU DEC 2019
6	Describe the selection procedure for ELCB for domestic and industrial dwelling	6	KTU DEC 2018
7	What are functions of RCCB? How does RCCB protect the electrical installation under fault conditions?	3	KTU DEC 2021
MODULE 4			
Sl.No	Question	Marks	Year
1	Explain different methods of cooling of a transformer.	10	KTU DEC 2018
2	Draw the single line diagram of a transformer substation of 400 kVA, 11 kV/ 415 V, dry type transformer. Specify the rating of each unit at the primary and secondary side of the transformer with proper justification	10	KTU DEC 2018
3	Define the function of AMF panel in electrical supply system	5	KTU DEC 2018
4	How do you design an earth mat in substation? Explain its importance.	5	KTU DEC 2018

5	Explain rising mains and rising buses in high rise buildings.	5	KTU DEC 2018
6	Explain with suitable line diagram, how standby generators can include in existing electrical supply system. Assume HT consumer connection.	8	KTU DEC 2018
7	An outdoor pole mounted 11kV/433 V substation has to be installed for supply to a residential area having a load of 63 kVA. With the help of a neat diagram, make a list of materials required.	10	KTU DEC 2020
8	Explain the substation earthing system	5	KTU DEC 2020
9	Write short note on the substation earthing system.	5	KTU DEC 2021
10	A substation has to be installed in a residential complex having a load of 50kVA, taking supply from a nearby 11kV line. Which type of substation must be chosen for this application? List out the materials required for the installation of this substation.	10	KTU DEC 2021
11	The following motors have to be installed in a plastic manufacturing industry i. 5.5hp, three phase motor (M1) ii. 3hp, three phase motor (M2) iii. 1.5hp, single phase motor (M3) iv. ¼ hp, single phase motor (M4) The positions of the machines are given below. Select the suitable components for the motor wiring system and draw the wiring circuit diagram with required components. Any missing data may be assumed	10	KTU DEC 2021
12	What are the factors to be considered while selecting a standby generator?	5	KTU DEC 2019
13	What are the advantages and disadvantages of an outdoor type substation over an indoor type substation?	10	KTU DEC 2019
14	What are the classifications of the substations according to its functions?	5	KTU DEC 2019
15	Draw the single line diagram of pole mounted outdoor substation of 11kV/415V, 250kVA transformer showing all necessary parts based on loading. OR Draw the single line diagram of an indoor substation showing all accessories of the system. OR Draw the single line diagram of a 500kVA, 11kV/415V indoor substation and justify the component ratings	7	KTU DEC 2019

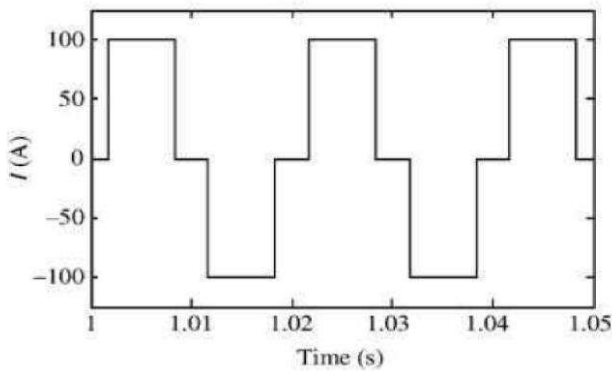
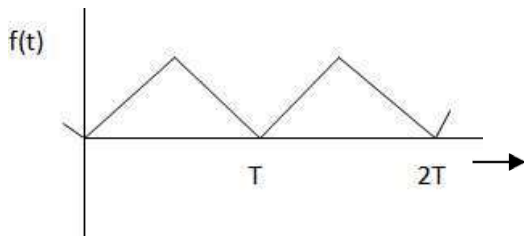
MODULE 5			
Sl.No	Question	Marks	Year
1	What are the factors which decide the power distribution architecture in an electrical installation of an industry	5	KTU DEC 2018
2	What are the various energy conservation techniques imposed in buildings?	5	KTU DEC 2018
3	What is automatic transfer switch? Explain.	5	KTU DEC 2020
4	Explain with the help of schematic, the necessary protections to be provided for a 100 kVA standby diesel generator installed in an electrical installation.	8	KTU DEC 2020
5	What are the design considerations of solar PV system for domestic applications?	10	KTU DEC 2020
6	Briefly explain need of a solar PV system for domestic application.	5	KTU DEC 2019
7	What are different types of PV system designs used in electrical systems for renewable energy integration?	5	KTU DEC 2021

QUESTION BANK

EET436: POWER QUALITY

Sl No:	Questions	Marks	Year
Module - 1			
1.	‘Power Quality is voltage quality’. Comment.	3	Model Question Paper
	Define power quality. Why power quality has become an issue in recent years	5	December 2018 (2015 Scheme)
2.	Differentiate between impulsive and oscillatory transients.	3	Model Question Paper
		5	December 2019 (2015 Scheme)
3.	Explain the sources of voltage sag in a power network.	6	Model Question Paper
	What is meant by voltage sag and voltage swell as per IEEE standard.	5	December 2018 (2015 Scheme)
4.	Explain voltage unbalance and voltage flicker	5	May 2019 (2015 Scheme)
5.	Differentiate between harmonics and interharmonics	5	May 2019 (2015 Scheme)
6.	Discuss any four effects of power quality problems.	8	Model Question Paper
7.	What is meant by waveform distortions? Using neat diagrams, explain the five primary types of waveform distortion.	14	Model Question Paper
	What are the disturbances coming under the term “waveform distortion”? Explain each one them with neat figures	10	December 2018 (2015 Scheme)
		10	December 2019 (2015 Scheme)
8.	Differentiate between linear loads and non-linear loads with suitable examples.	5	December 2018 (2015 Scheme)
9.	Illustrate about notching in power quality	5	May 2019 (2015 Scheme)

Module - 2

10.	What do you mean by triplen harmonics and what are its effects in the power system?	3	Model Question Paper
11.	Explain the generation of harmonics in the presence of non-linear loads.	3	Model Question Paper
12.	Explain the mechanism of harmonic generation.	5	May 2019 (2015 Scheme)
13.	Explain the effects of power system harmonics on different components of power systems.	14	Model Question Paper
14.	<p>For a quasi-square wave of (120° pulse width) of current with an amplitude I of 100A (shown in Fig), calculate (a) crest factor (CF), (b) distortion factor (DF), and (c) total harmonic distortion.</p> 	14	Model Question Paper
15.	Explain how Fourier series can be used for harmonic analysis.	5	December 2018 (2015 Scheme)
	<p>Find the amplitude of the 5th harmonic of given waveform. Peak value is unity.</p> 	5	December 2018 (2015 Scheme)
	Obtain the Fourier series expansion of given function	10	May 2019 (2015 Scheme)

	<p>Obtain the Fourier series expression for the waveform shown below. Peak value of the waveform is unity.</p>	10	December 2019 (2015 Scheme)
16.	Calculate the total harmonic distortion of a voltage waveform with following harmonic frequency makeup: Fundamental $V_1=114V$, $V_3=4V$, $V_5=2V$, $V_7=1.5V$, $V_9=1V$	5	December 2019 (2015 Scheme)
17.	Find the harmonic distortion of a voltage with following harmonic components: Fundamental= $114V$, 3 rd harmonic= $4V$, 5 th harmonic= $27V$, 7 th harmonic= $1.5V$, 9 th harmonic= $1V$	5	December 2018 (2015 Scheme)
	Find the total harmonic distortion of the waveform having magnitude of fundamental component unity and 3 rd , 5 th , 7 th and 9 th harmonics, reciprocal of harmonic number.	5	May 2019 (2015 Scheme)
Module - 3			
18.	Write short note on IEEE 519 standard.	3	Model Question Paper
	What is the need of power quality standards? Mention the various IEEE standards for power quality	10	May 2019 (2015 Scheme)
19.	Discuss the objectives of power quality monitoring.	3	Model Question Paper
		5	December 2018 (2015 Scheme)
		5	December 2019 (2015 Scheme)
		5	May 2019 (2015 Scheme)

	Explain the importance of power quality monitoring.	5	December 2018 (2015 Scheme)
20.	Define total harmonic distortion, distortion factor, total demand distortion and telephone influence factor.	8	Model Question Paper
	Explain in detail how the following indices can be used to measure harmonic distortion in power system: a)THD b)TDD c)TIF d)DIN e) C message weights	10	December 2018 (2015 Scheme)
		5	May 2019 (2015 Scheme)
21.	Derive the relationship between total power factor, distortion factor and displacement factor.	6	Model Question Paper
22.	How is RMS value computed by a power quality monitoring instrument?	7	Model Question Paper
23.	Describe the functionalities offered by a power quality analyzer.	7	Model Question Paper
	Explain the features for power line disturbance analyzer	5	December 2018 (2015 Scheme)
24.	With the help of block diagram, explain in detail about the flickermeter.	7	December 2018 (2015 Scheme)
		6	May 2019 (2015 Scheme)
Module - 4			
25.	List the merits and demerits of passive filters to reduce harmonic distortion.	3	Model Question Paper
	With neat diagram, explain shunt passive filters.	5	December 2018 (2015 Scheme)
	Distinguish between active filter and passive filter	5	December 2018 (2015 Scheme)
	Explain the role of filters in power quality?	3	December 2018 (2015 Scheme)
	With neat diagram, explain the operation of series active filter to improve power quality.	7	December 2018 (2015 Scheme)
	With neat diagram, explain shunt active filters	5	May 2019 (2015 Scheme)
	Explain hybrid filters	5	May 2019

			(2015 Scheme)
	Explain the procedure for designing the harmonic filter	10	May 2019 (2015 Scheme)
	Differentiate between active and passive filters used for harmonic elimination.	5	December 2019 (2015 Scheme)
26.	Define Telephone Interference Factor.	3	Model Question Paper
27.	Explain the working principle of DVR for sag and swell correction.	6	Model Question Paper
28.	A single-phase fully controlled bridge converter is fed from a supply of 230V at 50 at a thyristor firing angle of 60° . Consider continuous load current of 200 A. Design a shunt passive filter with third, fifth, seventh and a ninth passive tuned filters.	8	Model Question Paper
29.	Draw the configuration of a unified power quality conditioner and show that it offers a single solution for mitigating multiple power quality problems.	14	Model Question Paper
Module - 5			
30.	Explain the operation of a PWM power factor correction circuit. Using a block diagram, explain the control logic of the same.	14	Model Question Paper
31.	Discuss the important solutions to wiring and grounding problems.	14	Model Question Paper
32.	What is meant by islanding? List the problems caused by it.	3	Model Question Paper
33.	Explain various power quality conditioners for smart grid.	10	December 2018 (2015 Scheme)
34.	Explain power quality issues of grid connected renewable energy sources.	10	May 2019 (2015 Scheme)
35.	Describe the term Ground Loops. List solutions for mitigating this problem.	3	Model Question Paper

QUESTION BANK (S8EEE)

EET424 ENERGY MANAGEMENT

Module 1

Sl No.	Question	KU/ KTU Year	Marks
1	What is energy audit? Discuss types of energy audit briefly.duties of energy manager.	KTU JUN 2019,2021	10
2	a)Define energy management b)Principles of energy management	KTU JUN 2021, KTU JUN 2019,2021	5
3	Steps involved in energy management planning.	KTU JUN 2016	10
4	Short note on building management system	KTU DEC 2017,2022	7
5	Short note on ECBC code	KTU DEC 2018	5
6	Short note on detailed energy audit	KTU DEC 2016	10
7	Discuss the different instruments used for energy audit.	KTU DEC 2019,2022	7
8	With the help of case studies, explain any four energy management principles.	KTU DEC 2017	7
9	what do you mean by energy audit report.	KTU JUN 2016	8
10	Explain what do you mean by POWER QUALITY audit .	KTU DEC 2019,2022	10

Module 2

Sl No.	Question	KU/ KTU Year	Marks
1	Compare the efficacy of different light sources.	KTU DEC 2016,2020	10
2	a)Write notes on design measures for increasing efficiency in transformers. b) Write about efficiency curve	KTU DEC 2021	5
3	a)With the help of case studies, explain any four methods to reduce energy consumption in lighting b) Write about the comparison of old lightings with modern lightings	KTU DEC 2020,2022	10
4	a)Explain how energy efficient motors help in reducing energy consumption b) Explain about energy efficient motors	KTU DEC 2016,2021	7
5	Define cascade efficiency of an electrical system. How it can be calculated?	KTU DEC 2017,2019	10
6	Explain the different methods used for peak demand control.	KTU DEC 2018	5

Module 3

1	a)Discuss the benefits of demand side management. b) Explain the different techniques of demand side management	KTU DEC 2017,2019	6
2	Explain the benefits of power factor improvement.	KTU DEC 2017,2020	5
3	The load on an installation is 800 kW, 0.8 lagging p.f. which works for 3000hours per annum. The tariff is Rs 100 per kVA plus 20 paise per kWh. If the power factor is improved to 0.9 lagging by means of loss-free capacitors costing Rs 60 per kVAR, calculate the annual saving effected. Allow 10% per annum for interest and depreciation on capacitors.	KTU DEC 2016,2020	5
4	Discuss the importance of peak demand control. Explain the different methods used for that.	KTU DEC 2021	5
5	Explain the different types of ancillary services.	KTU DEC 2020,2022	10
6	Discuss the different energy conservation opportunities in boilers.	KTU DEC 2016,2021	5
7	Explain in detail, the reasons for low furnace efficiency.	KTU JUNE 2020,2022	10
8	What is meant by a steam trap? Explain the operation of the thermostatic steam trap.	KTU DEC 2016	7
9	Explain any four energy conservation opportunities in furnaces.	KTU DEC 2019,2022	5

Module 4

1	Discuss any two opportunities for energy savings in steam distribution.	KTU JUN 2019,2021	10
2	Explain the working of a waste heat recovery system.	KTU JUN 2021, KTU JUN 2019,2021	10
3	Explain the working of different types of cogeneration systems.	KTU JUN 2016	12
4	Explain any five energy saving opportunities in heating, ventilating and air conditioning systems.	KTU DEC 2018	10
5	a)How is cooling capacity of a cooling tower calculated? b)Which type of cooling is better for DG set - 'Air Cooling' or 'Water Cooling'? Why?	KTU DEC 2016	6
6	Is it possible to assess the combustion efficiency of a boiler by flue gas analysis?Explain	KTU DEC 2017	3
7	Write notes on computer aided energy management.	KTU DEC 2016	5
8	Explain any five energy saving opportunities in heating, ventilating and air conditioning systems.	KTU DEC 2019,2022	7

Module 5

1	What are the advantages and disadvantages of the payback period method?	KTU DEC 2017	5
2	Write notes on time of pricing methods	KTU JUN 2016	5
3	a. Calculate the energy saving and payback period which can be achieved by replacing a 11 kW, existing motor with an EEM. The capital investment required for EEM is Rs. 40,000/-. Cost of energy/kWh is Rs. 5. The loading is 70% of the rated value for both motors. Efficiency of the existing motor is 81% and that of EEM is 84.7%	KTU DEC 2016	5
4	Compare internal rate of return method with present value method for the selection of energy projects.	KTU DEC 2019,2022	5
5	Explain how the life cycle costing approach can be used for the selection of energy projects.	KTU DEC 2016,2020	5
6	Define Internal Rate of Return. How it can be found out?	KTU DEC 2018	5
7	A new cogeneration plant installation is expected to reduce the company's annual electricity bill by Rs.4,86,000/-. The capital cost of the new installation is 22,20,000/- and the annual maintenance and operating cost are Rs.42,000/-. Find out the simple pay back period.	KTU DEC 2017	5
8	Discuss the electrical ECO's in a commercial building	KTU JUN 2016	10
9	Briefly explain Life Cycle Costing , What do you mean by time value of money?	KTU DEC 2017,2022	10

10	<p>The cash flow of an energy saving project with a capital investment cost of Rs. 20,000/- is given in the table below. Find the NPV of the project at a discount rate of 10%. Also find the Internal Rate of Return of the project.</p> <table><tr><th>Year</th><th>Cash Flow in Lakhs</th></tr><tr><td>1</td><td>7000</td></tr><tr><td>2</td><td>7000</td></tr><tr><td>3</td><td>7000</td></tr><tr><td>4</td><td>7000</td></tr><tr><td>5</td><td>7000</td></tr><tr><td>6</td><td>7000</td></tr></table>	Year	Cash Flow in Lakhs	1	7000	2	7000	3	7000	4	7000	5	7000	6	7000	KTU DEC 2016,2020	10
Year	Cash Flow in Lakhs																
1	7000																
2	7000																
3	7000																
4	7000																
5	7000																
6	7000																
11	<p>Prepare an energy audit report conducted in a domestic system. The building is installed with rooftop PV system and the owner is having a four wheeler also.</p>	KTU DEC 2018	10														

		KTU DEC 2016,2020	10														
	<table><tr><th>Year</th><th>Cash Flow in Lakhs</th></tr><tr><td>1</td><td>3.2</td></tr><tr><td>2</td><td>3.5</td></tr><tr><td>3</td><td>4.3</td></tr><tr><td>4</td><td>3.8</td></tr><tr><td>5</td><td>4.5</td></tr><tr><td>6</td><td>5</td></tr></table> <p>Calculate the NPV of the investment, if the interest rate is 12% and capital investment is Rs. 25 Lakhs and comment on the feasibility of the project. The return from the project is as follows:</p>	Year	Cash Flow in Lakhs	1	3.2	2	3.5	3	4.3	4	3.8	5	4.5	6	5		
Year	Cash Flow in Lakhs																
1	3.2																
2	3.5																
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4	3.8																
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6	5																

QUESTION BANK

EET468 INDUSTRIAL INSTRUMENTATION AND AUTOMATION (S8 EEE)

Module 1				
Sl No.	Questions	Marks	KU/KTU	Instructional Objectives
			(Month/Year)	
1	Define Transducer. List the different criteria for classification of it.	5		
2	Define the following. 1. Resolution 2. Precision 3. Accuracy 4. Threshold 5. Linearity 6. Hysteresis 7. Repeatability	7		
3	What do you understand about the dynamic characteristics of a transducer? Define Speed of response, Fidelity, Lag, Dynamic Error.	8		
4	What do you understand about static characteristics? List the different types of static characteristics. Define the terms: Instrument, accuracy, precision, Resolution, sensitivity and errors.	8		
5	Draw and explain second order sensor time response	4	KTU May, October 2019	
6	Draw the block diagram representation of a process control system and explain the functions of each block.	5	KTU May, October 2019	
7	Draw the step response of a first order sensor. Explain the effect of time constant on the nature of response of the sensor	5	KTU October 2019	
8	A sensor measures temperature linearly with a static transfer function of $33\text{mV}/^{\circ}\text{C}$ and has a 1.5-s time constant. Find the output 0.75 s after the input changes from 20°C to 41°C . Find the error in temperature this represents.	7		
9	Explain the factors that govern the output characteristics of a transducer.	5	KTU May 2019	
10	Explain the factors influencing the choice of a transducer for an industrial instrumentation system	6	KTU May, October 2019	
11	List any five factors affecting the choice of transducer	4	KTU Sept 2020	
12	Explain the working of variable reluctance tachometer	4	KTU Sept 2020	

13	Explain the measurement of flow using a Hot Wire Anemometer.	5	KTU October 2019	
14	Enlist capacitive transducers. Explain any one in detail.	7		
15	Draw and explain the working of a capacitive differential pressure transducer.	4	KTU May, October 2019	
16	Explain about the analog and digital phase detectors.	10		

Module 2				
Sl No.	Questions	Marks	KU/KTU	Instructional Objectives
			(Month/Year)	
1	Explain the importance of signal conditioning in industrial instrumentation systems.	5	KTU May, October 2019	
2	What is an instrumentation amplifier and discuss its role in instrumentation.	5	KTU October 2019	
3	Explain the working of instrumentation amplifier with basic circuit diagram	4	KTU Sept 2020	
4	Write a short note on precision rectifiers and Isolation amplifiers.	10		
5	How can the noise problem in instrumentation be minimized?	5		
6	Explain different switched capacitor circuits	7		

7	List any five important features of instrumentation amplifiers.	5	KTU May 2019	
8	Explain the principle of operation of phase sensitive detectors.	5	KTU May 2019	
9	Derive an expression for the output voltage of a logarithmic amplifier and show that it is proportional to logarithm of input voltage	5	KTU May 2019	

Module 3				
Sl No.	Questions	Marks	KU/KTU	Instructional Objectives
			(Month/Year)	
1	a)What are the advantages and disadvantages of MEMS? b)With the help of a diagram explain the principle of MEMS accelerometer. c)What is MEMS? List its advantages and applications.	5	KTU May, October 2019	
2	Explain the steps involved in surface micromachining with relevant figures. Compare surface micromachining with bulk micromachining.	10		
3	With the help of a block diagram explain the architecture of virtual instruments.	5	KTU October 2019	
4	Differentiate between bulk and surface micromachining.	5	KTU May 2019	
5	a)Explain the need for virtual instruments with an example and concepts of graphical programming. b)List the advantages of virtual instruments over traditional instruments c)Explain the concept of graphical programming in virtual instruments..	5 10	KTU May, October 2019	

6	Give the classification of control valves.	5	KTU October 2019	
7	What is the role of actuators in an automation system? How are they classified?	5	KTU May 2019	
8	Define an industrial automation system and enlist its components.	5	KTU May, October 2019	
9	Explain the selection criterion for control valves?	5	KTU May 2019	
10	With the help of a neat diagram explaining the working of butterfly valve.	5	KTU May 2019	
11	Explain the working of a solenoid actuator with the help of a diagram.	5	KTU October 2019	

Module 4				
Sl No.	Questions	Marks	KU/KTU	Instructional Objectives
			(Month/Year)	

1	Give the significance of timers and counters in PLC.	5	KTU May, October 2019	
2	With some suitable examples explain four major components of the DCS system.	8		
3	Draw the PLC ladder diagrams to realize two input AND, OR and XOR gates.	5	KTU May, October 2019	
4	What is PLC? What are the advantages of a PLC control system? What are different data files available in PLC?	7		
5	What is the function of I/O module in a PLC? Describe the basic functional blocks of a PLC with suitable diagrams.	7		
6	Explain the following i) NAND gate and relay and PLC equivalents. ii) NOT gate and relay and PLC equivalents	8		
7	Compare programmable logic controllers with personal computers.	5	KTU May, October 2019	

Module 5				
Sl No.	Questions	Marks	KU/KTU	Instructional Objectives
1	What are the hardware elements of DCS?	5	KTU October 2019	
2	What are the key features of DCS?	5		
3	State the difference between SCADA and DCS	4	KTU, 2020	