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Jharkhand

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END TERM EXAMINATION
School of Engineering & IT

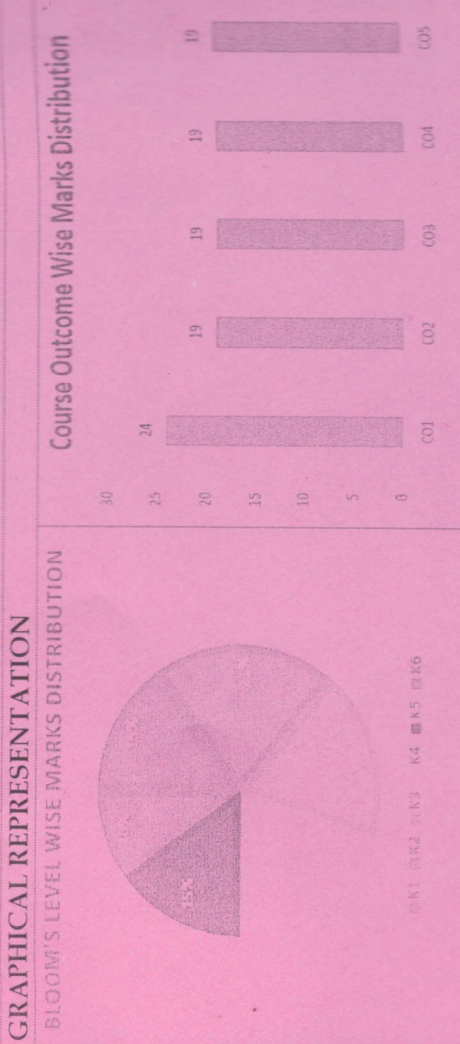
Branch	Electrical and Electronics Engineering	Program	B.Tech
Subject Name	Digital Signal Processing	Semester	VI
		Year	April 2024

Time: 3 Hour
Max. Marks: 70

- Start writing from 2nd page onwards; don't write on the 1st Page Backside
- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any Three out of Five of Section C
- Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will result in the Cancellation of the Papers.

Knowledge Level (KL)	K1 : Remembering
	K2 : Understanding
	K3 : Applying
	K4 : Analysing
	K5 : Evaluating
	K6 : Creating

Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Represent signals mathematically in continuous and discrete-time, and in the frequency domain.	
CO2	Understand the Discrete-Fourier Transform (DFT) and the FFT algorithms.	
CO3	Apply digital signal processing for the analysis of real-life signals.	
CO4	Analyse discrete-time systems using z-transform.	
CO5	Estimate the response parameters for digital filters.	



Section A (Each question Carry 02 Marks from Q1- i to x) – 20 Marks

Q. N	QUESTIONS	Marks	COS	KL	PO
1					
i	What is Nyquist rate?	2	CO3	K1	PO1
ii	Define the term aliasing.	2	CO3	K1	PO1
iii	What is the use of Fourier Transformation?	2	CO1	K1	PO1
iv	Give the expression for Fourier transform and inverse Fourier transform.	2	CO1	K2	PO1
v	Explain with an expression the term twiddle factor.	2	CO2	K3	PO2
vi	Explain the usefulness of the Z-transform.	2	CO4	K2	PO1
vii	What is a LTI system?	2	CO5	K1	PO2
viii	Explain the condition of stability for a signal.	2	CO5	K3	PO2
ix	Explain the significance of region of convergence (ROC) in Z-transform analysis.	2	CO4	K1	PO2
x	Give an example of static and dynamic system.	2	CO1	K2	PO2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carries 5 Marks)

12	Deduce Z Transform from DTFT and discuss its properties giving mathematical expression.	10	CO4	K2	PO1
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Q. No.	QUESTIONS	Marks	COS	KL	PO
2	Define mathematically the following signals and plot the same: i. Sinc Function ii. Unit Impulse Signal iii. Unit Step Signal	5	CO1	K1	PO1
3	Compute the Z-transform and determine the ROC for the sequence $x(n) = a^n u(n-1)$ $a < 1$	5	CO4	K4	PO1
4	A discrete-time signal is given by, $X(n) = \{1, 2, 2, 1, 4\}$ ↑ Sketch the following signals: i. $X(n-1) \cdot \delta(n-2)$ ii. $X(n) \cdot u(n-3)$	5	CO1	K4	PO2
5	Find the convolution of the signal $x(n) = (3, 1, 2, 4)$ where impulse response of the signal is $h(n) = (1, 3, 2, 1)$ using any method.	5	CO3	K3	PO1
6	What is sampling? How aliasing of a signal be avoided?	5	CO5	K5	PO1
7	Find the 4-point DFT of the sequence $x(n) = \cos \frac{n\pi}{4}$.	5	CO2	K2	PO2

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carries 10 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL	PO
8	Given $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$, find $X(k)$ using DIT FFT algorithm.	10	CO2	K5	PO1
9	Find the Fourier transform of a rectangle.	10	CO1	K6	PO2
10	The following function characterize an FIR filter with $M=11$. Determine the magnitude response and show that the phase and group delay are constant. $H(z) = \sum_{n=0}^{M-1} [h(n)z^{-n}]$	10	CO5	K3	PO2
11	Given the frequency-domain representation of a signal $X(k) = \{10, 2 + j3, -5, 0, 1 - j2, 0, 0, -1 + j2\}$, perform Decimation in Frequency FFT (using Radix-2 FFT algorithm) with $N = 8$. Show the intermediate steps of the FFT algorithm.	10	CO3	K4	PO1

CO1	Identify the tests on H. V. equipment and on insulating materials, as per the standards.
CO2	Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
CO3	Utilize the concept of generation and measurement of D.C., A.C., & Impulse voltages.
CO4	Analyze the causes for rise of over-voltages in a power system, and protection against these over voltages.
CO5	Design of insulation levels of various parts of power system.

GRAPHICAL REPRESENTATION

BLOOM'S LEVEL WISE MARKS DISTRIBUTION

Course Outcome Wise Marks Distribution



21/5/24 E 45



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Branch	Electrical and Electronics Engineering	Program	B.Tech
Subject Name	High Voltage Engineering	Semester	VI
		Year	April 2024
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x) – 20 Marks

Q. N	QUESTIONS	Marks	COs	KL	PO
1					
i	Explain the thermal electric break down curve.	2	CO4	K2	PO1
ii	Show the secondary breakdown and its condition.	2	CO5	K1	PO1
iii	Show any five applications of insulating material.	2	CO1	K1	PO1
iv	Demonstrate the mechanism of switching over voltage.	2	CO4	K4	PO1
v	What is the significance of impulse tests?	2	CO4	K3	PO2
vi	Explain the properties of gases Dielectric.	2	CO2	K5	PO1
vii	Analyze the mechanism for electrochemical breakdown in solid insulator.	2	CO2	K5	PO2
viii	Define the surge arrester.	2	CO4	K4	PO2
ix	Enlist the methods of impulse current measurement.	2	CO3	K6	PO2
x	Enlist the various standards for HV Testing of electrical apparatus.	2	CO3	K6	PO2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carries 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain the cascaded circuit diagram of High AC Voltage Generation.	5	CO1	K5	PO1
3	Explain the method of testing of power transformer.	5	CO1	K1	PO1
4	Discuss the working principle of electrostatic voltmeter.	5	CO3	K4	PO2
5	Explain clearly the procedure for the measurement of a.c. high voltages using sphere gap.	5	CO4	K6	PO1
6	Explain the following terms: (a) ripple factor (b) treeing and tracking (c) 50% flashover voltage.	5	CO4	K2	PO1
7	Explain the Townsends criterion for a spark.	5	CO5	K3	PO2

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	A ten stage Cockroft-walton circuit has all capacitors of 0.06 micro farad. The secondary voltage of the supply transformer is 100 kV of a frequency of 150 Hz. If the load current is 1 mA, determine (i) voltage regulation (ii) the ripple (iii) the optimum number of stages for maximum output voltage (iv) the maximum output voltage.	10	CO2	K5	PO1
9	Explain any five origin of switching over voltages in power network.	10	CO2	K2	PO2
10	Analyze the mathematical model used for suspended solid particle mechanism of liquid breakdown.	10	CO3	K1	PO2
11	Draw a standard lightning impulse voltage and explain its electrical generation circuit.	10	CO5	K3	PO1
12	Draw and explain the voltage doubler electrical circuit and develop the mathematical model of its ripple.	10	CO4	K4	PO1

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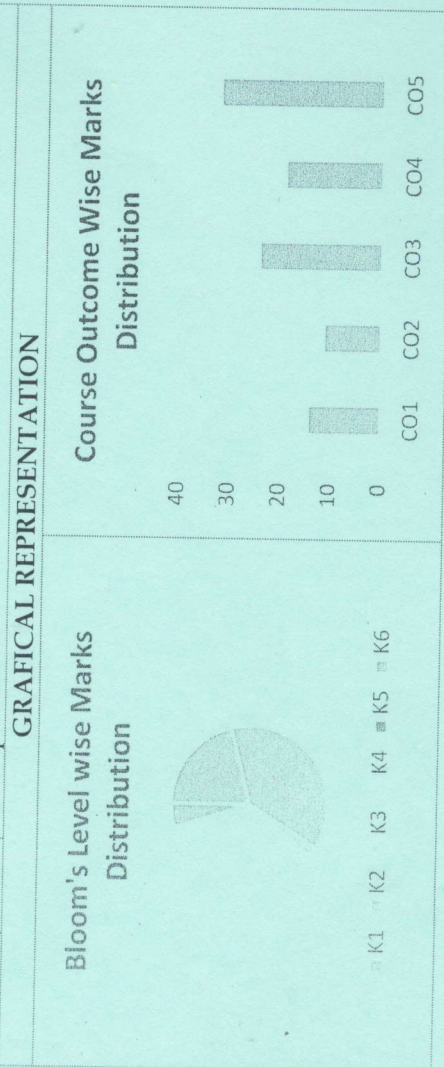
Branch	Electrical and Electronics Engineering	Program	B. Tech
Subject Name	Internet of Things	Semester	VI
		Year	April 2024

Time: 3 Hour
 Max. Marks : 70

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Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

CO1	Identify various tools and have basic implementation skills.
CO2	Understand of various aspect of Internet of Things (IoT)
CO3	Use real IoT protocols for communication.
CO4	Analyze the working of an IoT device with a Cloud Computing infrastructure.
CO5	Evaluate & verify the IoT data in the cloud and in between cloud providers.




Section A (Each question Carry 02 Marks from Q1-i to x) - 20 Marks			
Q. N1	QUESTIONS	Marks	COs / KL
i	What do you mean by "Sketch" in Arduino IDE?	2	CO1, K1
ii	What are the different components of IoT?	2	CO4, K2
iii	What are the advantages of IoT?	2	CO2, K4
iv	What is the function of Raspbian in Raspberry Pi?	2	CO5, K4
v	Explain IPV4 and IPV6 Protocols	2	CO3, K2
vi	What do you mean by PWM (Pulse Width Modulation)?	2	CO1, K1
vii	Mention the functions of Analog pins in Arduino Board.	2	CO2, K2
viii	What do you mean by BLE (Bluetooth Low Energy)?	2	CO2, K1
ix	Define Sensors and Actuators.	2	CO4, K2
x	What are different types of sensors in IoT?	2	CO3, K3

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carries 5 Marks)


Q. No.	QUESTIONS	Marks	COs	KL
2	What is Arduino? Mention the features of Arduino.	5	CO3	K4
3	Explain Zigbee and RFID with advantages and disadvantages.	5	CO2	K4
4	State different between Arduino and Raspberry Pi.	5	CO4	K2
5	Name some of the wearable Arduino Boards.	5	CO3	K6
6	State the difference between IoT and M2M.	5	CO2	K2
7	What do you mean by MQTT (Message Queue Telemetry Transport Protocol)? Explain how it works.	5	CO2	K1

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carries 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Write short notes on i) CoAP ii) XMPP iii) AMQP	10	CO3	K4
9	Write the python programming for interacting DHT22, Relay and Fan with Raspberry Pi.	10	CO1	K2
10	Sketch the python programming on Arduino IDE for DHT Sensor	10	CO4	K2
11	Sketch the python programming on Arduino IDE for Traffic control system	10	CO4	K4
12	Explain Software Defined Networking with a neat diagram.	10	CO5	K1



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Branch	Electrical and Electronics Engineering	Program	B.TECH
Subject Name	Intellectual Property Rights	Semester	VI
Year	April 2024		

Time: 3 Hour Max.
Marks : 70

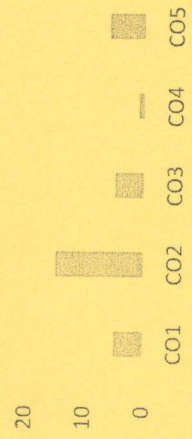
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Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



■ Course Outcome Wise Marks Distribution

GRAFICAL REPRESENTATION

CO1	Identify activities, constitute IP infringements and the remedies available to the IP owner, and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development.
CO2	Understand the knowledge on patent and copyright for their innovative research works.
CO3	Apply information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provide further way for developing their idea or innovations.
CO4	Apply the activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development.
CO5	Formulate the processes of Intellectual Property Management (IPM) and various approaches for IPM and conducting IP and IPM auditing.

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks						
Q.N	QUESTIONS	Marks	COs	KL	PO	
1	Define Intellectual Property rights. *	2	CO1	K1	PO1	
ii	Discuss about trademarks and service marks.	2	CO2	K1	PO2	
iii	Differentiate between a trade name and business name.	2	CO2	K1	PO2	
iv	What is the purpose of trademarks?	2	CO2	K1	PO2	
v	Define the right of reproduction.	2	CO2	K1	PO2	
vi	Discuss the issues of copyright ownership.	2	CO2	K1	PO2	
vii	Define trademark secret litigation.	2	CO2	K1	PO2	
viii	Discuss in brief about false advertising.	2	CO2	K1	PO2	
ix	Define trademark law.	2	CO3	K1	PO3	
x	Discuss in brief about intellectual property audits.	2	CO3	K1	PO3	

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Discuss the importance of intellectual property rights.	5	CO1	K2	PO1
3	List and explain about various types of trademarks in detail.	5	CO2	K4	PO2
4	Explain in detail about process involved in searching a patent.	5	CO2	K4	PO2
5	What are the new developments in patent Law? Explain.	5	CO2	K2	PO2
6	What are the differences between Product Patents and Process Patents?	5	CO4	K2	PO4
7	What is trade secret? Give any famous example of trade secret	5	CO4	K2	PO4

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Describe the common law rights under the 1976 copyright law.	10	CO1	K2	PO1
9	Discuss Comment on the Patent Act 1970 and its amendment. Explain in brief the Patent filing procedure.	10	CO1	K2	PO1
10	Explain the different types of trademarks with examples. What is the process of registering a trademark?	10	CO2	K2	PO2
11	Explain in detail about the international development in trade secrets law.	10	CO5	K6	PO5
12	Hypothetically, you are setting a new cold drink manufacturing company with new and innovative machineries and recipes. You plan to use your knowledge of IPR to safeguard your new company from old bigshot companies as well as new budding companies. Describe in details, what all rights you will register and how you will benefit out of it.	10	CO5	K5	PO5

CO1	Recognize the basics of power system economics.
CO2	Understand the monitoring and control of a power system.
CO3	Apply the methods to control the voltage, frequency and power flow.
CO4	Analyze the stability constraints in a synchronous grid.
CO5	Estimate the steady state parameters of power system using various numerical methods.
CO6	Formulate load flow & short circuit calculations.

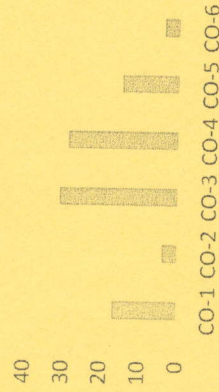
GRAFICAL REPRESENTATION


Bloom's level wise Marks Distribution




■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution





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Branch	Electrical and Electronics Engineering	Program	B. Tech
Subject Name	Power Systems-II	Semester	VI
		Year	April 2024

Time: 3 Hour
Max. Marks : 70

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Knowledge Level (KL)	K3 : Applying
K1 : Remembering	K5 : Evaluating
K2 : Understanding	K4 : Analysing
	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks

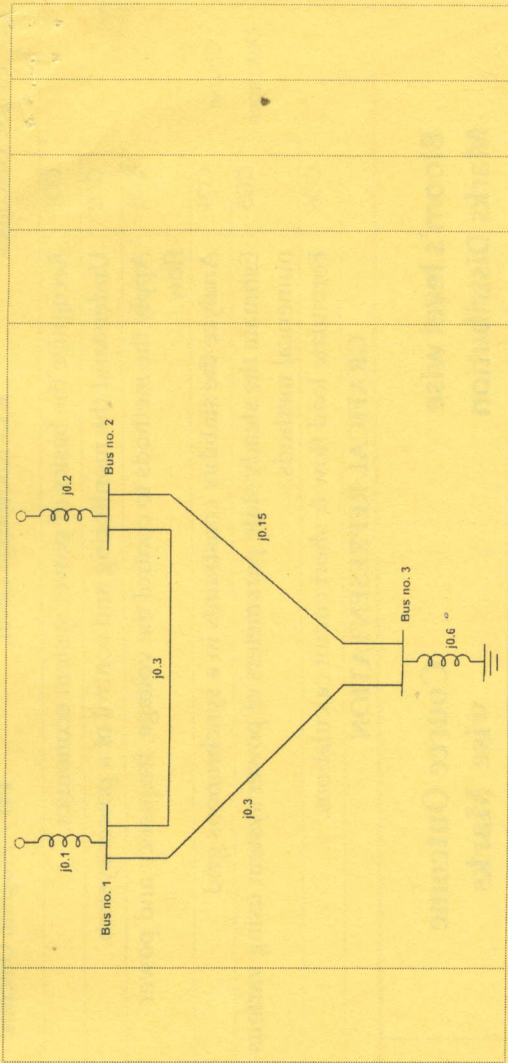
Q. N1	QUESTIONS	Marks	COs	KL	PO
i	What do you mean by load flow study?	2	CO2	K1	PO1
ii	Define bus in power system.	2	CO4	K1	PO1
iii	What are significance of swing curve?	2	CO6	K2	PO2
iv	What is swing equation?	2	CO6	K2	PO2
v	What is the function of AVR?	2	CO4	K2	PO3
vi	What are the major control loops used in large generators?	2	CO3	K2	PO4
vii	Write down the name of four types of Energy Control Centre.	2	CO1	K2	PO4
viii	What do you mean by contingency analysis?	2	CO3	K2	PO5
ix	What do you mean by spot pricing?	2	CO3	K4	PO2
x	What is the role of a power exchange?	2	CO2	K3	PO2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carries 5 Marks)


Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Classify the various types of buses in a power system for load flow studies. Justify the classification.	5	CO1	K2	PO3
3	Write down the difference between steady state and transient state stability?	5	CO1	K6	PO4
4	Write down the Computational Issues in Large-scale Power Systems.	5	CO1	K4	PO4
5	Explain briefly about the functions of state load dispatch centre.	5	CO3	K3	PO5
6	Consider two units of a plant that have fuel costs of $F_1 = 0.2P_1^2 + 40P_1 + 120$ Rs/h $F_2 = 0.25P_2^2 + 30P_2 + 150$ Rs/h Determine the economic operating schedule and the corresponding cost of generation for the demand of 180 MW.	5	CO5	K1	PO5
7	Write down the advantages and disadvantages of Gauss-Seidel method.	5	CO4	K2	PO6

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carries 10 Marks)


Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Write short notes on the following: (a) Wholesale Competition electricity Model (b) Transmission Pricing	10	CO5	K6	PO2
9	Derive the swing equation for a machine connected to an infinite bus in a power system.	10	CO3	K2	PO3
10	Describe about the load frequency and excitation voltage regulators of a turbo-generator.	10	CO4	K5	PO4
11	Describe about the functions of SCADA systems.	10	CO3	K5	PO5
12	Determine the Ybus matrix for the network shown below:	10	CO4	K2	PO6



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Branch	Electrical and Electronics Engineering	Program	B.Tech
Subject Name	Measurements and Instrumentation	Semester	VI
		Year	April 2024

Time: 3 Hour
Max. Marks: 70

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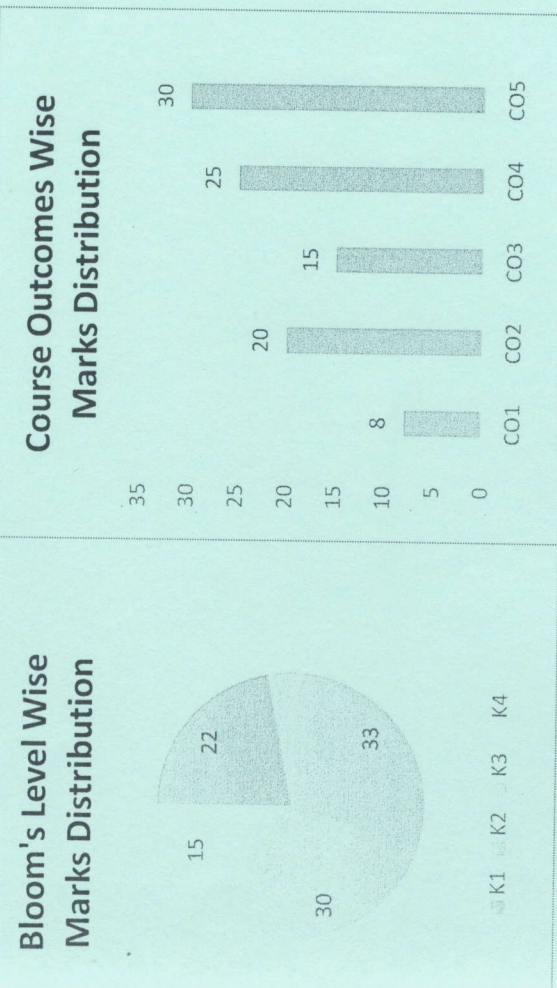
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Knowledge Level (KL)	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x) – 20 Marks

Q. N	QUESTIONS	Marks	COs	KL
1				
i	What is meant by measurement, mention the basic requirement of measurement.	2	CO2	K1
ii	Distinguish between the active & passive transducers.	2	CO2	K2
iii	What are the two methods for measurement?	2	CO1	K1
iv	Name the different essential torques in indicating instruments.	2	CO2	K1
v	Explain different types of errors that occur in measurements.	2	CO1	K1
vi	How the range of instrument can be extended in PMMC instruments.	2	CO1	K2
vii	Name the errors caused in Dynamometer type wattmeter.	2	CO2	K1
viii	List the advantages and disadvantages of single phase induction type energy meter.	2	CO1	K1
ix	Write the classification of resistances. Which method is used for different type of measurement of resistances.	2	CO2	K1
x	What is an Indicating instrument? Types of forces an indicating instrument uses.	2	CO1	K1

Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Understanding the working of various electrical bridges.	
CO2	Understanding the construction and working of various measuring instruments.	
CO3	Apply the energy conversion techniques.	
CO4	Analyze the different types of errors in measurement, calibration process and standards.	
CO5	Interpret the methods for measurement of non-electrical quantities like temperature, Pressure, Force, Torque, Density, Liquid level, Viscosity, Flow, Displacement etc.	



Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question Carries 5 Marks)

Q.No.	QUESTIONS	Marks	COs	KL
2	Explain the cases of extension range of PMMC Instrument.	5	CO2	K5
3	Derive an expression for actual ratio and phase angle for a potential transformer?	5	CO2	K4
4	3 resistances have the following ratings $R1 = 25\Omega \pm 5\%$, $R2 = 43\Omega \pm 2\%$, $R3 = 85\Omega \pm 5\%$. DETERMINE the magnitude and limiting error in ohms. If resistance is connected in series.	5	CO3	K4
5	Explain strain gauge for resistance measurement	5	CO3	K4
6	List the errors in a wattmeter and discuss in detail about error produced due to pressure coil inductance.	5	CO4	K4
7	Write the brief description of LVDT.	5	CO3	K4

Section C (Answer any THREE out of FIVE) - 30 Marks-
(Each question Carries 10 Marks)

Q.No.	QUESTIONS	Marks	COs	KL
8	Draw the block diagram of a general purpose oscilloscope(CRO) and explain function of each block in detail.	10	CO5	K3
9	Define Transducer. Write types of Transducer, Explain each of them in brief.	10	CO5	K5
10	Derive the expression for unknown resistance of kelvin bridge.	10	CO4	K6
11	Derive the expression for torque developed and controlling torque for PMMC AND PMMI instrument.	10	CO4	K2
12	Describe with a diagram the operation of a Q-meter . List the factor that causes error in Q-meter.	10	CO5	K3