



R22 Regulation

Subject code:4E5BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

**ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(EEE)**

Maximum Marks: 60

Date: 20.11.2025

Duration: 3 hours

- Note: 1.This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	Classify different types of Ammeters and Voltmeters	1M	1	1
b)	Recall any two advantages of MI Instruments.	1M	1	1
c)	Define Phase Angle Error.	1M	2	2
d)	Rephrase any two applications of A.C Potentiometer.	1M	2	2
e)	State the working principle of a dynamometer type wattmeter.	1M	3	1
f)	What is the differentiate between LPF and UPF wattmeter?	1M	3	2
g)	Name any two AC bridges used for measurement of inductance.	1M	4	1
h)	What is loss of charge method?	1M	4	2
i)	Write the working principle of LVDT.	1M	5	2
j)	What are the different methods to measure displacement?	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	a) Explain about source for different types of errors and precautions to minimize them.	5M	1	2 2
	b) The accuracy of five digital voltmeters is checked by using each of them to measure a standard 1.0000V from a calibration instrument. The voltmeter readings are as follows: V1=1.001v, V2=1.002v, V3=0.999v, V4=0.998v and V5=1.0000v. Calculate the average measured voltage and the average deviation.	5M		
OR				
3	a) With a neat diagram, explain the working of a True RMS responding volt meter.	5M	1	4 2
	b) A PMMC instrument has FSD of 100μA and a coil resistance of 1KΩ. Calculate the required shunt resistance value to convert the instrument into an ammeter with (i) FSD=100mA and (ii) FSD=1A.	5M		
4	Derive the expressions for ratio and phase angle errors in CT and PT.	10M	2	4
OR				

5	a) Identify the applications of A.C Potentiometer.	5M	2	3
	b) Illustrate the working principle and operation of D.C. Crompton's Potentiometer.	5M		2
6	Explain the construction and working of a dynamometer type wattmeter with torque expressions.	10M	3	2
OR				
7	Explain the methods of testing and calibration of energy meters using phantom loading.	10M	3	3
8	a) The basic AC bridge consists of the following constants: AB: $R=400\Omega$, BC: $R=150\Omega$, CD: unknown and DA: $R=100\Omega$ in series with $L=10mH$. Oscillator frequency is $1KHz$. Determine the constants of arm CD.	5M	4	4
	b) What is Wien's bridge? Derive the expression for the frequency.	5M		
OR				
9	a) Explain the operation of Kelvin's double bridge for low resistance measurement.	5M	4	2
	b) In the case of a Schering Bridge, arm Ac has $R=4.7k\Omega$. Arm CD has unknown elements. Arm BD has $C=0.1\mu F$ Arm AB= $4.7K\Omega$ is shunt with $1MF$. Determine Values of components is the arm CD.	5M		
10	a) Identify the Characteristics and choice of transducers.	5M	5	2
	b) Conclude the working of Strain gauge and its principle of operation.	5M		2
OR				
11	a) What is a transducer? Explain the working of Variable Capacitance transducer.	5M	5	3
	b) A 100Ω strain guage with a guage factor of 1 is affixed to a metal bar. The bar is stretched and this causes a change in resistance of 0.001Ω . Find the change in length if the original length is $10cm$.	5M		