Hall Ticket Number:

Code No. : 14368 O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.E.E.) IV-Semester Backlog Examinations, July/August-2023

Electrical Measurements &Instrumentation

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	State the principle of electro-static effect.	2	1	1	1,3,12
2.	List out the differences between MC and MI instruments.	2	1	1	1,3,12
3.	Write the expression for driving torque in single-phase induction type energy meter?	2	1	2	1,3,12
4.	Describe the main two coils in energy meter?	2	1	2	1,3,12
5.	Define the sensitivity galvanometer.	2	1	3	1,2,12
6.	Compare wheat stone bridge and substitution method to measure unknown resistance.	2	3	3	1,2,12
7.	List the types of instrument transformers.	2	1	4	1,2,12
8.	Classify AC potentiometer.	2	2	4	1,2,12
9.	Define the primary and secondary transducers?	2	1	5	1,2,12
10.	List out the factors to be considered for selecting a transducer.	2	1	5	1,2,12
	Part-B (5 × 8 = 40 Marks)				
11. a)	Draw and explain the PMMC instrument construction along with operation?	5	2	1	1,3,12
b)	A permanent magnet moving coil instrument has a coil of dimensions 15mm*12mm. The flux density in the air gap sis 1.8 mWb/sq.m and the spring constant is 0.14 microNm/Rad. Determine the number of turns required to produce an angular deflection of 90 deg. When a current of 5 mA is flowing through the coil.	3	3	1	1,3,12
12. a)	Explain the method of measuring unknown frequency in CRO using Lissajous patterns using required figures?	4	2	2	1,3,12
b)	The meter constant of a 230V, 10 A watthour meter is 1800 revolutions per kwh. The meter is tested at half load and rated voltage and UPF. The meter is found to make80 revolutions in 138 sec. Determine the meter error at half load.	4	3	2	1,3,12
13. a)	Draw and derive the unknown inductance expression of the HAY'S bridge?	5	3	3	1,2,12
b)	Explain the loss of charge method for measurement of High resistance.	3	3	3	1,2,12

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14. a)	Explain the operation of DC Crompton potentiometer with neat sketch.	4	2	4	1,2,12
b)	A CT has a bar primary & 200 secondary turns. The secondary burden is an ammeter of resistance 1.2 Ohm and reactance of 0.5 Ohm, the secondary winding has a resistance of 0.2 Ohm and reactance of 0.3 Ohm. The core requires the equivalent of an mmf of 100 A for magnetization and 50 A for core losses. Find the primary current and ratio error when the secondar ammeter indicates 5 A.?	4	3	4	1,2,12
15. a)	Explain the constructional details and working principle of LVDT with a neat sketch?	4	2	5	1,2,12
b)	A resistance wire strain gauge uses a soft iron wire of small diameter. The gauge factor is +4.2. Neglecting the piezoresistive effects, calculate the Poisson's ratio	4	3	5	1,2,12
16. a)	Derive the expression for value of multiplier in the multi-range voltmeter.	4	3	1	1,2,12
b)	Explain the operation of Weston Synchroscope.	4	2	2	1,2,12
17.	Answer any ***two*** of the following:				
a)	Draw and derive the expressions for unknown resistance using wheat stone bridge.	4	3	3	1,2,12
b)	Explain the calibration of Ammeter using potentiometer.	4	2	4	1,2,12
c)	Define transducer and discuss different types of transducers.	4	2	5	1,2,12

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	38.75%
iii)	Blooms Taxonomy Level – 3 & 4	41.25%

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