

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN

--	--	--	--	--	--	--	--	--	--

Course Code

2	2	E	E	4	6	1
---	---	---	---	---	---	---

Fourth Semester B.E. Degree Examinations, July 2026

ELECTRICAL AND ELECTRONICS MEASUREMENTS

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

Q. NoQuestionMarks(RBTL:CO: PI)**Module-1**

1.
 - a. Explain the measurement errors in wheat stone bridge. **04** (2 :1: 1.3.1)
 - b. Explain the working of wheat stone bridge and derive its balance equation. **08** (3 :1: 2.1.2)
 - c. The wheat stone bridge is shown in Fig. Q1(c). The galvanometer has a circuit sensitivity of 12 mm/ μ A. The internal resistance of galvanometer is 200 Ω . Calculate the deflection of the galvanometer caused due to 5 Ω unbalance in the arm AD. **08** (3 :1: 2.1.2)

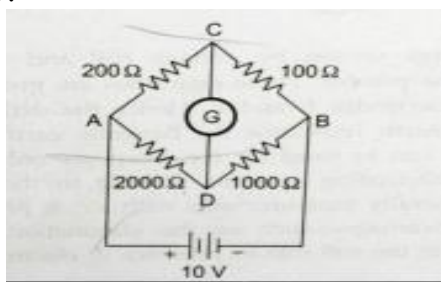


Fig. Q1(c)

(OR)

2.
 - a. Explain the terms power factor, loss angle and dissipation factor. **04** (2 :1: 1.3.1)
 - b. The ac bridge shown in Fig. Q 2(b) consists of the following constants: **08** (3 :1: 2.1.2)
 Arm AB: $R_1=400 \Omega$, arm BC: $R_2=150 \Omega$ in series with $C_2 = 0.2 \mu\text{F}$
 arm AD = 100 Ω in series with $L_3 = 10 \text{ mH}$. The source oscillatory frequency is 1kHz. Determine the constants of the arm CD.

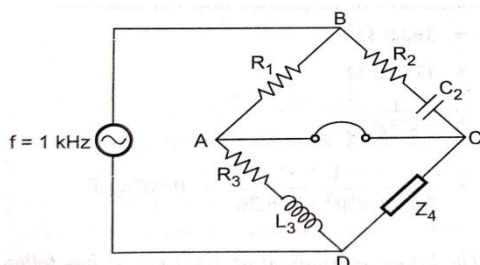


Fig. Q2(b)

- c. Derive the expression for Schering bridge to measure unknown value of capacitance. **08** (3 :1: 2.1.2)

Module-2

3.
 - a. Explain the errors in dynamo meter type watt meter due to the method of connection and pressure coil capacitance. **04** (2 :2: 1.3.1)

	b.	A watt meter has a current coil of $0.03\ \Omega$ resistance and a pressure coil of $6000\ \Omega$ resistance. Calculate the percentage error if the watt meter is so connected that (i) The current coil is on the load side (ii) The pressure coil is on the load side (iii) If the load takes 20A at a voltage of 220V and 0.6 p.f. in each case (iv) What load current would give equal errors with the two connections?	08	(3 :2: 2.1.2)
	c.	With necessary diagram explain low power factor electro dynamo type watt meter.	08	(2 :2: 2.1.2)
		(OR)		
4.	a.	Write a short note on calibration of an Energy meter.	04	(2 :2: 1.3.1)
	b.	The meter constant of 230 V, 10 A watt hour meter is 1800 revolutions per kWh. The meter is tested for half load & rated voltage & unity power factor. The meter is found to make 80 revolutions in 138 seconds. Determine the meter error at half load.	08	(3 :2: 2.1.2)
	c.	With a neat diagram, explain the construction and working principle of single phase induction type energy meter.	08	(2:2: 1.3.1)
		<u>Module-3</u>		
5.	a.	List out the precautions to be taken while using voltmeter and ammeter.	04	(2 :3: 1.3.1)
	b.	A moving coil ammeter has fixed shunt of $0.01\ \Omega$ with a coil resistance of $750\ \Omega$ and a voltage drop of 400 mV across it, the full scale deflection is obtained. (i) Calculate the current through the shunt. (ii) Calculate the resistance of meter to give full deflection if the shunted current is 50 A.	08	(3 :3: 2.1.2)
	c.	Explain the Silsbee's method of testing CT.	08	(2 :3: 2.1.2)
		(OR)		
6.	a.	Write a short note on leakage factor.	04	(2 :3: 1.3.1)
	b.	A current transformer has a single turn primary and 400 secondary turns. The magnetising current is 90 A while core loss current is 40 A. Secondary circuit phase angle is 28° . Calculate the primary current & ratio error when secondary carries 5 A current.	08	(3 :3: 2.1.2)
	c.	With necessary diagram, explain working of flux meter.	08	(2 :3: 1.3.1)
		<u>Module-4</u>		
7.	a.	Define electronic voltmeter and write the advantages.	04	(2 :4: 1.3.1)
	b.	With necessary sketch, explain Electronic multi meter to measure DC and AC voltage.	08	(2 :4: 1.3.1)
	c.	With necessary diagram, explain true RMS reading voltmeter.	08	(2 :4: 1.3.1)
		(OR)		
8.	a.	Write the advantages Digital voltmeters.	04	(2 :4: 1.3.1)
	b.	With necessary diagram, explain staircase type DVM	08	(2 :4: 1.3.1)
	c.	Define Q meter. Derive the expression for measurement of low impedance components.	08	(3 :4: 2.1.2)
		<u>Module-5</u>		
9.	a.	Write a short note on dot matrix display.	04	(2 :5: 1.3.1)
	b.	With necessary sketch, explain any one type of Seven segment display.	08	(2 :5: 1.3.1)
	c.	With necessary sketch explain operation and construction of LED	08	(2 :5: 1.3.1)
		(OR)		
10.	a.	Writ a short note on Electro cardio Graph (ECG).	04	(2 :5: 1.3.1)
	b.	With necessary sketch explain X-Y recorders.	08	(2 :5: 1.3.1)
	c.	With neat sketch explain Strip chart recorder.	08	(2 :5: 1.3.1)

** ** *