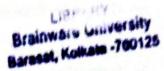




## **BRAINWARE UNIVERSITY**



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Term End Examination 2023
Programme – Dip.EE-2018/Dip.EE-2019/Dip.EE-2021
Course Name – Electrical Measuring Instrument
Course Code - DEE402
( Semester IV )

Full Marks : 60 Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

## Group-A

(Multiple Choice Type Question)

1 x 15=15

- 1. Choose the correct alternative from the following:
- (i) What is the working principle of an analog multimeter?
  - a) An analog multimeter uses a microprocessor to measure the electrical quantity
  - c) An analog multimeter uses a voltage comparator to measure the electrical quantity.
- b) An analog multimeter uses a moving coil meter to measure the electrical quantity.
- d) An analog multimeter uses a digital-toanalog converter to measure the electrical quantity.
- (ii) Which of the following is true about a three-phase power factor meter?
  - a) It measures the power factor of a threephase circuit only
- b) It uses a dynamometer to measure the power factor
- c) It is only suitable for measuring small loads
- d) All of the above
- (iii) In Maxwell's inductance bridge, which of the following is varied to balance the bridge?
  - a) Resistance

b) Inductance

c) Capacitance

- d) Frequency
- (iv) Identify why a purely mechanical instruments cannot be used for dynamic measurements because they have
  - a) large time constant

b) higher response time

c) high inertia

- d) all of the above
- (v) Select the main advantage of the null balance technique of measurement is that
  - a) it gives a quick measurement
- b) it does not load the medium
- c) it gives a center zero value at its input
- d) it is not affected by temperature variation
- (vi) In which of the following conditions Earth Resistance measurement is not possible?
  - a) Dry weather

b) Moisture content in the soil is high

c) Soil is sandy

- d) None of the above
- (vii) What is the formula for calculating power?
  - a) Power = Work x Time

b) Power = Energy x Time

c) Power = Force x Distance

d) Power = Voltage x Current

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(viii) Choose the principle of operation of a digital m		
<ul> <li>a) It uses a moving-coil or moving-iron meter to measure current or voltage</li> </ul>	<ul> <li>b) It uses a microcontroller and an an digital converter to measure current voltage, and resistance</li> </ul>	
c) It uses a thermocouple to measure	d) It uses a pressure sensor to measu	re
temperature	pressure	
(ix) Which of the following is a common unit for ex	pressing the power output of engines?	
al Watt (W) (hp)	b) Newton (N) d) Joule (J)	
(x) Explain the purpose of a calibration procedure	for a meter	
<ul> <li>a) To adjust the meter to the correct range and resolution</li> </ul>	<ul> <li>b) To check the accuracy and linearity meter</li> </ul>	y of the
<ul> <li>c) To verify the meter's compliance with international standards</li> </ul>	d) All of the above	
(xi) Which of the following is a measure of the rate	e at which work is done?	
a) Energy	b) Voltage	
c) Current	d) Power	
(xii) Identify the quantities represents the power in	an AC circuit.	
a) Current	b) Voltage .	
c) Resistance	d) Wattage .	
(xiii) Predict the relationship between power factor	and efficiency.	
a) Directly proportional	b) Inversely Proportional	
c) Undefined	d) No relationship	
(xiv) An electrodynamometer type of instrument fir	nds its major use as	
a) standard instrument only c) transfer instrument only	b) both as standard and transfer inst d) indicator-type instrument	rument
(xv) Select which of the following instruments is corresistances.		
a) Kelvin Double bridge	b) Wheatstone bridge	
c) Megger	d) All of the above	
Gro	up-B	
	Type Questions)	3 x 5=15
2. Define random arrors and explain how they are	analysed statistically	(3)
<ol> <li>Define random errors and explain how they are analysed statistically.</li> <li>Explain the applications of Wheatstone bridge.</li> </ol>		(3)
4. Differentiate between accuracy and precision.		(3)
<ol> <li>Discuss the advantages and disadvantages of Maunknown inductance.</li> </ol>	xwell's bridge for measurement of	(3)
6. How to select an ammeter?		(3)
	OR .	
Explain the working of PMMC type instruments.		(3)
	up-C	
(Long Answer	Type Questions)	5 x 6=30
7. Two wattmeters connected to measure the inp	ut to a balance three phase circuit indi	cate (5)
2000watt and 500watt respectively . Calculate		<b>(E)</b>
8. How is current transformer used in current med		(5) (5)
9. Develop the block diagram of digital multimete	r.	(5)
10. Evaluate the features of a digital multimeter.		(5)
11. Define accuracy, precision, resolution with exar	npie.	(3)

12. Describe the construction of PMMC type instruments with neat diagram.

OR

Describe the construction of wattmeter with neat diagram.

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(5)

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