

Sub: **Electrical Measurements**  
Time: 1½ Hrs.

Date: 6-11-2017  
Max Marks: 30M

**Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.**

S.no	Question	Marks	Unit	CO	Cognitive Level
1.a)	Define the energy meter constant.	2	3	C303.3	Remember
1.b)	Define the power factor.	2	3	C303.2	Remember
1.c)	Describe the disadvantages of shunts compare with instrument transformers.	2	4	C303.2	Remember
1.d)	Classify the ballistic tests.	2	5	C303.5	Understand
1.e)	Explain how to calibrate voltmeter by using DC potentiometer	2	4	C303.3	Understand
2.	Derive the equation for driving torque for dynamometer wattmeter for measure the power	10	3	C303.3	Understand
3.	Derive the equation of transformation ratio and phase angle of potential transformer and explain the design considerations to reduce the turn's ratio and phase angle errors.	10	4	C303.2	Understand
4.	Describe the dynamometer type power factor meter construction and operation.	10	3	C303.2	Understand
5.	Describe the determination of B-H curve by using method of reversals.	10	5	C303.5	Understand

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1.a)	Illustrate power factor in two wattmeter method.	2	3	C303.3	Remember
1.b)	Explain the advantages of instrument transformer.	2	4	C303.2	Remember
1.c)	List the three types of methods used for measurement of iron losses in ferromagnetic materials	2	5	C303.5	Remember
1.d)	Illustrate the equation of phase angle of current transformer	2	4	C303.2	Understand
1.e)	Define the problem creep in energy meter and explain the compensation.	2	3	C303.3	Understand
2.	Describe the operation of two wattmeter method and derive the power factor.	10	3	C303.3	Understand
3.	Describe the construction of current transformer and derive the equation for transformation ratio and phase angle. Explain the design considerations to reduce the turns ratio and phase angle errors.	10	4	C303.2	Understand
4.	Explain the operation of gaitinsley potentiometer	10	4	C303.3	Understand
5.	Describe the operation of flux meter and derive the equation of flux.	10	2	C303.5	Understand

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1.a)	Give the reasons for using ring-type specimens for ballistic tests	2	5	C303.5	Remember
1.b)	Define the power and energy.	2	3	C303.3	Remember
1.c)	Describe the difference between potential transformer and current transformer.	2	4	C303.2	Remember
1.d)	Why the secondary of current transformer should not open when primary taking the current.	2	4	C303.2	Remember
1.e)	Describe the equation for time period oscillation for ballistic galvanometer.	2	5	C303.5	Remember
2.	Describe the moving iron power factor meter and explain the advantages and disadvantages.	10	3	C303.2	Understand
3.	Derive the equation of transformation ratio and phase angle of potential transformer and explain the design considerations to reduce the turn's ratio and phase angle errors.	10	4	C303.2	Understand
4.	Describe the ballistic galvanometer operation and derive the charge equation.	10	5	C303.5	Understand
5.	Explain the applications of DC potentiometer.	10	4	C303.3	Understand

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1.b)	Define ratio correction factor for instrument transformer.	2	4	C303.2	Remember
1.c)	Define the phase angle in current transformer and potential transformer.	2	4	C303.2	Remember
1.d)	Describe the difference between galvanometer and ballistic galvanometer.	2	5	C303.5	Remember
1.e)	Define the power and energy.	2	3	C303.3	Remember
2.a)	Classify and explain the single phase electrodynamic power factor meters.	5	3	C303.2	Understand
2.b)	Describe the poly phase energy meter with neat diagram.	5	3	C303.3	Understand
3.	Describe the construction of current transformer and derive the equation for transformation ratio and phase angle. Explain the design considerations to reduce the turn's ratio and phase angle errors.	10	4	C303.2	Understand
4.	Describe the operation of flux meter and derive the equation of flux.	10	5	C303.5	Understand
5.	Describe the DC Crompton potentiometer with neat sketch and explain the applications.	10	4	C303.3	Understand

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