

II B. Tech II Semester Supplementary Examinations, November - 2019**ELECTRICAL MEASUREMENTS**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) What are the errors usually occur in PMMC instruments. (2M)
- b) The following readings were obtained from 3 voltmeters used for a single phase power instrument:  $V_2=180$  volts across a non-inductive resistor,  $V_3=200$  volts across an inductive load,  $V_1=300$  volts across the two in series. Calculate the power factor of the inductive load. (3M)
- c) What is the basic principle used in potentiometer. (2M)
- d) A simple slide wire is used for the measurement of current in a circuit. The voltage across a standard resistance of  $1\Omega$  is balanced at 75 cm. Find the magnitude of the current if the standard cell having an e.m.f. of 1.45 volts is balanced at 50 cm. (3M)
- e) Discuss briefly about magnetic moment? (2M)
- f) Write the advantages of digital voltmeters. (2M)

**PART -B**

2. a) What are the essential differences between a moving coil and a moving iron instruments? (7M)
- b) A 15V moving iron voltmeter has a resistance of  $500\Omega$  and inductance of 0.12H. (7M)  
Assuming that this instrument reads correctly on D.C. what will be its reading on A.C. at 15V when the frequency is (i) 25 Hz and (ii) 100 Hz?
3. a) Explain with the help of neat diagram how would you extend range of a wattmeter using C.T. and P.T. (7M)
- b) Explain how you measure the total power in a 3-phase circuit with the help of two-wattmeter's only. (7M)
4. a) Describe the construction and working of a polar type potentiometer. Explain the method for standardizing it. (7M)
- b) Explain the principle of a rectangular type coordinate A.C. potentiometer. Draw a diagram of scheme of connections and describe how the potentiometer is standardized. (7M)
5. a) State the various methods of measurement of low resistance. Why is the voltmeter-ammeter method unsuitable for the precise measurement of low resistance? (7M)
- b) Explain the working principle of Kelvin's double bridge method for measurement of low resistance. (7M)

6. a) Describe how magnetizing and loss components of no load current of a transformer be determined by using as A.C. potentiometer. s (7M)  
b) Explain a method for testing of permanent magnets. What precautions should be taken in magnetic testing? (7M)
7. a) Explain how does a digital system differ from an analog system? (7M)  
b) With the help of a block diagram, describe briefly the working of a successive approximation digital voltmeter. (7M)

