Printed Pages : 4

EE201

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199213

Roll No.

B. Tech.

(SEM. II) THEORY EXAMINATION, 2014-15

ELECTRICAL ENGINEERING

Time : 3 Hours] [Total Marks : 100

Note : Attempt **All** Questions. **All** Questions carry **equal** marks.

1 Answer any four parts of the following : **5x4=20**

a) Three resistances r, 2r and 3r are connected in delta. Determine the resistances for anequivalent star connection. Prove formula used.

b) State and explain Super position theorem. Determine the current through 6Ω resistor.

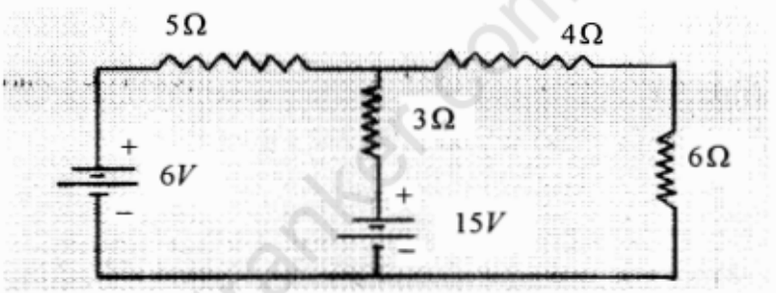

Fig.1

Attempt any two of the following questions : **7×2=14**

2 (a) Explain the working principle of stroboscope.

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Explain the principle of thermo couple. Also explain their calibration method.

(b) With neat sketch explain the construction and working of bourdon tube pressure gauge.

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Discuss different types of load cells.

(c) Describe strain gauge. What are Rosette gauges, explain with advantages, limitations and application?

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Write working of vibrometer.

Attempt any two of the following questions : **6×2=12**

3 (a) A hole and mating shaft are to have a nominal assembly size of 50 mm. The assembly is to have a maximum clearance of 0.15 mm. and a minimum clearance of 0.05 mm. The hole tolerance is 1.5 times the shaft tolerance. Determine the limits for both hole and shaft. By using

i. Hole Basis system

ii. Shaft Basis system.

(b) Describe with sketch the construction and working of a micrometer. Explain how least count is found and reading is taken. What is zero error?

(c) Explain why special attention should be given to GO gauges compared to NOT GO gauges during the design of gauges.

Attempt any two of the following questions : **6×2=12**

4 (a) Explain the terms "Primary texture" and "Secondary texture". Also explain principle of Auto-Collimator.

(b) Sketch two wire methods for measuring effective diameter of screw thread. Also give its limitation. Also define Flatness and describe a method to find out the flatness of a surface plate.

(c) Write the principle of interferometers and also describe working of Tomlinson surface tester for surface measurement.

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c) Explain the principle of operation of a single phase transformer.

A 230/460 V transformer has a primary resistance of $0.2\,\Omega$ and a resistance of $0.5\,\Omega$ and the corresponding values for the secondary are $0.75\,\Omega$ and $1.8\,\Omega$ respectively. Find the secondary terminal voltage when supplying

(i) 10 A at 0.8 p.f. lagging

(ii) 10 A at 0.8 p.f. leading.

4 Answer any two parts of the following: **10x2=2**

a) Explain two wattmeter method to measure three phase power with suitable diagram.

b) Power in a 3-phase circuit is measured by two wattmeters and the readings of the wattmeters are 5 kW and 0.5 kW, the latter reading being obtained after reversal of the current coil connection. Find the total power, and power factor of the circuit.

c) Explain different types of d.c. machines and derive emf equation.

5 Answer any two parts of the following: **10x2=20**

a) Rotor of 3 phase induction motor cannot run at synchronous speed. Explain a three phase slip ring, 4 pole induction motor has rotor frequency 2.0 Hz while connected to 400 V, 3 phase, 50 Hz supply determine slip and rotor speed.

b) Draw torque-speed characteristics of 3 phaseinduction motor. Show the different operatingregions. What will happen if rotor resistance ofmotor changes?

c) Why single phase induction motor is not self-starting? Explain method to start it.