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University Examinations 2013/2014

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN
ELECTRICAL INSTALLATION

EEE 0122: ELECTRICAL ENGINEERING PRINCIPLES III

DATE: APRIL 2014

TIME: 1 ½ HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE – (30 MARKS)

- (a) Using labelled diagrams, explain the constructional features of a dc motors. (7 Marks)
- (b) The power of 3-phase circuit is measured by two watt meters method. If the total power is 100KW and power factor is 0.66. What will be the reading of each watt meter? (5 Marks)
- (c) Distinguish between star load connections and Delta load connections (using diagrams). In each case show the live and phase current and voltages. (7 Marks)
- (d) Explain fullwave-bridge rectification, illustrating with waveforms at each stage. (7 Marks)
- (e) State four advantages of capacitor start, capacitor run single phase motor. (4 Marks)

QUESTION TWO – (15 MARKS)

- (a) Define the following terms:
 - (i) Rectification
 - (ii) Filtering (2 Marks)
- (b) Explain the construction and operation of centre tapped full wave rectifier. (5 Marks)
- (c) State four
 - (i) Advantages of DC motors

- (ii) Application of DC motors (8 Marks)

QUESTION THREE – (15 MARKS)

- (a) Using well labelled diagrams explain the operation of a DC motor starter. (6 Marks)
- (b) Explain three methods of power measurements in a three phase supply systems. (9 Marks)

QUESTION FOUR – (15 MARKS)

- (a) Using schematic and phasor diagrams, explain the operation of capacitor start/capacitor run motors. (7 Marks)
- (b) A three phase motor rated 25KW supplied by 415 volts is running at power factor 0.85 lagging. Calculate the line current. (4 Marks)
- (c) Explain any method of speed control in DC motors. (4 Marks)