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 **MUEO**

 **MOI UNIVERSITY**

 OFFICE OF THE DEPUTY VICE CHANCELLOR

 (ACADEMIC, RESEARCH & EXTENSION)

 UNIVERSITY EXAMINATIONS

 2015/2016 ACADEMIC YEAR

 SECOND YEAR SECOND SEMESTER EXAMINATION

 **FOR THE DEGREE OF**

**BACHELOR OF ENGINEERING**

**IN**

**CHEMICAL AND PROCESS ENGINEERING AND**

**MANUFACTURING. INDUSTRIAL & TEXTILE**

**ENGINEERING**

**COURSE CODE: ECE 202**

**COURSE TITLE: ELECTRICAL TECHNOLOGY II**

**DATE: 26TH APRIL, 2016 TIME: 2.00P.M. - 5.00P.M.**

**INSTRUCTION TO CANDIDATES**

* ANSWER ANY FIVE QUESTIONS.
* ALL QUESTIONS CARRY EQUAL MARKS.

THIS PAPER CONSISTS OF (3) PRINTED PAGES PLEASE TURN OVER

 QUESTION ONE

1. Deduce the criterion for choice of voltage for transmission and distribution systems. [7]
2. A load of 685MW at 0.9 power factor lagging and 200MVar capacitor bank is connected to the receiving end of the line. If the voltage at the receiving end of the line. If the voltage at the receiving end equals to its rated value,
3. Determine line current at the receiving end of the line [2]
4. Calculate sending end voltage, [3]
5. Calculate sending end current. [2]

 QUESTION TWO

1. Differentiate between feeder, distributor and service main [3]
2. State three problems of power system interconnection [3]
3. The power input to a 500V, 60Hz, 6 pole 3 phase squirrel cage induction motor running at 975 rpm is 40KW. The stator losses are 1 KW and the friction and windage losses are 2KW. Calculate
4. Slip [2]
5. Rotor copper losses [2]
6. Mechanical power developed [2]
7. The efficiency [2]

 QUESTION THREE

1. Analyse three advantages of an interconnected power system [3]
2. The shaft output of a three-phase 60Hz induction motor is 80KW. The friction and windage losses are 920W, the stator core loss is 4300W and the stator copper loss is 2690W. The rotor current and rotor resistance referred to stator are respectively 110A and 0.15ohms. If the slip is 3.8%, what is the percent efficiency? [11]

QUESTION FOUR

1. Give the layout of a typical thermal power plant and briefly explain the working of the super heater and the condenser [7]
2. For a small and sensitive servo mechanism give reasons why a.c. servo motors are generally preferred to d.c. servo motor [7]

QUESTION FIVE

1. What are the four fundamental differences between thermal and nuclear power plants? [4]
2. A 240V d.c. series motor has an armature resistance of 0.2 ohms and series field resistance of 0.10 ohms. Determine :
3. The current required to develop a torque of 70 Nm at 1200 rpm [5]
4. Percentage reduction in flux when the machine runs at 2000 rpm at half the current [5]

 QUESTION SIX

1. Explain three ways in which speed of a DC shunt motor is controlled [5]
2. In what respect does a 1-phase induction motor differ from a 3-phase induction motor? [3]
3. Give the layout of a hydro-electric power plant and briefly explain the working of any two

of its main components [6]

 QUESTION SEVEN

1. Define a captive power plant [2]
2. Discuss any four ways in which DC motors are started [8]
3. Compare and contrast the induction motor with a transformer [4]