MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS

UNIVERSITY ORDINARY EXAMINATION

2020/2021 ACADEMIC YEAR

SECOND YEAR **FIRST** SEMESTER EXAMINATION FOR, DIPLOMA IN ELECTRICAL AND ELECTRONICS

UNIT CODE: EEE 075

UNIT TITLE: POWER SYSTEM

DURATION: 2 HOURS

Instructions to candidates:

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) Define the following terms in relation to power systems.
   i. Synchronization (1mark)
   ii. Excitation (1mark)
   iii. String efficiency (1mark)
   iv. Power factor (1mark)
   v. Economic of power generation (1mark)

b) List four features of electrical conductor used in overhead transmission lines (4marks))

c) Highlight five properties of line support (5marks)

d) Briefly explain three types of alternators used in power system (6marks)

e) Discuss the effect of lagging power factor of load armature reactions (6marks)

f) Compare a nuclear power and hydropower plants (4marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION **TWO (20 MARKS)**

i. List five factors to be considered while selecting a power generating stations site (5marks)

ii. With the aid of a neat sketch explain the general layouts of a hydro electric power plant (15marks)

QUESTION THREE (20 MARKS**)**

i. Briefly explain any four causes of low power factor in power plants. (8marks)

ii. Explain three methods of power factor improvement (12marks)

QUESTION FOUR (20 MARKS)

i. With the aid of a graph explain straight line method as used in power generation (8marks)

ii. The equipment in a power station costs Ksh 1660,000 and has a salvage value of Kshs 70,000 at the end of the 25 years .Determine the depreciation value of the equipment at the end of 20 years on the following methods.
   a) Straight line method
   b) diminishing value method
   c) sinking fund mutual at 5% compound interest annually (12marks)