



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EPC 203: POWER GENERATION, TRANSMISSIONS AND DISTRIBUTION

DATE: 3/8/2016

TIME: 2:00 – 4:00 pm

SECTION A

1. a) State any FIVE Advantages and FIVE disadvantages of hydroelectric power station. (10 marks)
- b) State ANY THREE sources of electrical power. (6 marks)
- c) With the aid of a well labeled diagram, explain the construction of steam power station. (14 marks)

SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION

2. a) Define the following terms as used in Economics of power.
 - i) Max demand
 - ii) Plant capacity
 - iii) Diversity factor
 - iv) Demand factor(8 marks)
- b) A generating station supplies the following loads; 13000KW, 80000KW, 6000KW and 400KW. The station has a Max demand of 20000KW. The annual load factor of station is 45%. Calculate:

- i) Diversity factor
 - ii) The demand factor
 - iii) The number of units supplied annually (12 marks)
- 3.
 - a) State any Five factors to be considered when selecting a steam power plant site.
 - b) State and explain ANY five factors to be considered when selecting a Hydroelectric plant site (10 marks)
 - c) With the aid of a diagram. Explain the operation of a Nuclear reactor. (10 marks)
- 4.
 - a)
 - i) Define a tariff with reference to economics of power generation.(2 marks)
 - ii) Explain ANY three types of tariffs used in power generation. (9 marks)
 - b) Explain the importance's of load curves in a generating plant. (9 marks)
- 5.
 - a) A hydroelectric power station has a reservoir of area 3.4 square kilometers and capacity of $6 \times 10^6 \text{ m}^3$. The penstock turbine and generation efficiencies are respectively 90%, 94% and 80%.

Calculate:

- i) The total Electrical energy that can be generated from the power station.
 - ii) If a load of 14000KW has been supplied for 4 hours, find the fall in reservoir level. (16 marks)
- b) Explain TWO advantages of Wind as a source of power. (4 marks)