



FACULTY OF ENGINEERING & TECHNOLOGY
KENYA INSTITUTE OF HIGHWAYS & BUILDING TECHNOLOGY (KIHBT)

DEPARTMENT OF ELECTRICAL & ELECTRICAL ENGINEERING

UNIVERSITY EXAMINATION FOR:
HIGHER DIPLOMA IN ELECTRICAL AND ELECTRONIC
ENGINEERING

EEE 3203: ELECTRICAL BUILDING SERVICES ENGINEERING

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2017

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. You should have the following for this examination:
 - *Answer Booklet*
 - *Examination pass*
 - *Student ID*
2. This paper consists of **FIVE** questions. Attempt any **THREE** Questions
3. **Do not write on the question paper.**
This paper consists of **FOUR** printed pages

QUESTION ONE

(a) (i) State the main difference between a bar chart and a Gantt chart in project implementation planning. **(2marks)**

(ii). Define the following terms in CPM project planning

- EVENT

-ACTIVITY

-FLOAT

(6 Marks)

b) A certain engineering project had activities with costs and duration as shown in table II below. Using the critical path method (CPM) construct the network and Determination.

(i) The critical path of the network and state the duration of the project.

(ii) The total cost of the project.

(iii) Float for activities C, E and G.

Activity	Period years	Cost	Event No.	Activity	Period Years	Cost	Event No.
A	3	2 M	1 – 2	H	1 ½	3 M	5 – 7
B	4	4 M	1 – 3	I	0	1 M	6 – 7
C	3	6 M	2 – 4	J	1	1 M	6 – 8
D	2	2 M	2 – 5	K	½	1 M	7 – 8
E	3	7.5 M	3 – 5	L	½		8 -9
F	0	1 M	4 – 6				
G	3	2M	5 – 6				

(12 Marks)

QUESTION TWO

(a) State:

(i) Four factors to consider when choosing a wiring system.

(ii) Two regulations requirements for a temporary installation.

(6 Marks)

(b) Define:-

(i) The term wiring system

(ii) Temporary installation

(6 Marks)

(c) Explain:-

(i) Diversity in electrical installations

(ii) With the aid of a diagram draw the mechanism of a single phase residual current Earth Leakage circuit breaker (ELCB).

(8 Marks)

QUESTION THREE

(a) (i) Explain how a discharge lamp works

(ii) Describe an indirect lighting system.

(6 marks)

(b) A corridor is lit by 4 lamps spaced 10 m apart and suspended at a height of 5 m above the center line of the floor. If each lamp gives 200 cd in all direction below the horizontal, find the illumination at the point on the floor mid-way between the second and the third lamps. **(7 Marks)**

(c) Two lamps A and B of 300 cd and 500 cd respectively are situated 200 apart. The heights A above the ground level are 15M and that of B is 20 M. if a photo meter is placed at the center of the line joining the two lamps on the ground, calculate the reading of the photo meter.

(7 Marks)

QUESTION FOUR

(a) State:

(i) Four considerations that determine the requirement for lightning protection in a building.

(ii) Four types of lightning.

(4 Marks)

(b) Describe the lightning stroke and give its effects. **(6 Marks)**

(c) Explain:

(i) Four principal components of a lightning protection system

(ii) Zone of protection

(iii) Reasons for overlapping zones of protection aided by a drawing. **(10 Marks)**

QUESTION FIVE

(a) Distinguish the roles of the following personnel in a construction project.

(i) Main contractor

(ii) Clerk of works

(iii) Project Manager. **(6 Marks)**

(b) Explain any THREE possible remedies for a breach of contract. **(4 Marks)**

(c) Explain the following types of contracts.

(i) Bill of quantities

(ii) Cost reimbursement **(4 Marks)**

(d) Explain any four factors to be considered when selecting the best possible technical services provider for an organization. **(6 Marks)**