



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

HIGHER DIPLOMA IN ELECTRICAL ELECTRONICS ENGINEERING (HDEEE) PP2

EEE3207: ELECTRICAL BUILDING SERVICES ENGINEERING

END OF SEMESTER EXAMINATION

SERIES: MAY 2016

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** Questions;

Attempt any **THREE** Questions.

Do not write on the question paper

QUESTION ONE

- (a) A school laboratory 15m long and 10m wide requires an illumination level of 400lux on the working plane. It is proposed to use 65w fluorescent light fittings with a rated output of 4300 lumen each. Assuming a maintenance factor of 0.8 and a utilization factor of 0.5. Calculate the number of light fittings required.

(10marks)

- (b) An office 10m long by 3m wide is illuminated with fluorescent lamp to a level of 224 lumen/m². The maintenance factor is 0.8 and the coefficient of utilization is 0.6. Calculate the total power required given a lamp efficiency of 35lumen/watt.

(10marks)

QUESTION TWO

- a) Define the following terminologies as used in network analysis for project implementation
- i) Work Breakdown structure (WBS)
 - ii) Dummy Activity
 - iii) Float
- (8marks)
- b) An Organization undertook a project having activities with costs and duration as shown in table 1 below .using the forward – backward pass method of network analysis construct the network and determine.
- i) The Total cost of the project
 - ii) The Critical Path (to be shown on the network)
 - iii) The duration of the whole project
 - iv) The float for Activities C,G and J

Activity	Period(YRS)	Cost	Event	Activity	Period (YRS)	Cost	Event
A	3	2m	1-2	J	1	1m	5-6
B	4	4m	1-3	K	5	2m	6-9
C	3	6m	1-4	L	2	3m	6-10
D	2	2m	2-5	M	3	4m	10-9
E	3	7.5m	3-6	N	1	3m	8-11
F	0	1m	3-7	O	½	2m	9-11
G	3	2m	4-7	p	½	1m	11-12
H	11/2	3m	7-10				
I	0	1m	5-8				

TABLE 1

(12marks)

QUESTION THREE

- a) State any **three** malpractices which demonstrate Abuse of Tendering procedures **(3marks)**
- b) Explain any **FOUR** factors to be considered when selecting the best possible technical services provider for an organization **(4marks)**
- c)
 - i) State any four site and four office overhead for a Construction organization **(3marks)**
 - ii) Explain each of the **Eight** overheads in C (i) above. **(6marks)**
- d) Explain any **TWO** factors to be considered when making a competitive bidding (tender) **(3marks)**

QUESTION FOUR

- a) State the requirements for a well designed lighting scheme. **(4 marks)**
- b) Draw :-
 - i. A fluorescent lamp circuit, including a p.f. correction capacitor and explain how it works.
 - ii. A well labeled diagram of a metal halide lamp and explain how it works. **(6marks)**
- c) A lamp having a luminous intensity of 720cd is fixed 6M above a working plane. Calculate the illumination.
 - i. At point A vertically bellow the lamp
 - ii. At a point B, 6M from point A on the same horizontal plane. **(10 marks)**

QUESTION FIVE

- (a) State:-
 - (i) Three factors affecting the value of utilization factor **(3marks)**
 - (ii) The disadvantages of single filament in a lamp over the coiled coil filament. **(4marks)**
- (b) State the expected efficiency of the following lamps.
 - (i) Tungsten filament lamp
 - (ii) Tungsten filament lamp with argon gas. **(3marks)**
- (c) define the following terms
 - (i) flicker
 - (ii) glare
 - (iii) maintenance factor
 - (iv) luminous intensity **(4marks)**
- (d) (i) Explain how discharge lamps work.
(ii) Describe a semi indirect lighting **(6marks)**