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 clamps.

(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)**