



MACHAKOS UNIVERSITY COLLEGE

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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND SEMESTER EXAMINATION FOR CERTIFICATE IN ELECTRICAL
INSTALLATION

EPC 218: ELECTRICAL DESIGN ESTIMATING AND TENDERING

DATE: 8/8/2016

TIME: 2:00 – 4:00 pm

INSTRUCTIONS

Answer Question One and Any Other Two Questions

SECTION A: COMPULSORY QUESTION.

1. a) State any three essentials of a valid contract. (3 marks)
- b) i) Define the term contract. (2 marks)
- ii) Outline the procedure of taking –off materials from architectural drawings (7 marks)
- c) Explain the following methods of discharging a contract
 - i) Breach of contract
 - ii) By performance (4 marks)
- (d) Explain the following types of tenders;
 - (i) Negotiated tendering
 - (ii) Competitive tendering (4 marks)

- (e) Two lamps A and B of 200 candela and 400 candela respectively are situated 100m apart. The height of A above the ground level is 10m and that of B is 20m. Calculate the reading of a photometer that is placed at the centre of the line joining the two lamp posts. (6 marks)
- f) Define the following laws as applied in illumination ;
- (i) Inverse square law
- (ii) Cosine law (4 marks)

SECTION B : ATTEMPT ANY TWO QUESTIONS.

2. (a) Define the term 'Estimating' as applied in contracts. (2 marks)
- (b) (i) Explain two secondary functions of an estimate. (4 marks)
- (ii) State any three disadvantages of material listing as a scheduling method of the tendering process. (3 marks)
- (c) Define the following terms with respect to lighting scheme;
- i) Maintenance factor
- ii) Utilization factor. (4 marks)
- (d) A luminaire produces a luminous intensity of 2000 cd in all directions below the horizontal when suspended 5 m above the floor finish level. Calculate ;
- i) The illumination produced at a point P directly below the lamp .
- ii) The illumination at a point Q 30 m away from point P (7 marks)
3. (a) With the aid of a labelled diagram, explain the operation of a sodium discharge Lamp. (8 marks)
- (b) Define the following terms used in lighting circuits
- i) Illumination
- ii) Luminous intensity (4 marks)
- (c) Explain the following remedies entitled to an aggrieved party under the law of contract
- i) Damages
- ii) Injunction (4 marks)

- (d) State four circumstances capable of termination of an offer . (4 marks)
- 4 . (a) With the aid of a labelled diagram, describe the construction and operation of a high pressure mercury vapour lamp . (9 marks)
- (b) Define the following terms with respect to lighting scheme ;
i) Luminous flux
ii) Reflection factor (4 marks)
- (c) State the primary function of an estimate (2 marks)
- (d) Explain the following types of estimates;
i) Lump sum
ii) Bill of quantities (5 marks)
5. (a) A light assembly shop 15m long, 7.5m wide and 3m to trusses, is to be illuminated to a level of 220 lux. The utilization and maintenance factors are respectively 0.54 and 0.8. The lamp efficiency is 13 lumens per watt and space to height ratio is unity . Assuming the use of tungsten lamps with dispersive metallic reflections, make a scale drawing of the plan of the shop and set out the required lighting points. (5 marks)
- (b) State the sequence of estimating process. (5 marks)
- (c) Explain the following types of bills of quantities
i) Trade bills
ii) Elemental bills (4 marks)
- (d) State two functions of the law of torts (2 marks)
- (e) Explain the following general defences used in a case of tort;
i) Act of God
ii) Statutory authority (4 marks)