

2521/303, 2602/301

2601/301, 2603/301

**INDUSTRIAL MANAGEMENT, ESTIMATING,  
TENDERING AND ENGINEERING SERVICES  
CONTRACTS**

**June/July 2023**

**Time: 3 hours**



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING  
(POWER OPTION)  
(TELECOMMUNICATION OPTION)  
(INSTRUMENTATION OPTION)  
MODULE III**

**INDUSTRIAL MANAGEMENT, ESTIMATING, TENDERING AND  
ENGINEERING SERVICES CONTRACTS**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments;*

*Non programmable scientific calculator.*

*This paper consists of EIGHT questions in TWO sections, A and B.*

*Answer TWO questions from Section A and THREE questions from Section B.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are as indicated.*

*Candidates should answer the questions in English.*

**This paper consists of 5 printed pages.**

**Candidates should check the question paper to ascertain that  
all the pages are printed as indicated and that no questions are missing.**

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**Turn over**

## SECTION A: INDUSTRIAL MANAGEMENT

*Answer any TWO questions from this section.*

1. (a) Distinguish between cross elasticity of demand and income elasticity of demand. (4 marks)
- (b) Outline **five** advantages of Management by Objectives (MBO). (5 marks)
- (c) Highlight **five** qualities of an effective purchasing officer. (5 marks)
- (d) Explain **three** merits of an open plan office. (6 marks)
2. (a) Outline **four** functions under Routing Stage of production planning. (4 marks)
- (b) State **four** benefits of performance appraisal to an organization. (4 marks)
- (c) Highlight **four** benefits of method study to an organization. (4 marks)
- (d) Outline **four** differences between attribute Inspection and variable Inspection. (8 marks)
3. (a) Explain each of the following types of costs:
  - (i) Direct material cost;
  - (ii) overhead (4 marks)
- (b) Latex Engineering Company wishes to initiate a preventive maintenance programme in one of its firms. Outline **five** factors taken into consideration when planning to achieve this programme. (5 marks)

- (c) Table 1 shows the activities of a project whose durations are in days.

**Table 1**

Activity	Preceding Activity	Duration Days
A	none	4
B	none	7
C	A	2
D	A,B	10
E	A,B	3
F	C,D	8
G	C,D	3
H	G	7
I	E,F	10
J	H,I	6

- (i) Draw the project network;  
(ii) Determine the:  
(I) Critical path;  
(II) total float for non-critical activities.

(11 marks)

**SECTION B: ESTIMATING, TENDERING AND ENGINEERING SERVICES CONTRACTS**

*Answer any THREE questions from this section.*

4. (a) (i) Explain 'discharge of a contract'.  
(ii) Explain **three** ways of discharging a contract

(8 marks)

- (b) Outline **three** differences between law of guarantee and law of indemnity. (6 marks)

- (c) Explain each of the following terms as used in tendering contract:

- (i) Defects liability period;  
(ii) Liquidated damages;  
(iii) Retention fee.

(6 marks)

5. (a) Explain each of the following terms as used in electrical contracts:
- (i) Lump sum;
  - (ii) Interim payment;
  - (iii) Penalty clause;
  - (iv) Variations. (8 marks)
- (b) State **four** rules that determine consideration of a contract. (4 marks)
- (c) Explain **four** sources of law in Kenya. (8 marks)
6. (a) State **four** types of site overheads. (4 marks)
- (b) (i) Explain negligence as used in law.  
(ii) Explain two elements of negligence. (6 marks)
- (c) (i) Explain 'void contract'.  
(ii) Outline **four** types of void contracts. (6 marks)
- (d) Describe the following types of building contracts:-
- (i) Lump sum;
  - (ii) Contract based on schedule of rates. (4 marks)
7. (a) (i) Explain the term 'Trade discount'.  
(ii) A maisonnette building is to be wired with an electrical installation. The job requires the following materials
- Six rolls of 2.5 mm<sup>2</sup> cable @Ksh 3500 per roll.
  - Four rolls of 1.5 mm<sup>2</sup> cable @ Ksh 2000 per roll
  - 10 m of 4.00 mm<sup>2</sup> cable @ Ksh 150 per meter.
  - 50 conduits gauge 30 @ Ksh 120 per conduit.
  - Complete set of electrical accessories and switch gear @ Ksh 45,000.
- If the labour costs is 30% of the material costs and a cash discount of 10% is given on the materials. Calculate the total cost of the installation. (6 marks)
- (b) Outline **six** roles of a chairperson in a site meeting. (6 marks)
- (c) (i) Define the term law.  
(ii) Distinguish between arbitration and injunction. (5 marks)
- (d) State **three** advantages of serial tendering. (3 marks)

8. (a) State **four** objectives of working drawing as a contract document. (4 marks)

(b) Explain each of the following as used in the law of contract:

(i) Intent;

(ii) Executory contract;

(iii) Express contract.

(6 marks)

(c) Table 2 shows activities in a project of putting up an installation work whose activities are in days

**Table 2**

<b>Activity Description</b>	<b>Duration in Days</b>
Installing conduits	2
Installing sub-main cables	1
Installation main switch gear	4
Installing wiring connections	3
Installing lighting fittings	2
Installing accessories and connections	1
Testing and Commissioning	1

(i) Construct bar-chart for the project;

(ii) Determine the project duration.

(10 marks)

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