THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING AVIONICS (COMMUNICATION AND NAVIGATION OPTION)

INDUSTRIAL ORGANISATION AND MANAGEMENT

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet
Electronic calculator
Mathematical tables

*Answer any **FIVE** of the **EIGHT** questions in this paper.*
All questions carry equal marks.

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.

1. (a) State **three** key activities involved in the "controlling" function of management. (3 marks)

(b) Outline the steps followed by managers in the decision making process. (7 marks)

(c) The scientific management approach by F.W Taylor revolutionized working methods and productivity in industry. It also had some inherent shortcomings. Explain any **five** of such shortcomings. (10 marks)

2. (a) Outline **four** principles of organization as expounded by Henri Fayol. (4 marks)

(b) State **two** advantages and **two** disadvantages of organizational charts. (4 marks)

(c) Differentiate between 'authority' and 'responsibility' as used in management. (4 marks)

(d) Explain **four** factors considered when setting up departments in an organization. (8 marks)

3. (a) (i) State **four** objectives of method study.

(ii) It is common practice for organizations to hire external specialists to undertake work study in their companies. Explain **four** reasons why many workers are uncomfortable with work study exercises carried out by the external work study specialists. (12 marks)

(b) (i) State **four** reasons for including time allowances in work measurement.

(ii) The following data relates to a job that involves manual and machine elements.

average time for manual element ---------- 8 minutes
average time for machine element ---------- 12 minutes
operator's performance rating----------120 minutes
allowances---------- 10%

Determine:

(I) normal time; (8 marks)
(II) standard time.

4. (a) Explain the following terms used in personnel management:

(i) job description;
(ii) job specification. (4 marks)

(b) (i) State **four** external sources of employee recruitment.
(ii) Explain **three** disadvantages of external employee recruitment. (8 marks)

(c) Explain **four** requirements of an effective employee performance appraisal plan. (8 marks)

5. (a) (i) Differentiate between working capital and fixed capital;
(ii) Outline **four** methods used by companies to raise capital. (6 marks)

(b) (i) Outline the steps involved in the budgetary control process;
(ii) Highlight **four** ways in which budgetary control is important to an organization. (7 marks)

(c) (i) Outline the stages of a product life cycle;
(ii) State **two** factors considered when pricing a new product. (7 marks)

6. (a) Explain the following terms as used in project management;

(i) indirect costs;
(ii) cost slope. (4 marks)

(b) Table 1 shows the data of time estimates of a small project in days.

Table 1

Activity	**Optimistic Time (a)**	**Most likely Time (m)**	**Pessimistic Time B**
1 - 2	1	1	7
1 - 3	1	4	7
1 - 4	2	2	8
2 - 5	1	1	1
3 - 5	2	5	14
4 - 6	2	5	8
5 - 6	3	6	15

(i) determine the expected time and variance for each activity;

(ii) draw the network and determine the critical path;

(iii) determine the slack for the non-critical activities;

(iv) determine the probability of completing the project 3 weeks earlier than the expected duration. (16 marks)

7. (a) Highlight **four** symptoms of a poorly planned plant layout. (4 marks)

(b) Describe the following documents used in production planning and control.

(i) instruction sheet;
(ii) route sheet. (6 marks)

(c) Give **four** reasons for holding stock of a raw material manufacturing organization. (4 marks)

(d) The following data relate to a given stock item:

normal usage	1300 units
maximum usage	2000 units
minimum usage	900 units
lead time	15 - 20 days
economic Order Quantity	30,000 units

Determine:

(i) re-order level;
(ii) minimum level;
(iii) maximum level. (6 marks)

8. (a) Outline **four** functions of the inspection department in a manufacturing industry. (4 marks)

(b) A machine that produces 100mm bolts is known to work to a standard deviation of 0.15mm. Random samples of 6 bolts are taken every 20 minutes and the diameter of each bolt is measured . The results for 5 consecutive samples is as given in table 2:

Table 2

Sample No	DIAMETER IN MM FOR 6 BOLTS					
1	100.2	100.1	99.7	100.0	100.2	100.1
2	99.8	99.9	100.3	100.1	99.8	99.8
3	100.2	100.1	99.8	100.1	100.2	99.7
4	100.4	99.8	100.2	99.8	100.2	100.3
5	100.1	100.0	99.8	100.2	100.1	100.1

(i) calculate the sample mean for each sample;

(ii) determine the upper and lower warning and action lines;

(iii) taking $\overline{\overline{X}}$ as 100, plot the control lines and individual sample results on an $\overline{X}$ chart;

(iv) comment on the state of process control from the chart. (16 marks)