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TEVETA

Technical Education Vocational and Entrepreneurship Training Authority

DIPLOMA IN PRODUCTION AND OPERATIONS MANAGEMENT

LEVEL 6 YEAR II EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATIONS

SETTING: NOVEMBER/DECEMBER 2025

SUBJECT: PRODUCTIVITY METHODS

TIME: THREE (3) HOURS **TOTAL MARKS: 100**

PASS MARK: 50

INSTRUCTIONS TO CANDIDATE

1. Write your Examination Number and National Registration Card Number (NRC) on the answer booklet provided. Ensure you append your signature in the Space provided on answer booklet
2. Write the SCRIPT SERIAL NUMBER on the examine register provided and the entry-slip
3. There are Two (2) Sections in this paper. Section A and Section B
   - Section A contains of ten (10) multiple choice questions. Answer all questions
   - Answer Question Two (2) which is compulsory and any other three (3) questions in Section B
4. Each question carries twenty (20) marks
5. Cell phones and Programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAPER UNTIL YOU ARE TOLD TO DO SO

SECTION A: MULTIPLE CHOICE; ATTEMPT ALL QUESTIONS AND EACH QUESTION CARRIES 2 MARKS

QUESTION 1

Write the letter of the correct answer in the answer booklet provided

1.1 Productivity is best defined as _____.

a) The quality of output per unit of input
b) The quantity of output per unit of input
c) The efficiency of a process
d) The effectiveness of a team (2 marks)

1.2 Productivity Improvement aims to _____.

a) Maximize input
b) Minimize output
c) Optimize output per unit of input
d) Increase efficiency (2 marks)

1.3 Production and Productivity differ in that _____.

a) Production refers to actual goods produced while Productivity measures overall organizational performance.
b) Production uses actual inputs and results in actual outputs while productivity is only takes into account theoretical outputs and Inputs.
c) Production focuses on the transformation of input into products or services while productivity focuses on how well input resources were translated into outputs.
d) Both Production and Productivity are the same and both refer to organizational performance. (2 marks)

1.4_____ is an example of partial productivity factor.

a) Labour productivity
b) Organizational productivity
c) Total productivity
d) Multifactor productivity (2 marks)

1.5 Mongo Sugar Company has increased productivity. Which of the scenario would represent increased productivity?

a) Increased output verses reduced input
b) Increased output verses increased input
c) Improved output verses increased input
d) Reduced output verses increased input (2 marks)

1.6 Taonga Pumps Limited has focused on productivity improvement. Which of the following is a reason why organizations focus on productivity improvement?

a) To reduce employee turnover
b) To increase costs
c) To gain a competitive advantage
d) To Increase customer satisfaction (2 marks)

1.7 Nakonde Beans Limited is following the productivity cycle as they implement their productivity strategies. What is the importance of the productivity cycle?

a) This leads to organizational productivity improvement.
b) Guides the organization on steps in the implementation of productivity strategies.
c) Improves organizational productivity planning.
d) Improves on organizational productivity measurement. (2 marks)

1.8 _____ are technological productivity improvement techniques.

a) Robotics and Value engineering
b) Group technology and Computer-aided Design
c) Computer graphics and product reliability improvement
d) Product standardization and Computer-aided Design (2 marks)

1.9 Calculate the Energy Productivity of a plant whose Output is $1000 and given that the energy input factor is $475

a) $ 2.155
b) $/$ 2.115
c) $ 2.015
d) $/$ 2.015 (2 marks)

1.10 The String diagram is a tool that aims to reduce movement distance.

a) TRUE FALSE

(2 marks)

Total (20 marks)

SECTION B: ANSWER QUESTION TWO AND ANY OTHER THREE QUESTIONS

QUESTION 2 (COMPULSORY)

Kembe Engineering has hired an Industrial Engineer to carry out Time Measurements and she collected the following data:

Observed times cycles

elements	1	2	3	4	5	6	7	8	%RATING
A	4.21	4.20	4.20	4.19	4.18	4.19	4.20	4.18	95
B	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	100
C	3.31	3.20	3.31	3.32	3.30	3.30	3.31	3.30	80
D	0.78	0.77	0.76	0.76	0.78	0.78	0.74	0.75	90
E	0.89	0.90	0.90	0.92	0.91	0.92	0.90	0.93	95
F	0.55	0.58	0.55	0.56	0.56	0.56	0.56	0.57	92

a) From the tabulated data calculate the Standard time given that an allowance of 15% is applied to this operation. (12 marks)

b) Explain **Two (2)** reasons for establishing Standard Time for the operation in (a) above. (4 marks)

c) Describe **Two (2)** types of elements that may be encountered while conducting this study. (4 marks)

Total (20 marks)

QUESTION 3

a) Outline **Five (5)** reasons Zambian companies have a challenge in applying or implementing Technological productivity improvement techniques. (5 marks)

b) Describe **Five (5)** Technological productivity improvement techniques. (15 marks)

Total (20 marks)

QUESTION 4

a) Mazabuka Pumps LTD manufactures 30,000 irrigation pumps by employing 50 operators at 8 hours/day for 25 days. The company increased production to 34,000 pumps by hiring an additional 15 operators working for 8 hours/day for 25 days. Calculate the:

i) Labour productivity per man-hour with a labour force of 50 operators. (4 marks)

ii) New labour productivity when the company hired additional labour. (4 marks)

iii) Explain which scenario reflects a higher productivity (8 marks)

b) With the increase in power disruption to Mazabuka Pumps LTD, explain the **four (4)** effects of increased power disruption on production and productivity at Mazabuka Pumps Ltd. (4 marks)

Total (20 marks)

QUESTION 5

a) Explain **Five (5)** importance of productivity measurement in an organization. (10 marks)

b) Explain the following terms in relation to principles of productivity improvement:

i) Global-Market principle (5 marks)

ii) Productivity Gain-sharing Principle (5 marks)

Total (20 marks)

QUESTION 6

a) With regard to Productivity planning differentiate Short term Productivity Planning (SPP) from Long term Productivity Planning (LPP). (8 marks)

b) Describe Ergonomics application to the following

i) Working posture (6 marks)

ii) Tools and Equipment design (6 marks)

Total (20 marks)

QUESTION 7

a) Define "Plant Layout". (2 marks)

b) Explain the application of **Five (5)** material handling principles. (10 marks)

c) With the aid of diagrams describe **Two (2)** plant layouts. (8 marks)

Total (20 marks)