Tutorial Letter 101/3/2018

Work study

MNO2604

Semesters 1 and 2

Department of Operations Management

This tutorial letter contains important information about your module.

BARCODE

Define tomorrow.

UNISA university of south africa

CONTENTS

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Dear Student

1 INTRODUCTION

Welcome to Unisa and, in particular, to **Work Study (MNO2604)**, which is offered by the Department of Operations Management at the University of South Africa. We trust that you will have a stimulating and successful year of study.

Productivity and efficiency are essential in every walk of life. Remember that you have the potential to make a difference, therefore seize the opportunity and make the best of your studies with us. As an adult learner in distance education, you have to take full responsibility for your studies. Your success is up to you.

Your study guide is your primary source of information for this course. The guide consists of **16 study units**, and each has particular learning outcomes. The module covers the following:

- work study
- method study
- work measurement

IMPORTANT

This tutorial letter contains important information for both Semester 1 and Semester 2 students relating to aspects such as assignments, guidelines for studying this module, and contact details of the lecturer. Study this tutorial letter carefully and keep it safe so that you can refer to it throughout the year.

You must submit **two compulsory assignments** per semester, which will determine your year mark. Refer to section 8 for more information and for an explanation of how the assignments will influence your admission to the examination and your final mark for the subject.

This tutorial letter provides information about your lecturer, contact telephone numbers, prescribed textbooks and access to online learning at Unisa. Some of your study material may not be available when you register. Study material that is not available when you register will be posted to you as soon as possible, but it is also available on myUnisa.

2 PURPOSE AND OUTCOMES

2.1 Purpose

The purpose of this module is to ensure that, once you are qualified, you will be able to select and apply a range of intervention techniques and strategies at the operational and tactical levels in organisations and in commerce and industry, resulting in optimising productivity and the quality of work life. A typical role could be that of a work-study practitioner who has been empowered in the field of work study and is able to carry out complete work study investigations and make recommendations for improvements to management.

By studying this module, you will come to identify and acquire the competencies you will need for method study and work measurement, in particular. All the methodologies taught in this module will enable you to carry out a complete work study investigation, suggest ways of improving the method of working, and measure the duration of tasks as a means of improving organisational effectiveness.

Your newly acquired competencies should equip you to find employment in the work study sector and make a constructive contribution to an organisation's objectives. There are four specific outcomes for this module.

2.2 Outcomes

Specific outcome 1

Students should be able to examine work study investigations in the context of increasing the effectiveness of an organisation.

Specific outcome 2

Students should be able to analyse the competencies (qualities, knowledge and skills) that a work study officer needs, considering the multiple relationships involved in conducting a work-study investigation.

Specific outcome 3

Students should be able to develop an improved method using method study techniques and processes by means of a systematic investigation.

Specific outcome 4

Students should be able to develop a standard time for a task/process using work measurement techniques, calculate a standard time for a task/process, and determine the output per hour.

3 LECTURER AND CONTACT DETAILS

3.1 Lecturer availability

The lecturer for this module will be available to take phone calls on academic matters and/or to attend to students who may prefer to visit personally for academic engagement. However, personal visits can only be granted to discuss those academic content-related issues which could not be resolved via e-mail and telephone conversations. The days and times of lecturer's availability will be communicated in the module page on myUnisa. These days and times are subject to change in order to accommodate the lecturer's work schedule and other commitments. The changes on the days and times will be communicated by the lecturer in advance through the announcement option on myUnisa. Students are advised to check the module page on myUnisa before making phone calls or visiting the lecturer's office for academic enquiries/engagements.

Please make an appointment beforehand if you wish to visit a lecturer personally.

The lecturers for this module for 2018 are shown below. It is important to note that this module has two lecturers, each responsible for a specific part of the syllabus. If you have an enquiry, please make sure you contact the lecturer responsible for the relevant part of the module.

My name is Boysana Mbonyane, and I am the lecturer responsible for this module. My contact details are as follows:

☎ Telephone number	+27 12 429 6289 (office hours: 08:00–16:00)
🖷 Fax number	N/A
✉ Postal address	Mr Boysana Mbonyane Department of Operations Management PO Box 392 Unisa 0003
Office address:	Muckleneuk Campus Room 55, 4th floor AJH van der Walt Building
E-mail address	mbonybl@unisa.ac.za
myUnisa webpage	Go to: https://my.unisa.ac.za/portal/

I prefer communicating with students via **e-mail**. However, if you would like to see me in person, please make an appointment in advance. If I am in a consultation and unavailable when you contact me, send me an e-mail or leave a message with another lecturer in the department, and I will contact you as soon as possible.

If you have any question about your study material, please do not wait until the last moment before contacting me. I often receive many desperate calls a day or two before the scheduled examination date, and that really doesn't leave enough time to solve any problems you may have!

3.2 Department

Letters should be sent to the following address:

Mr Boysana Mbonyane
Department of Operations Management
PO Box 392
Unisa
0003

3.3 University

If you need to contact the University about matters not related to the content of this module, consult the brochure, *Study @ Unisa*, which you received with your course material. This brochure contains information on how to contact the University (e.g. to whom you can write with different queries, important telephone and fax numbers, addresses, and details of the times certain facilities are open). Always have your student number at hand when you contact the University.

Use the following contact details for all administrative queries:

Fax number (RSA)	012 429 4150
Fax number (international)	+27 12 429 4150
E-mail	info@unisa.ac.za

4 RESOURCES

4.1 Prescribed books

There is no prescribed textbook for this subject. All the information, which you need to complete your assignments and to prepare for the examination, is available in your study guide. However, you are welcome to consult additional sources.

4.2 Recommended books

The following books are recommended for this subject:

- Barnes, RM. 1980. ***Motion and time study: design and measurement of work.*** Toronto: John Wiley.
- Currie, RM. 1983. ***Work study***. 4th edition. London: Pitman (BIM Publication).
- Freivalds, A. 2009. ***Methods, standards and work design***. 12th edition. Boston: McGraw-Hill.
- Kanawaty, G. 1992. ***Introduction to work study***. 4th edition. Geneva: International Labour Office (ILO).

4.3 Electronic reserves (e-reserves)

There are no e-reserves for this module.

4.4 Library services and resources information

For brief information, go to www.unisa.ac.za/brochures/studies.

For detailed information, go to the Unisa website at http://www.unisa.ac.za/, and click on **Library**.

For research support and the services of personal librarians, go to http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=7102.

The Library has compiled a number of library guides:

- finding recommended reading in the print collection and e-reserves – http://libguides.unisa.ac.za/request/undergrad
- requesting material – http://libguides.unisa.ac.za/request/request
- information on postgraduate information services – http://libguides.unisa.ac.za/request/postgrad
- finding, obtaining and using library resources and tools to assist in doing research – http://libguides.unisa.ac.za/Research_Skills
- contacting the Library/finding us on social media/frequently asked questions – http://libguides.unisa.ac.za/ask

5 STUDENT SUPPORT SERVICES

5.1 myUnisa

As a registered Unisa student, you will have access to the myUnisa electronic portal. From here, you can access various online resources to assist you in your studies. Claim your Unisa login details and set up your myLife e-mail address. Familiarise yourself with the *Study @ Unisa* brochure and other guidelines. You will find it very helpful to browse through some of the student orientation videos available on myUnisa.

Take time to read your **Getting started letter** and learn more about the myUnisa tools that we will use for this module.

Remember, you must be registered on myUnisa to be able to submit assignments online, access the library functions, download study material, chat to your lecturers or fellow students, communicate with the administrative departments at Unisa, participate in online discussion forums and gain access to all kinds of learning resources.

5.2 Contact with fellow students

I encourage you to have contact with fellow students. The myUnisa module site will enable you to communicate with other students and perhaps even get together and form study groups. You can obtain the addresses of students in your area from the following department:

Directorate: Student Administration and Registration
PO Box 392
Unisa
0003

If you have problems or need assistance with your study material or assignments, you can contact fellow students through myUnisa and see if you can get help from any of them. You can also ask me questions on the **Discussion Forums** – for instance, look for the **Assignment** tool and post your question there for me. I may not be able to respond to each question individually, but I will look at your questions and answer them in one general reply to all students.

The syllabus for this module contains information on work study, method study and work measurement.

NOTE

YOU MUST PASS THE ASSIGNMENT AND THE EXAMINATION TO PASS THIS MODULE.

5.3 Predatory Providers of Classes and Examination Support

Please be aware of the existence of multiple fraudulent and predatory providers of classes and examination guidance to Unisa students. Please note that Unisa do not have agreements with any of these agencies/schools/colleges to provide tuition or support to our students. Unisa also do not provide these predators with study material, guidelines or your contact information.
These providers may not have the necessary expertise to assist you and often charge exorbitant fees. If you receive an invitation from any agency or College, it is best to confirm with your lecturer if the provider is a legitimate Unisa partner.

5.4 TVET Agreements

Unisa, however, have agreements with a number of TVET Colleges to provide contact tuition and support for students in the following Higher Certificates:

- Higher Certificate in Economic & Management Sciences
- Higher Certificate in Banking
- Higher Certificate in Tourism
- Higher Certificate in Accounting Sciences

More information on this is available on the Unisa website.

6 STUDY PLAN

Refer to the *Study @ Unisa* brochure for information about general time-management and planning skills.

7 PRACTICAL WORK AND WORK-INTEGRATED LEARNING

No practical work is planned for this module.

8 ASSESSMENT

8.1 Assessment criteria

- Describe the origins and development of work study, and state the definitions of work study, method study and work measurement.

- Acquire a basic knowledge of productivity and of the way in which work study can contribute to increasing productivity.

- Distinguish between the nature, scope and structure of work study.
- Describe the overall view of work study being a useful “tool” to management.
- Summarise the qualities and training that an MS officer should have and his/her relationship with management, the supervisor and workers.
- State the basic procedure and explain why method study is regarded as a systematic investigation.
- Explain what the gathering and recording of information entails, and compile and interpret all process charts.
- Formulate an improved method using method study, and demonstrate how to carry out a simple method study.
- Give a definition of method study, and describe the objectives, nature and scope of method study.
- Distinguish between the basic work measurements techniques.
- Describe the concepts of standard time and rating, define time study, and identify time study equipment.
- Explain how to apply the timing techniques and determine the scope of a study.
- Use statistical formula to determine the number of observations to be made.
- Calculate the basic time, the standard time, and the error margin.
- Discuss the seven factors that are important in activity sampling, and describe the advantages of activity sampling.
- State how to apply the principles of layouts and explain the factors influencing the planning of a layout.
- Discuss in detail the procedures of a verbal report and the procedures of written reports, and outline the aim and purpose of work study reports.
- Distinguish between the different types of work study reports and outline the structure of a work-study report.

8.2 Assessment plan

There are **two compulsory assignments per semester** for this module. The marks that you obtain for these assignments will contribute to your year mark.

You have to submit the **compulsory Assignment 01** to obtain admission to the examination, but both assignments will contribute to your year mark.

Make sure that your assignments reach the University **on or before their due dates**. **If you miss the submission date for Assignment 01, you will not be admitted to the examination!**

Please do not contact lecturers about the submission or late submission of assignments.

Assignments 01 and 02 for MNO2604 are multiple-choice question (MCQ) assignments, and both are compulsory. Assignment 03 is a **self-assessment** assignment, and it includes essay-type questions and calculations. This assignment is **voluntary** (for self-assessment purposes). **Do not submit it for marking.**

Assignment 01 has a dual purpose: You must submit this assignment to be admitted to the examination, and the marks that you obtain for it will contribute to your year mark. You will gain examination admission purely by submitting Assignment 01 **on time** – in other words, examination admission will not be based on the mark that you have obtained for the assignment. If you do not submit this assignment on or before the due date, you will not be admitted to the examination, regardless of whether you have submitted Assignment 02 and obtained a year mark or not. Assignments are seen as part of the learning material for this module. As you are completing the assignments, studying the reading texts, consulting other sources, discussing the work with fellow students or tutors, or doing research, you are actively engaged in learning.

If you want to write to the University to enquire about assignments (e.g. whether the University has received your assignment or not, or at which date the assignment was returned to you), please use the address below:

The Registrar
PO BOX 392
Unisa
0003

You will receive feedback on **both** the assignments in Tutorial Letter MNO2604/201/3/2018. As soon as you receive this tutorial letter, check your answers. The assignments and commentaries form an important part of your learning, and should help you to be prepared better for the examination.

Although you are allowed to work with other students when preparing for assignments, each of you must write and submit his/her own individual assignment. In other words, you must submit your own ideas, expressed in your own words, sometimes including relevant short quotations that are properly referenced.

It is unacceptable for any of you to submit identical assignments based on having worked together with others. That constitutes copying (a form of plagiarism), and none of these assignments will be marked. Furthermore, those of you who do this may be penalised or subjected to disciplinary proceedings by the University.

8.3 Assignment numbers

8.3.1 General assignment numbers

Unisa has adopted a policy of **compulsory assignments** for all modules for 2017. Both multiple-choice question (MCQ) assignments (Assignments 01 and 02) for MNO2604 are compulsory assignments. Assignment 03 is a **self-assessment** assignment, including essay questions and calculations. Note that this assignment is **voluntary** (for self-assessment purposes). **Do not submit it for marking.**

VERY IMPORTANT

Please ensure that your assignments reach us on or before their due dates. You will not be admitted to the examination if you submit **Assignment 01** late. Please **do not phone** us with a request to be admitted to the examination if you did not submit **Assignment 01** or if you submitted it late.

8.3.2 Unique assignment numbers

A different **unique number** is allocated to each of the two assignments. **Make sure that you write the correct unique number on the mark-reading sheet.** You will find the compulsory and self-assessment assignments for 2018 in **section 12 (ADDENDUM)** of this tutorial letter.

8.4 Assignment due dates

FIRST SEMESTER		
Assignment number	**Due date**	**Unique number**
01	2018/03/12	**833635**
02	2018/04/16	**887115**

SECOND SEMESTER		
Assignment number	**Due date**	**Unique number**
01	2018/08/13	**683219**
02	2018/09/10	**881247**

The assignment due dates will not be extended. **Try to submit your assignment a week before the due date.**

8.5 Submission of assignments

You may submit written assignments and assignments done on mark-reading sheets either by post or electronically via myUnisa. You may **not** submit assignments via fax or e-mail. For detailed information on and requirements for assignments, consult the brochure, *Study @ Unisa*.

To submit an assignment via myUnisa:

- Go to myUnisa.
- Log in using your student number and password.
- Select the module.
- Click on **Assignments** in the menu on the left-hand side of the screen.
- Click on the assignment number you wish to submit.
- Follow the instructions.

8.6 The assignments

See section **12 (ADDENDUM)** for the assignments for 2018.

8.7 Other assessment methods

There are no other assessment methods.

8.8 The examination

8.8.1 Examination admission

Completing the assignments to the best of your ability will benefit you as it will help you be better prepared for the examination, and will help you improve your overall mark if you obtain a relatively low examination mark (between 46% and 50%). However, to pass the subject you must obtain a subminimum of 40% in the examination. This means that even if you obtain a high year mark, you will not pass the module if your examination mark is below 40%.

The two assignment marks (percentages) will be added to arrive at an **average percentage mark** (your year mark). Your year mark and examination mark will be combined to arrive at your final mark – in other words, **your final mark for this module will consist of a combination of your year mark (average assignment marks/percentages) and your examination mark**. Your year mark will contribute 20% and your examination mark will contribute 80% to your final mark for this module.

8.8.2 How will it work in practice?

Look at the examples below to see how it will work in practice.

Example 1

You submit both compulsory Assignments 01 and 02 and earn an average year mark of 50%. This year mark of 50% is then multiplied by 0,2 (which equals 10% of the final mark). If you obtain 35 out of 70 marks in the examination (that is, 50%), this percentage is multiplied by 0,8 (which equals 40% of the final mark). The year mark and the examination mark are combined (10% + 40%) to give a final mark of 50% for the module.

Example 2

You submit both compulsory Assignments 01 and 02 and obtain an average year mark of 60%. This year mark multiplied by 0,2 gives 12% of the final mark. You then obtain 44 out of 70 marks (or 63%) in the examination. This figure is multiplied by 0,80 to give 50,4%. The two results are combined to give a final mark of 62% (12% + 50,4%) for the module.

Example 3

You submit both compulsory Assignments 01 and 02 and earn an average year mark of 30%. This year mark of 30% is multiplied by 0,2 (which equals 6% of the final mark). If you obtain 35 out of 70 marks in the examination (that is, 50%), this percentage is multiplied by 0,8 (which equals 40% of the final mark). The year mark and the examination mark are combined (6% + 40%) to give a final mark of 46% for the module. You will therefore **not pass the module, even though you may have passed the examination**. This shows you that your year mark can be critical in determining whether you pass or fail the module!

Example 4

You submit both compulsory Assignments 01 and 02 and earn an average year mark of 100%. This year mark of 100% is multiplied by 0,2 (which equals 20% of the final mark). If you obtain 31 out of 70 marks in the examination (that is, 44%), this percentage is multiplied by 0,8 (which equals 35% of the final mark). The year and the examination mark are combined (20% + 35%) to give a final mark of 55% for the module. You will then pass the module – although you have failed the examination, you did obtain a mark above the subminimum of 40% for the examination. Again, this shows that your year mark can be critical in determining whether you pass or fail the module!

Example 5

You do not submit Assignment 01, although you have obtained a mark of 100% for Assignment 02. Because you did not submit Assignment 01, you **would not be admitted to the examination** and you would thus receive an examination mark of 0%. You will be awarded a final mark of 10% (0% for Assignment 01 + 100% for Assignment 02 = 100 ÷ 2 = 50% x 0,2 = 10% [year mark] + 0% [examination mark] = 10% [final mark]).

Completing the assignments is therefore an excellent opportunity for you to ensure that the work that you are doing throughout the year contributes to your final mark. If you decide not to

use this opportunity to the full, you will be at a definite disadvantage compared to learners who grasp the opportunity with both hands.

8.8.3 Examination period

Although I cannot give you an exact examination date at this stage, the examination period for this module is as follows:

Semester 1: May/June 2018

Semester 2: October/November 2018

8.8.4 Format of the examination paper

The examination will cover the whole syllabus (all study units) for this module. It will be a closed-book examination, and you must therefore know, understand and be able to apply all the work.

The examination paper consists of two sections. It is marked out of **70**.

Section A consists of question 1, which is made up of ten multiple-choice sub-questions. There is no mark-reading sheet; therefore, you will need to answer this question in your answer book. Question 1 is marked out of 10.

Section B consists of three questions, namely questions 2, 3 and 4. Questions 2, 3 and 4 cover both the **theory and the practical side** of this subject. Each of these questions is worth 30 marks. You have to select and answer **any two** questions from section B.

Sections A and B together thus count 70 marks.

To sum up:

SECTION A

QUESTION 1: Answer **all** the sub-questions in this section 10 marks

SECTION B

QUESTIONS 2, 3 and 4: Select and answer **any two** of the three questions 60 marks

Total: 70 marks

The duration of the examination is **two hours**. You will be notified of the exact time and date of the examination later in the year.

- If your final mark is 50% or more, you will have passed **MNO2604**.
- If your final mark is below 50%, and your examination mark is between 40% and 49%, you will have failed and you will have to register for the supplementary examination.
- If your examination mark is below 40%, you will not be allowed to write the supplementary examination and you must re-register in the next registration period.

8.8.5 Previous examination papers

We do not supply previous examination papers to you. However, as a general guideline, you can accept that the type of questions that will be asked in the examination will be similar to the questions asked in the activities in your study guide and in the assignments.

8.8.6 Tutorial letter containing information about the examination

To help you in your preparation for the examination you will receive a tutorial letter that will tell you more about the examination. Consult the brochure, *Study @ Unisa*, for general examination and examination preparation guidelines.

8.8.7 Alternative assessment for students qualifying for final year concessions

The brochure, *Study @ Unisa*, contains important information on the final-year concession procedure to assist students who have one or two modules outstanding. The Department of Examination Administration (DEA) at Unisa will inform all students who qualify for a final year (FI) concession by SMS or e-mail. FI students can choose whether to be referred to the next formal examination opportunity or to engage in an alternative method of assessment.

For this module, the alternative method of assessment is a portfolio. Qualifying students will receive more information about the alternative method of assessment.

Alternative methods of assessment are subject to stringent academic rules and processes, and they should not be considered an easier option. FI students who do not achieve the learning outcomes of the module through the alternative method of assessment will fail, and will need to re-register for the outstanding module.

9 FREQUENTLY ASKED QUESTIONS

There is no information on frequently asked questions.

10 SOURCES CONSULTED

None

11 IN CLOSING

I am confident that this module has the potential to make a significant contribution to both your personal and your professional development. You are welcome to contact me, or the department, if you have any queries of an academic nature.

I wish you a successful and enjoyable year of study!

Yours sincerely

Mr Boysana Mbonyane

Senior Lecturer: Work Study
Department of Operations Management

12 ADDENDUM

Assignments

There are two compulsory assignments **per semester**.

SEMESTER 1

ASSIGNMENT 01
Due date: 12 March 2018

This assignment consists of 20 multiple-choice questions relating to work study and method study. You must answer this assignment on the **mark-reading sheet** provided.

TOTAL: 20 marks

ASSIGNMENT 02
Due date: 16 April 2018

This assignment consists of 20 multiple-choice questions relating to work measurement. You must answer this assignment on the **mark-reading sheet** provided.

TOTAL: 20 marks

SEMESTER 2

ASSIGNMENT 01
Due date: 13 August 2018

This assignment consists of 20 multiple-choice questions relating to work study and method study. You must answer this assignment on the **mark-reading sheet** provided.

TOTAL: 20 marks

ASSIGNMENT 02
Due date: 10 September 2018

This assignment consists of 20 multiple-choice questions relating to work measurement. You must answer this assignment on the **mark-reading sheet** provided.

TOTAL: 20 marks

BOTH SEMESTERS

SELF-ASSESSMENT ASSIGNMENT

DO NOT SUBMIT FOR MARKING

This self-assessment assignment consists of questions relating to method study and work measurement.

TOTAL: 130 marks

SEMESTER 1 **ASSIGNMENT 01: COMPULSORY ASSIGNMENT** **DUE DATE: 12 MARCH 2018** **UNIQUE NUMBER: 833635**
This assignment for module MNO2604 consists of **20** multiple-choice questions relating to work study and method study (study units 1 to 9).

MULTIPLE-CHOICE QUESTIONS

Answer the following 20 multiple-choice questions. Each question is worth 1 mark. No negative marking will be applied.

1. Work study is important to an organisation because it can assist ….

   1 an organisation's management in determining the rates of remuneration of its employees.
   2 suppliers in ensuring that all raw materials are delivered on time.
   3 a manager in achieving results that would make his/her organisation more effective.
   4 employees in working harder in order to meet set targets and due dates.

2. Almost every industry, business and service organisation are restructuring themselves in order to operate more effectively due to ever-increasing competition from all parts of the world. With this in mind, the definition, "the systematic examination of the methods of carrying out activities so as to improve the effective use of resources and to set up standards of performance for the activities being carried out", refers to ….

   1 work study.
   2 motion study.
   3 method study.
   4 time study.

3. There is nothing new about investigations and improvements in the workplace; good managers have been investigating and improving ever since human effort was first organised on a large scale. “The prime value of work study lies in the fact that, by carrying out its systematic procedures, a manager can …."

    1 make sure that all resources are available at the right time and the right place to prevent employees waiting for material.
    2 achieve results as good as or better than the less systematic genius was able to achieve in the past.
    3 monitor all his/her employees to ensure that they are working hard.
    4 ensure that the organisation cares about its employees and rewards them equitably for their endeavours.

4. The steps “select, record, examine, develop, evaluate, define, install, and maintain,” are outlined for which one of the following concepts?

    1 Work study.
    2 Time study.
    3 Method study.
    4 Activity sampling study.

5. The structure of work study comprises two main techniques. If a work-study investigation is conducted in an organisation, these two techniques, if conducted properly, can lead to an improvement in productivity. Which of the following are the two techniques of work study?

    1 Motion study and synthesis
    2 Ergonomics and good housekeeping
    3 Analytical estimating and comparative estimating
    4 Method study and work measurement

6. The objective of work study is to assist management in obtaining optimum utilisation of the human and material resources available to the organisation to accomplish the work that has to be completed. With this in mind, state which of the following are objectives of work study:

   a The most efficient and effective application of the plant and equipment
   b The most efficient and effective application of human resources
   c The evaluation of material usage
   d The estimation of tasks to be carried out

   1 a
   2 ab
   3 abc
   4 abcd

7. The importance of work study as a management aid is being recognised on a larger scale as organisations gear up to become ….

   1 more effective and efficient in their operations.
   2 more profitable with increased revenues.
   3 more streamlined by retrenching employees.
   4 more lean by eliminating unnecessary activities.

8. Work study succeeds because it is systematic. This one simple statement can sum up the nature of work study because systematic investigations take time and in most organisations, it makes sense to separate the task of work study from the management task. Which of the following statements summarises the nature of work study?

   a It is a means to improve the productivity or efficiency of a working environment by re-organising the work. Normally, it requires little or no capital outlay in terms of plant, equipment or tools.

   b It is systematic and therefore, work study ensures that no factor that could influence the efficiency or effectiveness of the work is left out, either while

analysing the original method or process, or when developing new ones. A systematic approach therefore ensures that all relevant information is obtained for analysis.

c It is the most accurate method that has yet been developed for determining work standards and it is essential for efficient and effective planning and control, especially of production.

d It is a "tool" that can be used anywhere, for manual labour or machinery utilisation. It can also be used in workshops, offices, stores, laboratories, industries that supply services, retail companies, restaurants, etc.

1 a
2 ab
3 abc
4 abcd

9. *What do you understand by the term "aids for organisational effectiveness"? What are these aids and how do they help make an organisation more effective?*
The above constitute some of the questions that immediately run through your mind when you see the title, "Aids for effective management". In view of these statements, which of the following are aids that can assist management to become effective?

a Variety reduction.
b Value analysis.
c Motion study.
d Programme evaluation and review technique.

1 a
2 ab
3 abc
4 abcd

10. The definition, “the systematic recording and critical examination of the factors and resources involved in an operation, in order to develop a more efficient method and to reduce costs”, refers to ….

    1 work study.
    2 motion study.
    3 method study.
    4 time study.

11. The steps, select, record, examine, develop, define, install, and maintain, are outlined for which one of the following concepts?

    1 Work sampling study
    2 Work study
    3 Method study
    4 Work measurement

12. One of the objectives of method study is to develop better ways of doing things and reducing costs in the organisation. It contributes to improving efficiency by eliminating unnecessary work and delays and to preventing other forms of waste. Which of the following can be considered objectives of method study?

    a Improved planning and design of factories and offices
    b Improved work procedures, processes and methods
    c Improved utilisation of raw materials, plant and equipment
    d Improved employee happiness in the workplace

    1 a
    2 ab
    3 abc
    4 abcd

13. A work study officer uses process charts during a method study investigation to get as much information as possible in order to improve the methods of working. With this in mind, state in which step of the method study procedure will the work study officer make use of process charts?

    1 Step 2: Record.
    2 Step 3: Examine.
    3 Step 4: Develop.
    4 Step 5: Define.

14. “What is a systematic investigation and how does it relate to method study?” A systematic investigation can be defined as a systematic approach to a problem with the purpose of solving the problem in the most advantageous way possible. It is based on certain principles. State which of the following can be considered principles of a systematic investigation?

    a The purpose of the investigation must be clearly understood and drafted during the preliminary survey and agreed upon before starting the task itself.

    b All relevant information about the problem under investigation must be obtained and recorded. Information is obtained through personal observation, interviews, relevant documentation, etc.

    c The investigation must be carried out according to a plan that was drafted beforehand. The plan must be of such a nature that the work study officer’s time is spent in the best way and that the investigation will not be interrupted, as far as possible. Such a plan should also be flexible.

    d The conclusions and recommendations must not come as a surprise to the staff. This will happen if staff are not involved in the investigation. Always acknowledge the contributions of all staff members.

    1 a
    2 ab
    3 abc
    4 abcd

15. The relationship between method study and systematic investigation procedures is divided into three phases. State which of the following are these phases?

    a Analyses phase
    b Reconnaissance phase
    c Development phase
    d Evaluation phase

    1 abc
    2 bcd
    3 abd
    4 acd

16. During a method study investigation, it is necessary to conduct a preliminary survey (also known as a pilot study) and an analysis of information. This is a limited or small investigation into the problem area. Its purpose is to put the problem into perspective and to determine whether it is worthwhile undertaking the investigation or not. With this in mind, state which of the following can be considered purposes of the preliminary survey:

    a To determine whether the problem had originally been defined correctly, what the causes of the problem are, and what the possible consequences of the problem will be

    b To determine the scope of the problem, that is, any deviation from the original instruction during the investigation could be observed in time so that the final solution covers the whole problem area

    c To determine whether the problem belongs with work study – although work study covers a large area in the organisation, many areas do not fall within the field of work study

    d To determine whether the investigation is justified

1 a
2 ab
3 abc
4 abcd

17. To compile process charts the work study officer utilises process chart symbols. There are six such symbols. Which one of the following symbols denotes a storage?

1 
2 
3 
4 

18. Which one of the following charts uses two symbols only, namely, operation and transport?

1 Flow process chart
2 Outline process chart
3 Multiple activity chart
4 Two-handed process chart

19. The questioning technique employs a specific sequence that is used for both primary and secondary questions. In this technique, the recorded information is critically examined. In view of this, state which one of the following is the correct sequence of the primary questions?

1 Purpose, place, means, sequence and person.
2 Person, purpose, place, means and sequence
3 Means, place, sequence, person and purpose
4 Purpose, place, sequence, person and means.

20. Process charts fall into two distinct categories, namely, charts that indicate a process sequence and charts that indicate a time scale. State which two of the following charts uses a time scale to record actions?

1 Outline process and flow process charts.
2 Flow process and travel charts.
3 Multiple activity chart and simo charts.
4 Two-handed process and outline process charts.

SEMESTER 1: Compulsory Assignment 01: 20 questions x 1 mark = 20 marks

SEMESTER 1

ASSIGNMENT 02: COMPULSORY ASSIGNMENT

DUE DATE: 16 APRIL 2018

UNIQUE NUMBER: 887115

This assignment for module MNO2604 consists of **twenty** multiple-choice questions based on work measurement (study units 10 to 16).

MULTIPLE-CHOICE QUESTIONS

Answer the following twenty (20) multiple-choice questions. Each question is of equal value and is allocated one (1) mark. No negative marking will be applied.

1. "The application of techniques designed to set the time in which a qualified worker must carry out a task at a defined rate of working" refers to the definition of ….

   1 motion study.
   2 work study.
   3 method study.
   4 work measurement.

2. Work measurement looks at investigating, reducing and eliminating ineffective time, that is, time during which no effective work is being carried out. Which of the following explains the value of work measurement for an organisation?

   a It provides management with a technique of measuring the time taken to perform an operation.
   b It is also valuable because it can be used to set standard times for operations.
   c The development of standard times allows management to pick up ineffective times in the work processes.
   d Standard times allow management to calculate rest allowances for operations.

   1 a
   2 ab
   3 abc
   4 abcd

3. The value of work measurement lies in the fact that it can be used to ….

1 determine efficient methods of working.
2 set estimates for specific tasks.
3 eliminate bottlenecks in work processes.
4 provide an organisation with a technique to measure time.

4. The application possibilities of work measurement are countless. Which of the following would you say are application possibilities of work measurement?

a It serves as an important aid to evaluating new or improved methods. By comparing the durations of alternative solutions with one another, the method with the shortest duration may be identified as a possible best solution.

b It can be used to determine present and future requirements for labour, materials, machinery, floor space, personnel, etc.

c It serves as an aid to planning and scheduling work (production).

d It serves as a basis for the control of production and labour.

1 a
2 ab
3 abc
4 abcd

5. Work measurement techniques are divided into two important parts, namely, direct work measurement techniques and indirect work measurement techniques. In response to this statement, indicate which two of the following are direct work measurement techniques?

a Synthesis
b Analytical estimating
c Time study
d Work (activity) sampling

1 ab
2 ac
3 cd
4 bc

6 Similar to the basic procedures of method study, a set of procedures must be followed to achieve success in a work measurement investigation. State which one of the following is the correct procedure of work measurement?

1 Select, record, examine, develop, define, install, and maintain.
2 Select, record, examine, evaluate, develop, define, install, and maintain.
3 Select, record, examine, measure, compile and define.
4 Select, record, examine, analyse, define, install, and maintain.

7. The definition, “a work measurement technique for recording the times of performing a specific job or its elements under specified conditions and for analysing the data to obtain the time that an operator will need to carry it out at a defined rate of performance”, refers to ….

1 time study.
2 method study.
3 motion study.
4 activity sampling study.

8. “The amount of work 'contained in' a given product or process, measured in work hours or machine hours" refers to a definition of ….

1 work cycle.
2 work content.
3 man hours.
4 machine hours.

9. Which one of the following definitions refers to the concept of standard pace (rating)?

1 The total time in which a job should be completed at standard performance.
2 The assessment of the worker's rate of working relative to the observer's concept of the rate corresponding to a standard.
3 The sequence of elements that are required to perform a job or yield a unit of production.
4 A distinct part of a specified job selected for convenience of observation, measurement and analysis.

10. Given the information below, calculate the "basic time" and state which one of the following is the correct answer. Work to three (3) decimal places.

Element number	Observed time	Observed rating	Basic time
1	1,889	85	

1 1.600 centi-minutes
2 1.602 centi-minutes
3 1.604 centi-minutes
4 1.606 centi-minutes

11. Given the information below, calculate the "selected basic time" (SBT) and state which one of the following is the correct answer. Work to three (3) decimal places.

Element number	Observed time	Observed rating	Basic time	Frequency	Selected basic time
1	1,889	85		2/1	

1 3.197 centi-minutes
2 3.199 centi-minutes
3 3.211 centi-minutes
4 3.231 centi-minutes

12. Given the information below, calculate the "actual time" and state which one of the following is the correct answer. Work to three (3) decimal places.

Element number	Observed time	Observed Rating	Basic time	Frequency	Selected basic time	Rest allowance	Actual time
1	1,889	85		2/1		12	

1 3.591 standard minutes
2 3.593 standard minutes
3 3.595 standard minutes
4 3.597 standard minutes.

13. Use the information given below to calculate the “error margin” and state which one of the following is the correct answer:

Clock time	=	30.00 minutes
All observed times	=	27.54 minutes
Time elapsed before study (TEBS)	=	1.11 minutes
Time elapsed after study (TEAS)	=	1.04 minutes

1 1.03%
2 1.05%
3 1.07%
4 1.09%

14. Any work study officer must be able to determine the reliability of a standard time scientifically, especially when standard times are used in incentive schemes. In such cases, a work study officer must use the statistical formula to determine the scope of the study. Consider the example below. A task produced the observed times set out below. Calculate the number of observations and state which of the following is the correct answer.

Element number	1	2	3	4	5
Observed times	4.88	8.77	7.97	5.10	6.00

$$N = 40 \left(\frac{\sqrt{n' \sum x^2 - (\sum x)^2}}{\sum x} \right)^2$$

1 87 cycles

2 89 cycles

3 91 cycles

4 93 cycles

15. The following table shows the observation times and ratings of a time study. It involves two operators employed in the packaging department of an organisation. Their task involves assembling boxes for packaging. You are required to do the following:
    - Calculate the standard time for operator A to pack one box.
    - Calculate the standard time for operator B to pack one box.
    - State which of the following answers are the correct standard times.

Note: Ignore information that has not been provided, for example, frequency, rest allowance (RA) and contingency allowance.

Box number		**Operator A**				**Operator B**		
		Observed time	**Rating**	**Rest allowance**		**Observed time**	**Rating**	**Rest allowance**
1		1,41	80	0		2,11	80	0
2		1,50	75	0		1,96	85	0
3		1,71	70	0		3,41	70	0
4		1,26	85	0		3,36	75	0
5		1,37	80	0		3,44	70	0

1 Operator A = 5.51 basic minutes AND Operator B = 9.56 basic minutes

2 Operator A = 5.62 basic minutes AND Operator B = 10.67 basic minutes

3 Operator A = 6.73 basic minutes AND Operator B = 11.78 basic minutes

4 Operator A = 7.56 basic minutes AND Operator B = 12.26 basic minutes

16. The following table shows the observed times and ratings of an operation involving 10 elements. A contingency allowance of 5% is applicable. Calculate the standard time for this operation and state which one of the following is the correct answer:

Element number	Observed times	Observed rating	Basic time	Frequency	SBT per element	Rest allowance %	Actual time
1	0.66	115		2/1		12	
2	1.65	75		1/1		14	
3	1.62	80		1/1		15	
4	1.86	95		1/1		13	
5	1.21	85		1/1		12	
6	0.54	115		1/1		15	
7	0.76	100		1/1		14	
8	1.68	75		1/1		13	
9	0.52	115		1/1		16	
10	1.94	70		1/1		14	
						Total actual time	
						Contingency allowance (5%)	
						Standard time	

1 13.61 standard minutes

2 13.63 standard minutes

3 13.65 standard minutes

4 13.67 standard minutes

17. The following table shows the observed times and ratings of an operation involving five (5) elements. You are required to calculate the standard time for this operation. A contingency allowance of 5% is applicable. Work to two decimal places and indicate which one of the following is the correct answer:

Element number	Observed time	Observed rating	Frequency	Rest allowance %
1	0.66	105	2/1	12
2	1.65	80	1/1	14
3	1.51	85	2/1	15
4	0.88	75	1/1	13
5	1.21	70	1/1	12

1 8.08 standard minutes

2 9.10 standard minutes

3 10.12 standard minutes

4 11.14 standard minutes

18. The following table shows four (4) elements. Calculate the actual time for each element and state which one of the following is correct. Work to two decimal places.

Element number	**1**	**2**	**3**	**4**
Selected basic time	0.17	0.21	0.35	0.43
Rest allowance %	5	6	7	8
Actual time (in minutes)	**0.180**	**0.239**	**0.379**	**0.466**

1 0.180 standard minutes

2 0.239 standard minutes

3 0.379 standard minutes

4 0.466 standard minutes

19. The following table shows the standard time calculation of a time study. A contingency allowance of 6% is applicable. Work to two decimal places. Calculate the standard time for this operation and state which of the following is the correct answer:

STANDARD TIME CALCULATION							
Element number	**Element description**	**Basic time**	**Frequency**	**SBT per measurement**	**RA %**	**Other allowance**	**Actual time**
1		**0.55**	1/1		15		
2		**0.61**	1/1		14		
3		**0.67**	1/1		16		
4		**0.64**	1/1		14		
5		**0.62**	1/1		15		
SBT = Selected basic time RA = Rest allowance AT = Actual time				**TOTAL ACTUAL TIME**			
				Contingency allowance			
				STANDARD TIME			

1 3.64 standard minutes

2 3.76 standard minutes

3 3.88 standard minutes

4 3.90 standard minutes

20. The following table shows the standard time calculation of a time study. A contingency allowance of 5% is applicable. Work to two decimal places.

Calculate the following:

- the total basic time per element
- the average basic time per element
- the actual time per element
- the standard time for this operation

State which of the following is the correct answer:

BASIC TIME CALCULATION SHEET								
		Element Number						
		NO. 1	**NO. 2**	**NO. 3**	**NO. 4**	**NO. 5**		
NUMBER OF OBSERVATIONS	**1.**	1.18	1.44	0.48	1.02	1.22		
	2.	1.10	1.48	0.39	1.05	1.25		
	3.	1.11	1.49	0.44	0.96	1.24		
	4.	1.25	1.47	0.45	0.98	1.20		
	5.	1.15	1.45	0.47	0.94	1.26		
	6.							
	7.							
	8.							
	9.							
	10.							
TOTAL BASIC TIMES								
NO. OF OBSERVATIONS								
AVERAGE BASIC TIME								
TEBS = TIME ELAPSED BEFORE STUDY TEAS = TIME ELAPSED AFTER STUDY SBT = SELECTED BASIC TIME AT = ACTUAL TIME								

1 4.57 standard minutes
2 4.75 standard minutes
3 5.57 standard minutes
4 5.75 standard minutes

SEMESTER 1: Compulsory Assignment 02: 20 questions x 1 mark = 20 marks

SEMESTER 2

ASSIGNMENT 01: COMPULSORY ASSIGNMENT

DUE DATE: 13 AUGUST 2018

UNIQUE NUMBER: 683219

This assignment for module MNO2604 consists of **twenty** multiple-choice questions based on Work study and Method study (study units 1 to 9).

MULTIPLE-CHOICE QUESTIONS

Answer the following twenty (20) multiple-choice questions. Each question is of equal value and is allocated one (1) mark. No negative marking will be applied.

1. The importance of work study as a management tool is being recognised on a larger scale as organisations are gearing up to become more effective and efficient in their operations. Work study is valuable to an organisation because it ….

   1 is the quantitative relationship between the number of products produced and the number of resources used
   2 assists management in achieving their organisational objectives efficiently
   3 is used to determine standard times for management functions
   4 measures the effective use of suppliers of raw materials

2. Work study is considered an important management tool. Management can always use it to their benefit. Work study assists the management of an organisation to ….

   1 achieve its organisational objectives efficiently.
   2 determine the costs of raw materials from its suppliers.
   3 measure the efficiency of its markets.
   4 report on employees who are late at work.

3. The work study officer is a person who has the necessary training and knowledge to conduct work study investigations. Which one of the following statements justifies the main reason that managers should not conduct work study investigations but should leave it to the work study officer?

    1 The manager understands his/her employees and work processes.
    2 The work study officer is experienced in conducting work study investigations.
    3 The manager is experienced and has the ability to analyse all the operations.
    4 The work study officer has acquired more knowledge and experience than the manager.

4. Work study consists of a systematic procedure. If you want to guarantee the success of any work study investigation, all steps must be followed in the correct sequence. You cannot omit any single step of this procedure. During the second step of the work study procedure, it is necessary to record all the activities of the present method because you ….

    1 may miss certain steps.
    2 feel that it is necessary.
    3 will be able to examine each step critically.
    4 need to define the method of working.

5. The importance of work study lies in the fact that a manager can achieve results by following a systematic procedure. Work study uses a systematic procedure to achieve positive results. Work study succeeds because it is ….

    1 costly but easy to maintain.
    2 labour intensive and effective.
    3 systematic and follows a set procedure.
    4 time consuming but thorough.

6. The relationship between method study and systematic investigation procedures is divided into three phases. State which two of the following are correct?

   a analysis phase
   b project phase
   c development phase
   d evaluation phase

   1 a and b
   2 b and c
   3 b and d
   4 c and d

7. “The systematic examination of the methods of carrying out activities to improve the effective use of resources and to set up standards of performance for the activities being carried out" refers to the definition of ….

   1 value analysis.
   2 work study.
   3 variety reduction.
   4 activity sampling.

8. One cannot over-emphasise the value that work study adds to the management of an organisation. The prime value of work study is that it can be applied in any situation where work is being performed. Management needs work study because it ….

   1 uses continuous observations and studies at the workplace to obtain the information required
   2 uses project management to determine the duration of activities
   3 uses activity sampling to measure the time it takes to produce a product
   4 uses productivity to determine the suppliers of raw materials

9. The work study procedure consists of several steps. It is imperative that all these steps be followed in the correct sequence during a work study investigation. State which one of the following is the third step of the work study procedure:

    1 record
    2 define
    3 evaluate
    4 examine

10. "The systematic recording and critical examination of the factors and resources involved in an operation, in order to develop a more efficient method and to reduce costs," refers to the definition of ….

    1 work study
    2 motion study
    3 method study
    4 Activity sampling study

11. Method study is the first technique of work study. The work study officer always conducts a method study prior to work measurement. The method study considers the method of the work being carried out, with the aim of ….

    1 measuring the method of operation.
    2 ensuring that management understands the correct methods.
    3 determining the duration of work activities.
    4 improving the method of working.

12. Work study comprises two techniques, namely, method study and work measurement. Method study offers a systematic approach to problem solving. Method study is carried out prior to work measurement because ….

    1 method study is more important than work measurement.
    2 you must improve the method of working before setting time standards.
    3 you need to set time standards prior to improving methods.
    4 work measurement is more important than method study.

13. Method study tries to solve problems and it is constantly identifying problems in the workplace to determine their cause and what can be done not only to solve them but also to avoid them in future. Method study is carried out with the purpose of ….

1 developing a time standard.
2 determining rest allowances.
3 calculating productivity levels.
4 developing an easier method of working.

14. In order to compile process charts, the work study officer utilises process chart symbols. There are six such symbols. Which one of the following symbols denotes transport?

1 

2 

3 

4 

15. One of the objectives of method study is to develop better ways of doing things and reducing costs in the organisation. It also contributes to improving efficiency by eliminating unnecessary work and delays, and preventing other forms of waste. Which of the following can be considered objectives of method study?

a improved planning and design of factories and offices
b improved work procedures, processes and methods
c improved utilisation of raw materials, plant and equipment
d improved employee rating of work performance

1 a
2 ab
3 abc
4 abcd

16. Which one of the following steps of the method study procedure utilises the questioning technique?

1 Select
2 Record
3 Examine
4 Develop

17. Step 5 of the method study procedure concerns “defining” the new method. Each alternative must be defined in detail prior to submitting them to management for approval. Which one of the following explains why it is necessary to define the new method that has been developed?

1 To have it recorded
2 To have it maintained
3 To have it examined
4 To have it implemented

18. A method study consists of many charts, on which the work study officer can record information during a work study investigation. Each chart has its own unique purpose. Which one of the following charts uses a time scale?

1 Flow process chart.
2 Multiple activity chart.
3 Outline process chart.
4 Two handed process chart.

19. Not all process charts uses all the process chart symbols. Which one of the following charts uses all of the process chart symbols?

1 Multiple activity chart
2 Simo chart
3 Outline process chart
4 Flow process chart

20. The questioning technique is used in step 3 of the method study procedure. Here the recorded information is critically examined. In view of this, state which of the following relates to a specific order that is used for both primary and secondary questions?

a. purpose
b. place
c. sequence
d. conditions

1 a
2 ab
3 abc
4 abcd

SEMESTER 2: Compulsory Assignment 01: 20 questions x 1 mark = 20 marks

SEMESTER 2 **ASSIGNMENT 02: COMPULSORY ASSIGNMENT** **DUE DATE: 10 September 2018** **UNIQUE NUMBER: 881247**
This assignment for module MNO2604 consists of **twenty** multiple-choice questions based on Work measurement (Unit 10 to Unit 16).

MULTIPLE-CHOICE QUESTIONS

Answer the following twenty (20) multiple-choice questions. Each question is of equal value and is allocated one (1) mark. No negative marking will be applied.

1. Which one of the following refers to the definition of work measurement?

    1 A distinct part of a specified job selected for convenience of observation, measurement and analysis

    2 The amount of work contained in a given product or process, measured in work hours or machine hours

    3 A work measurement technique for recording the times of performing a specific job or its elements under specified conditions and for analysing the data to obtain the time that an operator will need to carry it out at a defined rate of performance

    4 The application of techniques designed to set the time in which a qualified worker must carry out a task at a defined rate of working

2. The application possibilities of work measurement are countless. Which of the following would you say are application possibilities of work measurement?

a It is an important aid to compiling budgets.
b It serves as a basis for a realistic and fair wage incentive system.
c It can be used to determine the scope of peaks and slumps in, for example, the output of a factory.
d It is used to determine standard times.

1 a
2 ab
3 abc
4 abcd

3. Which one of the following implies a worker who has the necessary physical characteristics, knowledge, training and skills to do the specific task?

1 A casual worker
2 A qualified worker
3 A contract worker
4 An educated worker

4. Which of the following would you say are some of the ways in which a work study officer can gain the co-operation of workers and supervisors?

a Explain to them, step by step, how you will proceed with the work measurement investigation.
b Make the supervisors and workers feel that they are participating in the investigation.
c Inform everybody of the purpose of the investigation.
d Explain to them that you are interested in the work being done and not in the worker.

1 a
2 ab
3 abc
4 abcd

5. Revisit the basic procedure of method study and compare it with that of work measurement. State which of the following steps of the work measurement procedure do not feature in the method study procedure?

1 Select and record.
2 Measure and compile.
3 Examine and develop.
4 Implement and maintain.

6. Which one of the following refers to “a stated rule, model or criteria against which comparisons can be made; therefore, a kind of pre-determined norm”?

1 Standard
2 Frequency
3 Work cycle
4 Work content

7. Work measurement techniques are divided into two important parts, namely, direct work measurement techniques and indirect work measurement techniques. In response to this statement, indicate which two of the following are indirect work measurement techniques:

a Synthesis.
b Analytical estimating.
c Time study.
d Work (activity) sampling.

1 ab
2 ac
3 cd
4 bc

8. Time study is a direct work measurement technique. It is one of the most commonly used techniques to determine the duration of tasks. In response to this statement, indicate which one of the following is the definition of time study:

   1 the systematic recording and critical examination of the factors and resources involved in an operation in order to develop a more efficient method and to reduce costs.

   2 the total time in which a job should be completed at standard performance, that is, work content, contingency allowance for delay, unoccupied time and interference allowance, where applicable

   3 a work measurement technique for recording the times of performing a specific job or its elements under specified conditions and for analysing the data to obtain the time that an operator will need to carry it out at a defined rate of performance

   4 the application of techniques designed to establish the time in which a qualified worker must carry out a task at a defined rate of working

9. A standard time is not only the time needed to complete basic work content, but it is also the time providing for circumstances not under the control of workers and management. State which of the following are requirements that a standard time must meet:

   a It must be reasonable to the worker.
   b It must be reasonable to management.
   c It must be realistic and achievable.
   d It must include ineffective time due to shortcomings of management and the worker.

1 a

2 ab

3 abc

4 abcd

10. The following table shows task A, which consists of five cycles. The job was measured and the basic times of the variable elements with the greatest degree of variance are shown below. Use the statistical formula to calculate the number of cycles and state which one is the correct answer.

TASK A						
	1	**2**	**3**	**4**	**5**	**Total**
x	2.68	2.45	3.66	4.55	3.12	**$\sum x$ =**
x^2						**$\sum x^2$ =**

1 84 cycles

2 86 cycles

3 88 cycles

4 90 cycles

11. *Error margin:* Use the information given below to calculate the error margin and state which one of the following is the correct answer:

Clock time	=	60.00 minutes
All observed times	=	57.21 minutes
Time elapsed before study (TEBS)	=	1.22 minutes
Time elapsed after study (TEAS)	=	0.72 minutes

1 1.34%

2 1.38%

3 1.42%

4 1.46%

12. *Time study:* Use the information below to calculate the standard time for element 1, and state which one of the following is the correct answer. Work to three (3) decimal places.

Element number	**1**
Selected basic time	2.498
Rest allowance %	12%
Contingency allowance	**5%**

1 2.930 standard minutes
2 2.938 standard minutes
3 2.942 standard minutes
4 2.950 standard minutes

13. *Time study:* The following shows the observed time and rating of element 1. Use the information below to calculate the actual time, and state which one of the following is the correct answer:

Element number	**Observed time**	**Rating**	**Basic time**	**Frequency**	**Selected basic time**	**Rest allowance**	**Actual time**
01	2.584	65		1/2		11	

1 0.84 standard minutes
2 0.87 standard minutes
3 0.90 standard minutes
4 0.93 standard minutes

14. The following table shows the observed times and ratings of an operation involving five (5) elements. A contingency allowance of 6% is applicable. Calculate the standard time for this operation, and state which one of the following is the correct answer:

Element number	Observed time (min)	Observed rating	Rest allowance %
1	1.56	85	14
2	2.42	90	12
3	5.48	80	13
4	3.66	75	15
5	4.34	105	14

1 17.20 standard minutes

2 18.30 standard minutes

3 19.40 standard minutes

4 20.50 standard minutes

15. The following table shows the observation times and ratings of a time study. It involves two tasks. A contingency allowance of 6% is applicable. You are required to do the following:

- Calculate the standard time for task A.
- Calculate the standard time for task B.
- State which of the answers given below are the correct standard times.

Note: Ignore information that has not been provided, for example, frequency and rest allowance.

		TASK A			TASK B	
Element number		**Observed time**	**Rating**		**Observed time**	**Rating**
1		1.28	95		2.84	70
2		1.66	70		2.65	85
3		1.38	80		2.18	100
4		1.02	100		2.98	80
5		0.98	110		1.91	105

1 Operator A = 5.73 standard minutes AND Operator B = 11.28 standard minutes

2 Operator A = 5.79 standard minutes AND Operator B = 11.34 standard minutes

3 Operator A = 5.85 standard minutes AND Operator B = 11.40 standard minutes

4 Operator A = 5.91 standard minutes AND Operator B = 11.46 standard minutes

16. *Conversion – minutes and seconds to centi-minutes*:

The following durations were observed using a stopwatch that records in seconds. Convert these observed times to centi-minutes, and then state which one of the following is the correct answer:

Observed times (minutes and seconds)	**Converted times** (centi-minutes)
0 minute, 90 seconds	
2 minutes, 45 seconds	
3 minutes, 55 seconds	
4 minutes, 35 seconds	

1 1.33 centi-minutes

2 2.75 centi-minutes

3 3.70 centi-minutes

4 4.75 centi-minutes

17. The observed time of element A is 2.98 minutes and it has a rating of 85%. Calculate the “basic time”, and state which one of the following is the correct answer:

1 2.513 centi-minutes

2 2.523 centi-minutes

3 2.533 centi-minutes

4 2.543 centi-minutes

18. The following table shows the observed times and ratings of an operation involving seven (7) elements. A contingency allowance of 5% is applicable. Calculate the standard time for this operation, and state which one of the following is the correct answer:

Element Number	Observed times	Observed rating	Basic Time	Frequency	SBT per element	Rest allowance %	Actual time
1	0.38	105		1/1		13	
2	1.06	85		1/1		14	
3	0.66	80		1/1		13	
4	0.58	75		1/1		15	
5	1.27	80		1/1		12	
6	2.04	100		3/1		10	
7	2.30	95		2/1		12	
						Total actual time	
						Contingency allowance (5%)	
						Standard time	

1 12.12 standard minutes

2 13.14 standard minutes

3 15.14 standard minutes

4 16.12 standard minutes

19. The following table shows the standard time calculation of a time study. A contingency allowance of 6% is applicable. Work to two decimal places. Calculate the standard time for this operation, and state which of the following is the correct answer:

STANDARD TIME CALCULATION							
Element number	**Element description**	**Basic time**	**Frequency**	**SBT per measurement**	**RA %**	**Other allowance**	**Actual time**
1		**0.36**	1/1		13		
2		**1.12**	1/1		14		
3		**0.63**	1/1		13		
4		**0.58**	1/1		15		
5		**1.22**	1/1		12		
6		**2.30**	3/1		10		
7		**2.26**	2/1		12		
SBT = Selected basic time RA = Rest allowance AT = Allowed time				**TOTAL ACTUAL TIME**			
				Contingency allowance			
				STANDARD TIME			

1 15.04 standard minutes

2 16.06 standard minutes

3 17.08 standard minutes

4 18.10 standard minutes

20. The official working hours of a certain department are from 08:00 to 16:00. The staff are allowed two tea breaks of 15 minutes each and a lunch break of 45 minutes daily. The department works a five-day week. A contingency allowance of 30 minutes per day is allowed. Calculate the total effective working time per week, and state which of the following is the correct answer:

1 1980 minutes per week
2 1995 minutes per week
3 2010 minutes per week
4 2025 minutes per week

SEMESTER 2: Compulsory Assignment 02: 20 questions x 1 mark = 20 marks

SELF-ASSESSMENT ASSIGNMENT

FOR BOTH SEMESTERS

DO NOT SUBMIT FOR MARKING.

QUESTION 1

Questions 1.1 and 1.2 relate to work study.
Questions 1.3 and 1.4 relate to method study.

1.1 Write brief notes on your understanding of the term "work study", and explain how work study can add value to an organisation. (4)

1.2 For a work study investigation to be carried out, a specific procedure must be followed. Explain the steps of the work study procedure. (7)

1.3 Explain your understanding of the method study technique, and state why method study is always conducted prior to work measurement. (4)

1.4 Process chart symbols are used in the compilation of process charts during a method study investigation. Read the following descriptive statements, and name and draw the symbols for each.

(5)

Description	Name of symbol	Symbol
Finished goods stored in		
Documents waiting to be filed		
Checking if machine is switched off		
Washing bottles before filling them		
Walking to storage area		

1.5 **Process charting:** Flow process chart

The following process concerns the packaging of canned vegetables at Fresh Food (Pty) Limited. The process starts with the operator fetching empty cans from storage. The process ends with the operator positioning the packed box of cans onto a pallet to be transported to the warehouse. Compile a flow process chart.

The procedure of the flow of work being carried out is as follows:

> The operator fetches cans from storage. He opens a carton of cans and inspects their quality. He picks up and positions cans into the machine. He switches on the machine. The cans travel on the conveyer belt to point (1). Here, the cans are filled with vegetables. The cans then travel to point (2). The inspector checks if the cans are filled. The cans travel to point (3). Here, lids are fitted onto the cans. The cans then travels to point (4). Here, the cans are sealed. The cans then travel to point (5).
>
> Here, a label is attached to the cans. The cans finally travel to the end point, where the inspector checks the quality of the cans. The operator then packs the cans into a box. The operator seals the box. He/She places the sealed box onto a pallet.

Required

1.5.1 Compile a flow process chart for the above procedure. Make use of the attached flow process chart to answer this question. (10)

1.5.2 Compile an outline process chart for the procedure used in 1.5.1. Make use of the attached outline process chart to answer this question. (10)

[40]

QUESTION 2

Questions 2.1, 2.2, 2.3 and 2.4 relate to work measurement.

2.1 Work measurement is the application of techniques designed to set the time in which a qualified worker must carry out a task at a defined rate of working. In view of this statement, explain how a work measurement investigation will add value to your organisation. (5)

2.2 To conduct a work measurement investigation a specific procedure must be followed. Examine the basic work measurement procedure, and write brief notes on your understanding of the work measurement technique. (5)

2.3 Work measurement is concerned with investigating, reducing and subsequently eliminating inefficient time. With this in mind, distinguish between direct and indirect work measurement techniques. (6)

2.4 **Time study**

The following shows the observed times and ratings of an operation that was carried out at your organisation. The operation consists of 14 elements. A contingency allowance of 6% is applicable.

TEAS = 0.83 and TEBS = 0.33.

You are required to calculate the standard time for this operation. (14)

Element number	Observed time	Rating	Basic time	Frequency	Selected basic time	Rest allowance (%)	Actual Time
1	0,66	100		2/1		14	
2	1,62	70		1/1		16	
3	1,42	75		1/1		15	
4	0,77	95		1/1		13	
5	1,08	85		1/1		14	
6	0,33	115		1/1		16	
7	0,69	105		1/1		15	
8	1,55	70		1/1		13	
9	0,44	110		1/1		15	
10	1,91	60		1/1		12	
11	0,29	115		1/1		15	
12	0,83	95		1/1		14	
13	1,12	85		1/1		11	
14	1,13	85		2/1		13	
						Total allowed time	
						Contingency allowance	
						Standard time	

[30]

QUESTION 3

NOTE:
Questions 3.1 and 3.2 relate to method study.
Questions 3.3 and 3.4 relate to work measurement.

3.1 **Process charting:** Outline process chart
The following procedure involves a motor vehicle mechanic preparing to start work.

Chart begins: The mechanic drives to the storeroom.
Chart ends: The mechanic drives to the work site.

Mechanic
The mechanic drives to the storeroom (distance of 110 metres).
Gets out of car (0.75 minutes).
Unlocks and enters the storeroom (time 0.50 minutes).
Picks up the toolbox (time 0.25 minutes).
Checks all the tools (4.50 minutes).
Puts aside all unwanted tools (1.75 minutes).
Inserts selected tools into toolbox (1.25 minutes).
Locks the storeroom (time 0.50 minutes).
Gets into car (0.75 minutes).
The mechanic drives to the work site (distance 250 metres).

Required
Using the above information, compile an outline process chart (**operator type**) of the present method of the procedure outlined below. Use the attached outline process chart. (10)

3.2 **Process charting:** Flow Process chart
The following procedure concerns the processing of a home loan application.

The home loan consultant

- Receives the application form from the applicant.
- Checks the application to ensure that all sections are completed (4.3 minutes).
- Places the application form in the outgoing mail tray to be forwarded to the processing department (0.25 minutes).

The credit clerk

- Receives the application the following day.
- Contacts the credit bureau to verify the applicant's credibility (6.90 minutes).
- Checks the applicant's banking details and historical data (8.80 minutes).
- Contacts the employer to verify that the applicant is employed (3.00 minutes).
- Writes a recommendation on the application form (2.50 minutes).
- Takes the application form to the home loan consultant (15 metres).

- Returns to his/her desk.

The home loan consultant

- Receives the application from the credit clerk.
- Checks the recommendation of the credit clerk (1.50 minutes).
- Contacts the applicant to inform him/her of the outcome (3.75 minutes).

Required

Using the above information, compile a flow process chart (**operator type**) of the present method of the procedure. Use the attached flow process chart. (10)

3.3 The following observed times were taken from a time study that was conducted in the production department of your organisation. The task consists of five elements, and five observations of each element were made. The study started at 08:30 and finished at 09:10. A contingency allowance of 6% is applicable.

TEAS = 2.00 minutes TEBS = 1.35 minutes

Element number	Observed time	Rating
1	1.40	80
2	2.35	65
3	0.64	75
4	1.30	80
5	1.58	80
1	1.42	85
2	2.26	70
3	0.56	70
4	1.20	85
5	1.56	85
1	1.40	85
2	2.28	70
3	0.62	75
4	1.32	75
5	1.60	80
1	1.42	85
2	2.32	70
3	0.67	80
4	1.26	80
5	1.48	85
1	1.33	80
2	2.44	65
3	0.68	80
4	1.34	70
5	1.60	85

The following rest allowances are applicable:

Element 1	12%
Element 2	11%
Element 3	12%
Element 4	10%
Element 5	13%

Calculate the following:

3.3.1 the error margin {2}
3.3.2 the basic time to per element {4}
3.3.3 the standard time {4}
(10)

Your calculations must be completed on the attached time-study sheets (see Annexures A and B).

3.4 The information below concerns the manufacturing of one-litre plastic containers. A total of five plastic containers were manufactured. Only one operator was utilised during this process, and the process consisted of five elements.

Element number		Observation number				
		1	2	3	4	5
1	Rating	60	70	75	80	85
	Observed time	3.82	3.41	3.38	3.28	3.79
2	Rating	85	70	75	60	80
	Observed time	3.80	3.55	3.25	3.50	3.96
3	Rating	70	75	65	80	60
	Observed time	2.28	2.54	2.39	2.69	2.85
4	Rating	80	75	70	85	80
	Observed time	3.65	3.60	3.78	3.68	3.82
5	Rating	100	95	100	90	95
	Observed time	1.21	1.12	1.23	1.25	1.22

The following rest allowances are applicable:

Element 1	14%
Element 2	15%
Element 3	10%
Element 4	12%
Element 5	10%

A contingency allowance of 6% is applicable.

As the work study officer, you are required to calculate the following:

3.4.1 the selected basic time per element {5}
3.4.2 the standard time of manufacturing one plastic container {10}
(15)

3.5 Below is a time-study sheet of an operation that was conducted at your organisation. It involves the sewing of towels, and consists of five (5) elements. A total of eight (8) observations were made. The observed times and ratings of the operation, as well as occasional elements, are provided.

The study started at 10:00 and finished at 11:10.

TEAS = 0.73 and TEBS = 0.79

(15)

Required
Calculate the standard time for the sewing of one towel. A contingency allowance of 6% is applicable.

Note: Ignore occasional elements.

TIME STUDY OBSERVATION SHEET			
STUDY NO.: 134/2014	**DATE:** 28 February 2014		
TAKEN BY: JM MICHAELS	**SHEET NO.:** 03	**OF:** 6	
STUDY COMMENCES:	**Start time:** 10:00	**Finish:** 11:10	
STUDY ENDS:			
DESCRIPTION OF TASK: Sewing towels		**Error margin:**	

ELEMENT DESCRIPTION	Observed time	Rating	Basic time	ELEMENT DESCRIPTION	Observed time	Rating	Basic time
Spoke to supervisor: Jabu				**Temperature: Hot and humid**			
1· Pick up towel	1·34	80		1·	1·25	75	
2· Fold & insert in m/c	2·39	65		2·	2·38	70	
3· Run m/c: Sew towel	0·62	75		3·	0·61	70	
4· Remove from m/c	1·26	80		4·	1·19	85	
5· Aside for inspection	1·54	80		5·	1·59	70	
				Operator: Rest break	**4·56**		
1·	1·40	85		1·	1·31	80	
2·	2·29	70		2·	2·31	75	
3·	0·59	70		3·	0·60	75	
4·	1·19	85		4·	1·27	85	
5·	1·49	85		5·	1·56	80	
Ineffective time	**0·83**						
				1·	1·38	85	
1·	1·39	85		2·	2·32	70	
2·	2·33	70		3·	0·66	70	
3·	0·61	75		4·	1·25	80	
4·	1·29	75		5·	1·49	75	
5·	1·58	75		**Waiting for needle**	**1·56**		
				1·	1·40	85	
1·	1·42	85		2·	2·29	70	
2·	2·39	70		3·	0·59	70	
3·	0·69	80		4·	1·19	85	
Idle time	**0·35**			5·	1·49	85	
4·	1·24	80		Operator cooperated			
5·	1·44	75		well with me·			
				Raw materials were			
				delivered on time·			

[60]
TOTAL = 130 MARKS

FLOW PROCESS CHART

LOCATION:

ACTIVITY/AKTIWITEIT**:**

DATE/DATUM:

OPERATOR/ OPERATEUR:

ANALYST/ONTLEDER:

CIRCLE APPROPRIATE METHOD AND TYPE:
OMKRING TOEPASLIKE METODE EN TIPE:

METHOD: PRESENT: PROPOSED:
METODE: TANS: VOORGESTEL:

TYPE: WORKER: **MATERIAL:** MACHINE:
TIPE : WERKER: **MATERIAAL:** MASJIEN:

REMARKS/OPMERKINGS:

SUMMARY

EVENT/GEBEURTENIS	**PRESENT/ TANS**	**PROPOSED/ VOORGESTEL**	**SAVINGS/ BESPARING**
OPERATION/PROSES			
TRANSPORT/VERVOER			
DELAY/OPONTHOUD			
STORAGE/BERGING			
INSPECTION/INSPEKSIE			
TIME/TYD (min.)			
DISTANCE/ AFSTAND (metres/meter)			

STEP NO./ STAPNR	**DESCRIPTION/BESKRYWING**	**SYMBOL/SIMBOOL**					**TIME/TYD (in min)**	**DISTANCE/ AFSTAND (in metres/ meter)**	**REMARKS/ OPMERKINGS**
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			

OUTLINE PROCESS CHART				
DEPARTMENT: DEPARTEMENT:			STUDY NO.: STUDIENR:	DATE: DATUM:
DIVISION: AFDELING:			TAKEN BY: GENEEM DEUR:	
SHEET OF VEL VAN			CHART COMMENCES AT: KAART BEGIN BY:	
PRESENT METHOD: HUIDIGE METODE:		PROPOSED METHOD: VOORGESTELDE METODE:	CHART ENDS AT: KAART EINDIG BY:	
DESCRIPTION OF TASK: BESKRYWING VAN TAAK:				

WORKER: MATERIAL: EQUIPMENT
WERKER: MATERIAAL: TOERUSTING

STEP NO.	DESCRIPTION	SYMBOL	TIME	REMARKS

SUMMARY	○ OPERATION BEWERKING	□ INSPECTION INSPEKSIE		TOTAL STEPS/ TOTALE AANTAL STAPPE
	GETAL: NO.: TYD: TIME:	GETAL: NO.: TYD: TIME:		

FLOW PROCESS CHART

LOCATION:

ACTIVITY/AKTIWITEIT**:**

DATE/DATUM:

OPERATOR/ OPERATEUR:

ANALYST/ONTLEDER:

CIRCLE APPROPRIATE METHOD AND TYPE:
OMKRING TOEPASLIKE METODE EN TIPE:

METHOD: PRESENT: PROPOSED:
METODE: TANS: VOORGESTEL:

TYPE: WORKER: **MATERIAL:** MACHINE:
TIPE : WERKER: **MATERIAAL:** MASJIEN:

REMARKS/OPMERKINGS:

SUMMARY

EVENT/GEBEURTENIS	**PRESENT/ TANS**	**PROPOSED/ VOORGESTEL**	**SAVINGS/ BESPARING**
OPERATION/PROSES			
TRANSPORT/VERVOER			
DELAY/OPONTHOUD			
STORAGE/BERGING			
INSPECTION/INSPEKSIE			
TIME/TYD (min.)			
DISTANCE/ AFSTAND (metres/meter)			

STEP NO./ STAPNR	**DESCRIPTION/BESKRYWING**	**SYMBOL/SIMBOOL**					**TIME/TYD (in min)**	**DISTANCE/ AFSTAND (in metres/ meter)**	**REMARKS/ OPMERKINGS**
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			
		○	□	D	⇨	▽			

ANNEXURE A

TIME-STUDY ANALYSIS SHEET

DEPARTMENT:		**STUDY TAKEN BY:**	
DIVISION:		**DATE:**	**STUDY NO.:**
DESCRIPTION OF TASK:		**TIME FINISHED:**	**TEBS + TEAS:**
		TIME STARTED:	**TIME OF STUDY:**
WORKER:	**ERROR:**	**ELAPSED TIME:**	**RECORDED TIME:**

		Basic time per element E L E M E N T N U M B E R							
		NO. 1	**NO. 2**	**NO. 3**	**NO. 4**	**NO. 5**	**NO. 6**	**NO. 7**	**NO. 8**
NUMBER OF OBSERVATIONS	**01**								
	02								
	03								
	04								
	05								
	06								
	07								
	08								
	09								
	10								
	11								
	12								
	13								
	14								
	15								
TOTALS									
NO. OF OBSERVATIONS									
AVERAGE BASIC TIME									

TEBS = TIME ELAPSED BEFORE STUDY
SBT = SELECTED BASIC TIME
TEAS = TIME ELAPSED AFTER STUDY
AT = ACTUAL TIME

TIME-STUDY SUMMARY SHEET

DEPARTMENT:		**STUDY NUMBER:**	**SHEET NO.** **OF:**
DIVISION:		**NAME:**	**DATE:**
DESCRIPTION OF TASK:		**PERSON STUDIED:**	
	ERROR MARGIN:	**TEBS:**	**TEAS:**

STANDARD TIME CALCULATION

Elem No.	Element description	Basic time	Frequency	SBT per measurement	RA %	Other allowances	Actual time

	TOTAL ACTUAL TIME	
SBT – Selected basic time RA – Rest allowances AT – Allowed time	Contingency allowance	
	STANDARD TIME	