Tutorial Letter 201/2/2017

WORK STUDY

MNO2604

Semester 2

Department of Operations Management

This tutorial letter contains important information
about your module.

BARCODE

Define tomorrow.

UNISA | university of south africa

CONTENTS

Page

1.   INTRODUCTION

Dear student,

Your academic year is rapidly coming to a close. If you have submitted your assignments, your examination lies ahead. I appeal to you to start studying very hard. Both academic institutions and learners regard examinations as an important assessment tool. Our aim is to give you the opportunity to demonstrate to yourself and the examiner that you have acquired knowledge, which you can use to enhance yourself.

Work purposely each day so that the examination becomes a challenge and not punishment. Let us work together and face this challenge together.

Success with your studies.

2.   EXAMINATION VENUES, DATES AND TIMES

Please note that the venues, dates and times of the examinations will be forwarded to you, ensure that you do receive your examination permit. Please contact examinations if you do not receive this.

3.   FORMAT OF THE EXAMINATIONS

Please note the format of the examination paper. This examination paper consists of **two** sections.

SECTION A: This section consists of 1 question which has a total of 10 marks. **Question 1** consists of 10 multiple-choice questions: x 1 mark each. **Please note that you <u>do not</u> need a Mark Reading sheet to answer this question.** Please answer this question in your answer book.
SECTION B: This section consists of three questions, namely, **Question 2, 3 and 4.** This section consists of both essay type questions, process charting and calculations. **You have to select any <u>two</u> questions and answer them for 60 marks out of 70.**

Therefore:

SECTION A:
Question 1: ALL STUDENTS **MUST** ANSWER THIS SECTION = 10 Marks

SECTION B:
Questions 2, 3 and 4: SELECT **ANY TWO** (2) OF THESE THREE (3) QUESTIONS = 60 Marks

TOTAL: = **70 marks**

Make sure that the following information appears on the cover of your answer book:

- Your student number,

- The module code **(MNO2604)**

4. FOLLOW-UP ON ASSIGNMENTS

Read these comments carefully, as it outlines areas in which students normally have a problem. *Please note that your examination paper will consist of only ten (10) multiple choice questions and the balance is made up of essay type questions, process charting and calculations.*

Theory:
- Do not write word-for-word from your study guides.

- Read the questions at least twice before answering.

- Look at the mark scheme and answer accordingly, often learners write too much information or too little information.

- If the question asks you to discuss, you should not outline or list your answer. You will be penalised if you do.

- Minor calculation errors. Ensure that you double-check your answers prior to submission. This also applies to your examination papers.

- Space your work out – there is sufficient space available in your answer sheet.

Process charting:
- Make use of the charts that are supplied to answer the process charting questions.

- Ensure that you number each step, and also number your symbols.

- Do not forget to join each symbol – learners lose marks for this.

- Note that only two symbols feature in the outline process chart, (Inspection and operation)

- Complete the information at the top of the process charts.

- Complete the summary of events of the chart.

4

5.   MEMORANDUM FOR ASSIGNMENTS 1 AND 2 (Semester 2 only)

MEMORANDUM FOR ASSIGNMENT 01:
COMPULSORY ASSIGNMENT
(Semester 2 only)

This assignment for consists of **20** multiple-choice questions relating to
work study and method 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 defined as the _____ investigation 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.

Answer:	**2**
systematic	

2.   The aim of method study is to _____ the job and develop more economical methods of doing it.

Answer:	**4**
simplify	

3.   The "questioning technique" consists of a set sequence, namely, purpose, place, sequence, person and …?

Answer:	**1**
means	

4.   The "define" step of the work study procedure is necessary because you need to.…

Answer:	**4**
present to all in writing	

5.   The secondary questions of the questioning technique seeks alternative questions to problems. Which one of the following is the alternative question for the description "Sequence"?

Answer:	**3**
When else could it be done?	

6.   It is important under the nature of work study to discuss the contribution of work study to the effective functioning of an organisation. Which of the following would you say are important contributions of work study?

Answer:	**4**
a, b, c and d	

5

7. Work study is an aid of management which is based on various techniques, but particularly on
   and …………

Answer:	**2**
method study and work measurement.	

8. Which one of the following is the first step of the method study procedure?

Answer:	**1**
Select	

9. Which one of the following techniques refers to a 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?

Answer:	**3**
Method study.	

10. The main purpose of conducting method study is to ...

Answer:	**4**
improve the method of working.	

11. Which one of the following statements clearly justifies why method study should be carried out before work measurement?

Answer:	**2**
You must improve the method of working before setting time standards.	

12. Method study uses process charts to record activities. Which one of the following charts uses a common time scale?

Answer:	**3**
Multiple activity chart	

13. A process which was considered very efficient ten year ago may not necessarily be the best process today. Which of the following reason/s can increase the efficiency of a process?

Answer:	**4**
a, b, c and d	

14. When selecting the task or process which has to be studied, there are certain factors which the work study officer should bear in mind that will determine the desirability of the examination. State which of the following is/are these factors?

Answer:	**3**
a, b and c	

15. Process charting requires information to be recorded, regardless of the method used. Which of the following are approaches to recording information?

Answer:	3
a, b and c	

16. In order to become a good work study officer, he/she should have knowledge of which of the following?

Answer:	4
a, b, c and d	

17. Over and above work study training, which of the following characteristics should work study officers have?

Answer:	4
a, b, c and d	

18 Which one of the following process chart symbols indicates the movement of workers, materials and equipment from one place to another.

Answer:	4
Transport	

19. "A chart in which the activities of more than one subject (worker machine, item or equipment) are each recorded on a common time scale to show their inter-relationship" refers to the definition of a…

Answer:	2
multiple activity chart.	

20. The flow process chart is basically an extension of the outline process chart. Which of the following are the three types of flow process charts which can be distinguished?

Answer:	3
a, b and c	

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

> **MEMORANDUM FOR ASSIGNMENT 02:**
> **COMPULSORY ASSIGNMENT**
> **(Semester 2 only)**

> This assignment for consists of **20** multiple-choice questions relating to
> work study and method study (units 10 to 16).

MULTIPLE-CHOICE QUESTIONS

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

1. The definition of work measurement refers to establishing the time for a   worker to carry out a task at a defined rate of working.

Answer:	**3**
qualified	

2. Which one of the following refers to "observed time multiplied by rating divided by standard rating?

Answer:	**2**
A basic time	

3. Work measurement consists of direct and indirect techniques. Which two of the following are direct work measurement techniques?

Answer:	**3**
a and c	

4. The value of work measurement lies in the fact that it can provide management with a technique for measuring the time taken to perform an operation so as to improve the effective use of time. Work measurement looks at investigating and reducing and   time.

Answer:	**3**
ineffective	

5. The application possibilities of work measurement are countless. Which of the following can be considered as application possibilities of work measurement?

Answer:	**4**
a, b, c and d	

6. Work measurement is one of the most effective tools available to management, and, when used in conjunction with method study, it is an excellent weapon when starting an attack on inefficiency in any organisation. The scope of work measurement expands the application possibilities to include which of the following?

Answer:	**4**
a, b, c and d	

7. Any unsatisfactory situation or deviation from the standard time is usually discovered by the foreman, supervisor, worker or wages department. In practice there is a tendency immediately to attribute deviations to an inaccurate standard. Deviations can, however, be caused by many factors. Which of the following are the most important factor/s:

Answer:	4
a, b, c and d	

8. Which one of the following techniques uses a stop-watch to determine the duration of a specific task or process?

Answer:	4
Time study	

9. Which one of the following techniques refers to "finding the percentage occurrence of an activity or process"?

Answer:	3
Work/activity sampling	

10. The following table shows job A which comprises five elements. Use the statistical formula to calculate the number of cycles and state which one of the following answers is correct?

Element number	1	2	3	4	5	Total
Observed Times ($\sum x$)	5.99	9.88	8.01	6.12	7.00	37.00
$\sum x^2$	35.88	97.61	64.16	37.45	49.00	284.11

TASK 1

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

$$= \left[\frac{40 \sqrt{5 (284.11) - (37)^2}}{37} \right]^2$$

$$= \left[\frac{40 \sqrt{1420.55 - 1369}}{37} \right]^2$$

$$= \left[\frac{40 \sqrt{51.55}}{37} \right]^2$$

$$= \left[\frac{40 \times 7.18}{37} \right]^2$$

$$= \left[\frac{287.20}{37} \right]^2$$

$$= 7.76^2$$

$$= \underline{\textbf{60 cycles}}$$

Answer: 4
60 cycles

---

11.   Basic time calculation:

Calculate the basic time of the two elements below and state which of the following are the correct answers?

Formula for Basic time   =   Observed time x rating divided by standard rating (100)

Element number	Observed time	Rating	Basic time
1	1.98	110	**2.178**
2	2.67	65	**1.736**

Answer: 2
2.178 and 1.736 minutes

---

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

Error margin = $\dfrac{\text{Clock time} - \text{Sum of all stop watch times}}{\text{Clock time}} \times \dfrac{100}{1}$

= $\dfrac{60 \text{ minutes} - 57.02 + 1.06 + 1.12 \text{ minutes}}{60 \text{ minutes}} \times \dfrac{100}{1}$

= $\dfrac{60 \text{ minutes} - 59.2 \text{ minutes}}{60 \text{ minutes}} \times \dfrac{100}{1}$

= 1.33 %

Answer:	4
1.33 minutes.	

13. 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.

Formula for Basic time = Observed time x rating divided by standard rating (100)
Formula for Selected Basic time = Basic Time x ½
Actual time = Selected basic time + Rest Allowance

Element number	Observed time	Rating	Basic time	Frequency	Selected basic time	Rest allowance	Actual time
01	3.369	95	**3.20055**	1/2	**1.600275**	11	**1.1776**

Answer:	1
1.776 standard minutes.	

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

Element number	Observed time	Observed rating	Basic time	Frequency	Selected Basic time	Rest Allowance	Actual Time
1	0.99	100	**0.99**	2	**1.98**	10	**2.18**
2	1.16	95	**1.10**	1	**2.20**	11	**1.22**
3	2.01	65	**1.31**	1	**11.10**	09	**1.43**
4	0.86	105	**0.90**	1	**0.90**	11	**1.00**
5	0.59	110	**0.65**	1	**0.65**	08	**0.70**
6	0.67	110	**0.74**	1	**0.74**	12	**0.83**
7	1.55	85	**1.32**	1	**1.32**	11	**1.47**
8	1.96	70	**1.37**	1	**1.37**	10	**1.51**
9	1.26	90	**1.13**	1	**1.13**	09	**1.23**
10	2.22	60	**1.33**	1	**1.33**	08	**1.44**
						Total Actual time	**13.00**
						Contingency Allowance (5%)	0.65
						Standard time	**13.65**

Answer:	1
13.65	

15. The information below concerns the assembly of wooded pallets. A total of five wooden pallets were assembled. Only one operator was utilised during this process and the process consisted of five elements. Calculate the standard time to assemble one wooden pallet and state which of the following is the correct answer?

Element number		Observation number				
		1	2	3	4	5
	Rating	60	70	75	80	85
	Observed time	3.06	3.04	3.07	3.05	3.02
	Basic time	**1.84**	**2.13**	**2.30**	**2.44**	**2.57**
	Rating	85	70	75	60	80
	Observed time	2.80	3.55	3.25	4.50	2.96
	Basic time	**2.38**	**2.49**	**2.44**	**2.70**	**2.37**
	Rating	100	100	100	100	100
	Observed time	2.26	2.50	2.31	2.49	2.55
	Basic time	**2.26**	**2.50**	**2.31**	**2.49**	**2.55**
	Rating	100	100	100	100	100
	Observed time	3.95	4.00	3.77	3.66	3.81
	Basic time	**3.95**	**4.00**	**3.77**	**3.66**	**3.81**
	Rating	100	95	100	90	95
	Observed time	1.01	1.10	1.03	1.15	1.11
	Basic time	**1.01**	**1.05**	**1.03**	**1.04**	**1.05**

At the completion of calculating the basic time, add all basic times from the above table in order to acquire total basic time. The total basic times for each element are indicated below:

Total Basic time	Number of observations	Standard times
11.28	5	2.26
12.38	5	2.48
12.11	5	2.42
19.19	5	3.84
5.18	5	1.04
	Standard Time	**12.03**

Answer:	2
12.03	

16. The following table shows four elements. Calculate the actual time for each element and state which one of the following is the correct actual time?

Element number	1	2	3	4
Selected basic time	2.02	2.12	2.25	2.33
Rest allowance %	8	9	10	11
Actual time (in	**2.18**	**2.31**	**2.48**	**2.69**

The correct answer is 2.02 x 1.08 = **2.18**
Point 2 should be 2.12 x 1.09 = **2.31**
Point 2 should be 2.25 x 1.10 = **2.48**
Point 2 should be 2.33 x 1.11 = **2.69 (should be 2.59)**

Answer:	4
2.59	

17. Given the information below, calculate the selected basic time and state which one of the following is the correct answer.

Formula for Basic time   = Observed time x rating divided by standard rating (100)
Formula for Selected Basic time = Basic Time x 2/1

Element Number	Observed time	Observed rating	Basic time	Frequency	Selected basic time
1	6.39	85	5.43	2/1	10.86

Answer: 3
10.86 minutes.

18. The following concerns the remuneration paid to an employee at your organisation. The employee works an eight hour day five days a week. On Saturday and Sunday the employee worked overtime. The company's overtime pay rate is structured as follows:

Saturday: Time and a third
Sunday: Double time
The employee is remunerated at a rate of R8,75 per hour. The total working time of this employee is as follows:

Monday to Friday: 08:00 to 16:00
Saturday: 07:30 to 16:00
Sunday: 07:30 to 12:30

Using the information above, calculate the total remuneration (in rands, per week) of this employee and state which one of the following is the correct answer?

Answer: 2
R536.64

19. The following table shows the observed times and ratings of an operation involving 5 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.

				STANDARD TIME CALCULATION			
Elem No.	Element Description	Basic Time	Frequency	SBT per measurement	RA %	Other Allowances	**Actual Time**
1		**1.55**	1/1	**1.55**	11		**1.72**
2		**1.89**	1/1	**1.89**	12		**2.12**
3		**2.06**	1/1	**2.06**	09		**2.25**
4		**0.96**	1/1	**0.96**	13		**1.08**
5		**1.33**	1/1	**1.33**	12		**1.49**
				TOTAL ACTUAL TIME:			**8.66**
				Contingency allowance: 5%			0.43
				STANDARD TIME:			**9.09**

Answer: 3
9.09 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?

| Answer: 4 |
| 2025 minutes per week |

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

Please go over the assignments in this tutorial letter. Also, ensure that you contact your lecturer if you require any other information. Always try and keep in constant contact with your lecturer.

I trust that you enjoyed studying this Work Study module.

I hope that you find these guidelines helpful. Please prepare well. Remember that I am here if you have any queries with this subject.

Kind Regards,

Mr Boysana Mbonyane

Senior Lecturer: Work Study

Telephone: (012) 429 6289 or

e-mail: *mbonybl@unisa.ac.za*