FINAL %	

UNISA university of south africa

MNO2604

OCTOBER/NOVEMBER 2016

WORK STUDY

STUDENT NUMBER										

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Question No	Marks Examiners 1		2		3	
1						
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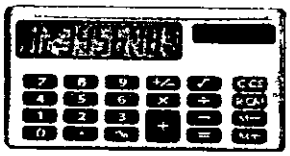

UNIVERSITEITSEKSAMENS

UNISA university of south africa

MNO2604

October/November 2016

WORK STUDY

Duration 2 Hours

70 Marks

EXAMINERS

FIRST DR B SOOKDEO
SECOND MR BL MBONYANE MR MJ MOTHA

Use of a non-programmable pocket calculator is permissible

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue

This examination paper consists of eighteen (18) pages

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

- your student number
- your identification number
- date of examination and examination venue

This examination paper consists of two sections
Section A consists of question 1 which contains ten multiple-choice questions Please answer this question in the block provided in your answer book

Section B consists of three questions, namely questions 2, 3 and 4 Each of these questions is worth 30 marks **You have to select any <u>two</u> questions** and answer them for 60 marks out of 70 Sections A and B together thus count 70 marks

SECTION A:
QUESTION 1 ANSWER ALL THIS QUESTIONS IN THIS SECTION 10 marks

SECTION B:
QUESTIONS 2, 3 and 4 SELECT **<u>ANY TWO</u>** (2) OF THE THREE (3) QUESTIONS <u>60 marks</u>
<u>70 marks</u>

RECOMMENDATION: PLEASE CAREFULLY CONSIDER THE ABOVE MARK ALLOCATION AND TOTAL TIME LIMITATION (TWO HOURS) BEFORE DECIDING ON WHICH SECTION TO ANSWER FIRST.

[TURN OVER]

SECTION A

THIS QUESTION MUST BE ANSWERED BY ALL STUDENTS. ANSWER EACH OF THESE QUESTIONS IN THE BLOCK PROVIDED. ANSWER ALL TEN QUESTIONS

QUESTION 1

1 1 Almost every industry, business and service organisation is restructuring itself in order to operate more effectively In the context of this module, this is primarily due to

1 continuous retrenchments in organisations
2 ever-increasing competition from all parts of the world
3 attaining set targets and quality improvements
4 high levels of remuneration of the labour force

Answer:

1 2 Work study is important to an organisation because it can assist

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

Answer:

1 3 Method study is the first technique of work study and is followed by work measurement Method study concentrates on

1 measuring the time that it takes to carry out a task
2 using direct and indirect work techniques in order to improve work
3 developing more efficient methods of working
4 Improving the efficiency of an organisation by setting standards for all tasks

Answer

1 4 Work study officers fulfil an important task in an organisation and should therefore possess certain qualities Which of the following qualities should a work study officer possess?

a An analytical and constructive mind, which is interested in problems and the isolation and solution of these problems, the ability to express their ideas clearly
Inquisitiveness, perceptivity, sound judgement and a lot of common sense
c Firmness and controlled enthusiasm, the ability to carry on regardless of problems, to study detail without losing interest and to be prepared to wait long for results
d More tact than the average person, a sense of humour, powers of persuasion and social acceptance

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

Answer

15 Process charts fall into two distinct categories Charts which are used to record a "process sequence" and charts which are used to "record actions" Which of the following charts indicates a "process sequence"?

a Outline process chart
b Flow process chart
c Two-handed process chart
d Procedure process chart

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

Answer

16 The value of work measurement lies in the fact that it can provide the management of an organisation with

1 improved methods of working
2 a technique for measuring the time taken to perform an operation
3 a measurement of all activities in order to determine its strategic goals
4 a list of all tasks that are to be completed by employees

Answer.

17 The total time in which a task should be completed at standard performance refers to

1 productivity improvement
2 standard rating
3 standard time
4 performance measurement

Answer

1 8 The total actual time of an element is given as 11 97 minutes A contingency allowance of 6% is applicable Calculate the contingency allowance and state which one of the following is the correct answer?

1 0 716
2 0 717
3 0 718
4 0 719

Answer·

1 9 The information provided below refers to Element 1 You are required to calculate the "Actual time" and state which one of the following is the correct answer?

Observed time = 7 77 minutes
Observed rating = 110
Frequency = 1/2
Rest allowance = 12%

1 4 785
2 4 786
3 4 787
4 4 788

Answer:

1 10 Use the information given below to calculate the "Error margin" and state which one of the following is the correct answers?

Clock time	=	45 00 minutes
All observed times	=	42 96 minutes
Time elapsed before study (TEBS)	=	1 02 minutes
Time elapsed after study (TEAS)	=	0 59 minutes

1 0 96%
2 0 97%
3 0 98%
4 0 99%

Answer

Section A: 10 questions x 1 mark = 10 marks

SECTION B

QUESTIONS 2, 3 AND 4:
SELECT AND ANSWER ANY TWO (2) OF THE THREE (3) QUESTIONS BELOW.
EACH QUESTION COUNTS 30 MARKS.

QUESTION 2

2 1. Explain your understanding of the technique "method study" and describe the objectives of method study (7)

2 2. The method study procedure consists of seven steps Explain the sixth step of the method study procedure and state why this step takes longer than all the other steps to complete (5)

2 3. Method study consists of six process chart symbols You are required to draw and name each symbol Thereafter you are required to provide a description of each symbol (6)

Illustration of symbol	Name of symbol	Description of symbol

2 4 **Method study.** Flow process chart

The following process describes the procedure of the compilation of assignments at a University The assignments are compiled by the lecturer and handed to the Scheduling department to expedite The procedure of the flow of work being carried out is as follows

Description of task:	Compilation of assignments at a University
Chart begins:	The lecturer compiles the assignment
Chart ends:	Tutorial letter is ready for printing

The lecturer compiles the assignment The assignment is then forwarded to the editing department for editing The assignment is edited and then returned to the lecturer The lecturer makes the necessary amendments to the assignment

The lecturer inserts the assignment into the tutorial letter The lecturer then sends the tutorial letter to a colleague for peer review The tutorial letter is returned to the lecturer The lecturer completes a final check of the assignment

The lecturer then takes the folder to the head of department for signature The tutorial letter is signed by the head of department Finally, the lecturer sends the tutorial letter to the Scheduling department

Required:

Read the information provided and compile a flow process chart (material type) of the above procedure for compiling assignments Use the flow process chart on the next page (12)

FLOW PROCESS CHART

LOCATION:	
ACTIVITY / AKTIWITEIT	
DATE / DATUM	
OPERATOR/ OPERATEUR	ANALYST/ONTLEDER
CIRCLE APPROPRIATE METHOD AND TYPE: OMKRING TOEPASLIKE METODE EN TIPE: METHOD METODE — PRESENT TANS — PROPOSED VOORGESTEL TYPE TIPE — WORKER WERKER — **MATERIAL MATERIAAL** — MACHINE MASJIEN	
REMARKS/OPMERKINGS:	

SUMMARY			
EVENT / GEBEURTENIS	PRESENT/ TANS	PROPOSED/ VOORGESTEL	SAVINGS/ BESPARING
OPERATION/PROSES			
TRANSPORT/VERVOER			
DELAY/OPONTHOUD			
STORAGE/OPBERGING			
INSPECTION/INSPEKSIE			
TIME/TYD (mins)			
DISTANCE/ AFSTAND (metres/meter)			

STEP NO	DESCRIPTION OF ELEMENTS	SYMBOL/SIMBOOL	TIME/TYD (in min)	DISTANCE/ AFSTAND (in metres)	REMARKS
		○ □ D ⇨ ▽			
		○ □ D ⇨ ▽			
		○ □ D ⇨ ▽			
		○ □ D ⇨ ▽			
		○ □ D ⇨ ▽			
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		○ □ D ⇨ ▽			

[30]

QUESTION 3

3 1 Work measurement is the second technique of work study and must be conducted after method study Write short notes on your understanding of the term "work measurement" and describe how work measurement serves as an accurate aid for controlling work performance (8)

3 2. Describe what is meant by the term "time study" and explain why it is considered as one of the most accurate direct work measurement techniques (4)

3 3 In any organisation, we find that the output of workers differ from person to person, even though the same methods are used to produce the same output Explain the method that is used by the work study officer to identify an average worker (4)

3 4 **Work measurement:** Time study

The following table shows the observation times and ratings of a time study that was conducted at your workplace It concerns two tasks, A and B Management have requested that you calculate the standard time for Task A and task B separately No contingency allowance is applicable

Please use the tables below to complete this question

Element number		Task A				Task B		
		Observed time	Rating	Rest allowance		Observed time	Rating	Rest allowance
1		**2 55**	85	11		**3.40**	85	12
2		**2.87**	70	12		**3.29**	80	11
3		**2.71**	80	11		**3 56**	70	13
4		**2.49**	90	13		**3.18**	95	14
5		**2.19**	100	12		**3.47**	75	11
6		**2 99**	65	10		**3 88**	65	12

Calculate the following:

3 4 1 The standard time for Task A {7}

Element number	Observed time	Rating	Basic time	Frequency	Selected basic time	Rest allowance	Actual time
1	2 55	85		1/1		11	
2	2 87	70		1/1		12	
3	2 71	80		1/1		11	
4	2 49	90		1/1		13	
5	2 19	100		1/1		12	
6	2 99	65		1/1		10	
						Total actual time	
						Contingency allowance 0%	
						Standard time:	

3 4 2 The standard time for Task B {7}

Element number	Observed time	Rating	Basic time	Frequency	Selected basic time	Rest allowance	Actual time
1	3 40	85		1/1		12	
2	3 29	80		1/1		11	
3	3 56	70		1/1		13	
4	3 18	95		1/1		14	
5	3 47	75		1/1		11	
6	3 88	65		1/1		12	
						Total actual time	
						Contingency allowance 0%	
						Standard time	

(14)

[30]

QUESTION 4

4 1 A work study officer must sometimes use the statistical formula to determine the scope of a work measurement study Make use of statistical formula to determine whether enough observations have been made The task consists of six (6) cycles The job was measured and the basic times of the variable elements with the greatest degree of variance were

	1	2	3	4	5	6	
x	1 02	1 56	1 89	1 98	2 02	2 13	

Show all steps of the calculations (6)

4 2 **Method study.**

This question concerns the compilation of a two-handed process chart

The elements listed below relate to the assembly of two washers, a nut and a bolt To assemble the bolt, nut and washers, the bolt will have to be held in one hand while the washers and nut are assembled with the other This whole process is listed in the table below

Activities of the LEFT HAND	**Activities of the RIGHT HAND**
Reach for bolt	Reach for first washer
Pick up bolt	Pick up washer
Place in position	Place in position
Hold	Assemble on bolt
Reach for container	Reach for second washer
Place in container	Pick up washer
Reach for bolt	Place in position
	Assemble on bolt
	Reach for nut
	Pick up nut
	Place in position
	Assemble on bolt
	Delay
	Reach for first washer

Required:

Use the above information to prepare a present method, two-handed process chart of the assembly process Use the attached two-handed process chart on the next page to answer this question (10)

TWO-HANDED PROCESS CHART

DEPARTEMENT DEPARTMENT		STUDIE NR STUDY NO	DATUM DATE
KAART BEGIN BY CHART COMMENCES AT		GENEEM DEUR TAKEN BY	
KAART EINDIG BY CHART ENDS AT		WERKER WORKER	
HUIDIGE METODE PRESENT METHOD	VEL SHEET	VAN FROM	

BESKRYWING VAN TAAK
DESCRIPTION OF TASK :

LINKERHAND / LEFT HAND	OPERATION	TRANSPORT	STORAGE	DELAY	OPERATION	TRANSPORT	STORAGE	DELAY	REGTERHAND / RIGHT HAND
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	
	○	⇨	▽	D	○	⇨	▽	D	

OPSOMMING / SUMMARY:	▽ STORAGE OPBERGING	○ OPERATION BEWERKING	⇨ TRANSPORT VERVOER	D DELAY VERTRAGINGS	**TOTALE STAPPE/ TOTAL STEPS**
Left hand / Linkerhand					
Right hand / Regterhand					

[TURN OVER]

4 3 **Work measurement:** Time study

The information below concerns the manufacturing of staplers A total of five staplers were manufactured Only one operator was utilised during this process and the process consisted of five elements A contingency allowance of 6% is applicable As the work study officer, you are requested to use the information provided in order to calculate the following

Element number		Observation number				
		1	2	3	4	5
1.	Rating	60	70	75	80	85
	Observed time	2,80	2,41	2,35	2,25	2,19
2.	Rating	85	70	75	60	80
	Observed time	2,80	3,55	3,25	4,50	2,96
3.	Rating	70	75	65	80	60
	Observed time	2,26	2,50	2,31	2,49	2,55
4.	Rating	80	75	70	85	80
	Observed time	3,95	4,00	3,77	3,66	3,81
5.	Rating	100	95	100	90	95
	Observed time	1,01	1,10	1,03	1,15	1,11

4 3 1 Calculate the selected basic time per element {5}

Element number	1	2	3	4	5	Selected basic time per element
1.	60	70	75	80	85	
	2 80	2 41	2 35	2 25	2 19	
2.	85	70	75	60	80	
	2 80	3 55	3 25	4 50	2 96	
3.	70	75	65	80	60	
	2 26	2 50	2 31	2 49	2 55	
4.	80	75	70	85	80	
	3 95	4 00	3 77	3 66	3 81	
5.	100	95	100	90	95	
	1 01	1 10	1 03	1 15	1 11	

4 3 2 The standard time for manufacturing one stapler {9}

Element number	Total Basic Time	Frequency	Selected Basic Time (Average)	Rest Allowance	Actual time
				Total actual time:	
				Contingency Allowance (6%)	
				Standard Time:	

(14)

[30]

Section B: any 2 questions x 30 marks = 60 marks

TOTAL NUMBER OF MARKS (SECTIONS A & B) = 70

ADDITIONAL PAGES.

Should you find that the space provided after each question is insufficient, please number the question and continue with your answers on the following pages