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APPENDIX A

Consent Form

I understand that

* The purpose of this study is to investigate the conceptual understanding and confidence levels of physics first entering students at the university.

* Any personal information about me that is collected during the study will be held in the strictest confidence and will not form part of my permanent record at the university.

* I am not waiving any human or legal rights by agreeing to participate in this study.

* My participation in this study is voluntary.

I verify, by signing below, that I have read and understood the conditions listed above.

Signature: _____

Date: _____

Adapted from Witt-Rose, D.L. (2003)

APPENDIX B

PHYSICS TEST INSTRUMENT

Surname and Name(s): _____

Student Number: _____

University: _____

Name of School (Grade 12): _____

PLEASE NOTE:

The results of this test are very important to inform lecturers about misconceptions and lack of understanding in physics. The results will be used for research purposes and also to track your progress during this year. Please work as accurately as possible and give your honest response. The results will, however, not count towards your semester or final marks for physics.

Thank you for your cooperation!

APPENDIX B

PHYSICS TEST INSTRUMENT

Surname and Name(s): _____

Student Number: _____

University: _____

Name of School (Grade 12): _____

PLEASE NOTE:

The results of this test are very important to inform lecturers about misconceptions and lack of understanding in physics. The results will be used for research purposes and also to track your progress during this year. Please work as accurately as possible and give your honest response. The results will, however, not count towards your semester or final marks for physics.

Thank you for your cooperation!

INSTRUCTIONS

- Fill the top section of this booklet and the top of the pink answer sheet with your personal details.
- It is very important that you **READ**, **SIGN** and **FILL IN THE DATE** on the **CONSENT FORM**.
- The test consists of two sections. Section A focuses on your educational and demographic background. Section B focuses on your understanding of some physics concepts.
- Each question in Section B should be answered using the following steps:

  Step 1: Select the correct answer and draw a circle around the corresponding letter.

  Step 2: Write down an explanation for your answer.

  Step 3: How confident are you that the answer you have given is correct? Circle the letter, that best indicates how certain you are about your answer, in the box that follows every question. For example, if you have totally guessed the answer, draw a circle around A, as shown below

Totally guessed answer	**Almost a guess**	**Almost certain**	**Certain**
(A)	B	C	D

- **IMPORTANT: WRITE YOUR ANSWERS TO ALL QUESTIONS ON THE TEST PAPER FIRST.**
- You will be provided with a pink answer sheet for computerized marking. Complete the top section of **SIDE ONE** of the pink sheet with your personal details. Transfer the data (your answers to all questions) to the pink sheet. **USE ONLY A PENCIL TO COMPLETE THE PINK SHEET.**
- **CALCULATORS ARE NOT ALLOWED DURING THE TEST.**

Section A: Background

Answer this section by drawing a circle around a letter, in this test booklet, that best describes your background.

What gender are you?

1

A. Male
B. Female

What is your home language?

2

A. An African language (e.g. Sepedi, Tshivhenda, siSwati, IsiZulu, IsiXhosa, Xitsonga, IsiNdebele, etc.)
B. Afrikaans
C. English
D. Another European language (e.g. French, Portuguese or German)
E. Other

What was the language of instruction used at your high school?

3

A. An African language (e.g. Sepedi, Tshivhenda, siSwati, IsiZulu, IsiXhosa, Xhitsonga, IsiNdebele, etc.)
B. Afrikaans
C. English
D. Another European language (e.g. French, Portuguese or German)
E. Other

Which language did your physical science teacher, at grade 12, frequently use?

4

A. An African language (e.g. Sepedi, Tshivhenda, siSwati, IsiZulu, IsiXhosa, Xitsonga, IsiNdebele, etc.)
B. Afrikaans
C. English
D. Another European language (e.g. French, Portuguese or German)
E. Other

At what kind of school did you finish your grade 12?

5

A. Private school
B. Township school
C. High school on a farm
D. High school in a rural area
E. High school in a town/city

Section B: Conceptual Understanding

6 Two metal balls are the same size, but one weighs twice as much as the other. The balls are dropped from the top of a two-story building at the same instant of time. The time it takes the balls to reach the ground below will be:

A. About half as long for the heavier ball.
B. About half as long for the lighter ball.
C. About the same time for both balls.
D. Considerably less for the heavier ball, but not necessarily half as long.
E. Considerably less for the lighter ball, but not necessarily half as long.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	**Almost a guess**	**Almost certain**	**Certain**
A	B	C	D

[41]

7

Imagine a head-on collision between a large truck and a small compact car. During collision:

A. The truck exerts a greater amount of force on the car than the car exerts on the truck.
B. The car exerts a greater amount of force on the truck than the truck exerts on the car.
C. Neither exerts a force on the other, the car gets smashed simply because it gets in the way of the truck.
D. The truck exerts a force on the car, but the car doesn't exert a force on the truck.
E. The truck exerts the same amount of force on the car as the car exerts on the truck.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[42]

8 A boy throws a steel ball straight up. **Disregarding any effect of air resistance**, the force(s) acting on the ball until it returns to the ground is(are)

A. Its weight vertically downward along with a steady decreasing upward force.
B. A steady decreasing upward force from the moment it leaves the hand until it reaches its highest point beyond which there is a steady increasing downward force of gravity as the ball gets closer to the earth.
C. A constant downward force of gravity along with an upward force that steadily decreases until the ball reaches its highest point, after which there is only the constant downward force of gravity.
D. A constant downward force of gravity only.
E. None of the above, the ball falls back down to earth simply because that is its natural action.

Step 1. Select the correct option and draw a circle around it.

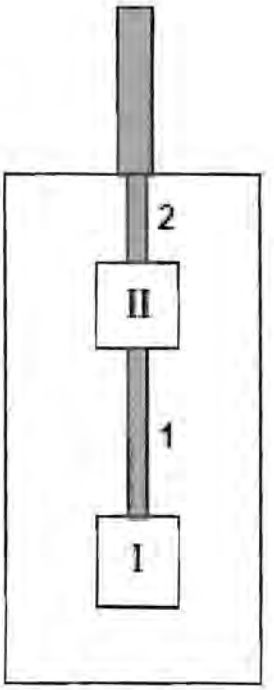
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[43]

Refer to the diagram below when answering questions 10 and 11.



Blocks I and II, each with a mass of 1.0 kg, are hung from the ceiling of an elevator by ropes 1 and 2.

10 What is the force exerted by rope 1 on block I when the elevator is traveling upwards at a constant speed of 2.0 m/s?

A. 2 N
B. 10 N
C. 12 N
D. 20 N
E. 22 N

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

_____

_____

_____

_____

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[45]

11 What is the force exerted by rope 1 on block II when the elevator is stationary?

A. 2 N
B. 10 N
C. 12 N
D. 20 N
E. 22 N

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[46]

12 A car has a maximum acceleration of 3.0 m/s^2. What would its maximum acceleration be while towing a second car twice its mass?

A. 2.5 m/s^2
B. 2.0 m/s^2
C. 1.5 m/s^2
D. 1.0 m/s^2
E. 0.5 m/s^2

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

_____

_____

_____

_____

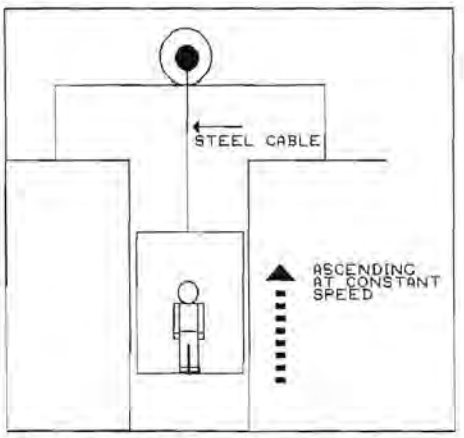
Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[47]

When responding to the following question, assume that any <u>friction forces</u> due to air resistance are so small that they <u>can be ignored</u>.

13 An elevator, as illustrated, is being lifted up an elevator shaft by a steel cable. When the elevator is moving up the shaft at **<u>constant velocity;</u>**



A. The upward force on the elevator by the cable is greater than the downward force of gravity.
B. The amount of upward force on the elevator by the cable is equal to that of the downward force of gravity.
C. The upward force on the elevator by the cable is less than the downward force of gravity.
D. It goes up because the cable is being shortened, not because of the force being exerted on the elevator by the cable.
E. The upward force on the elevator by the cable is greater than the downward force due to the combined effects of air pressure and the force of gravity.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

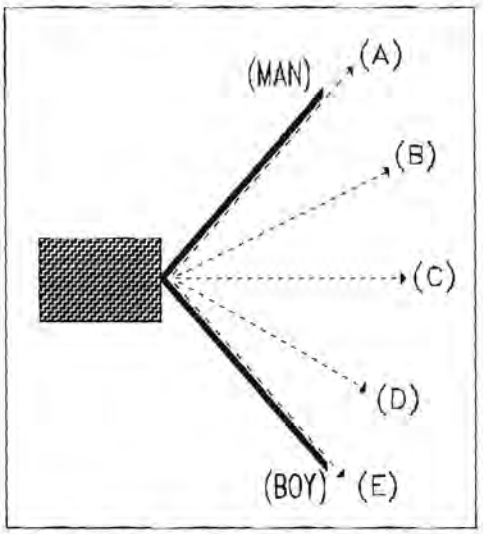
Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[48]

14 Two people, a large man and a boy, are pulling as hard as they can on two ropes attached to a crate as illustrated in the figure below.

Which of the indicated paths (A to E) would most likely correspond to the path of the crate as they pull it along?



Step 1. Select the correct option and draw a circle around it.

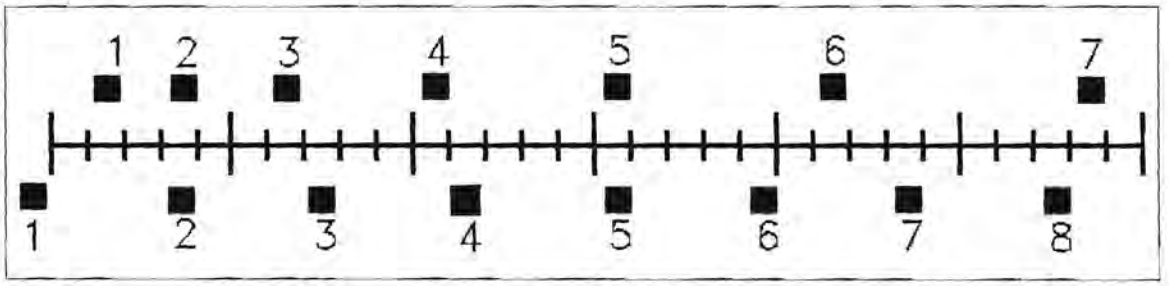
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[49]

The positions of two blocks at successive 0.20-second time intervals are represented by the numbered squares in the diagram below. The blocks are moving toward the right.



15 Do the blocks ever have the same speed?

A. No.
B. Yes, at instant 2.
C. Yes, at instant 5.
D. Yes, at instant 2 and 5.
E. Yes, at some time during interval 3 to 4.

Step 1. Select the correct option and draw a circle around it.

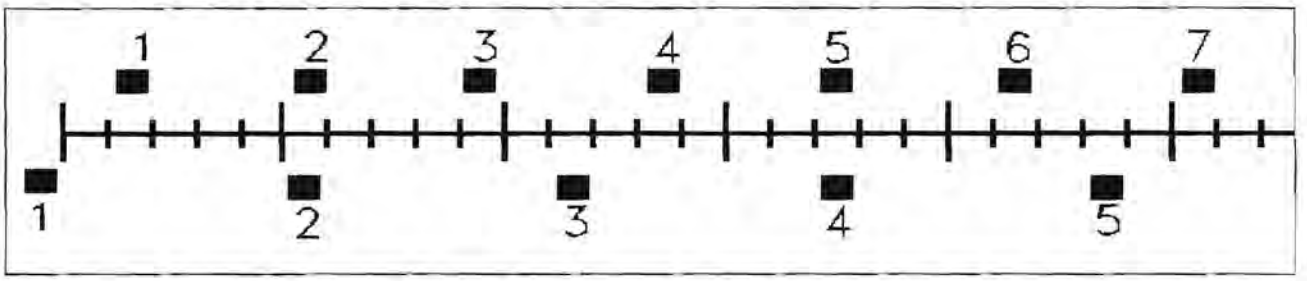
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[50]

The positions of two blocks at successive equal time intervals are represented by numbered squares in the diagram below. The blocks are moving toward the right. The top block is "a" while the bottom block is "b".



16 The acceleration of the blocks are related as follows:

A. Acceleration of "a" > acceleration of "b".
B. Acceleration of "a" = acceleration of "b" > 0.
C. Acceleration of "b" > acceleration of "a".
D. Acceleration of "a" = acceleration of "b" = 0.
E. Not enough information to answer.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

_____

_____

_____

_____

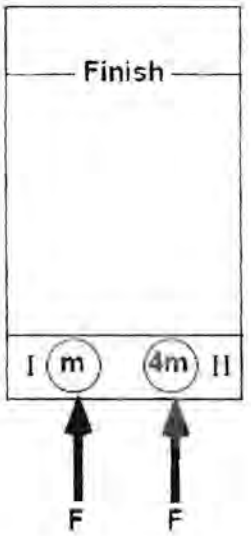
Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[51]

17

The diagram depicts two pucks on a frictionless table. Puck II is four times as massive as puck I. Starting from rest, the pucks are pushed across the table by two **equal** forces.



Which puck will reach the finish line first?

A. I B. II

C. They will both reach the finish line at the same time.

D. Too little information to answer.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[52]

18 A large box is being pushed across the floor at a constant speed of 4.0 m/s. What can you conclude about the forces acting on the box?

A. If the force applied to the box is doubled, the constant speed of the box will increase to 8.0 m/s.

B. The amount of force applied to move the box at a constant speed must be more than its weight.

C. The amount of force applied to move the box at a constant speed must be equal to the amount of the frictional forces that resist its motion.

D. The amount of force applied to move the box at a constant speed must be more than the amount of the frictional forces that resist its motion.

E. There is a force being applied to the box to make it move but the external forces such as friction are not 'real' forces, they just resist motion.

Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

_____

_____

_____

_____

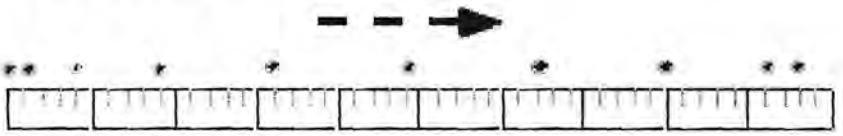
Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

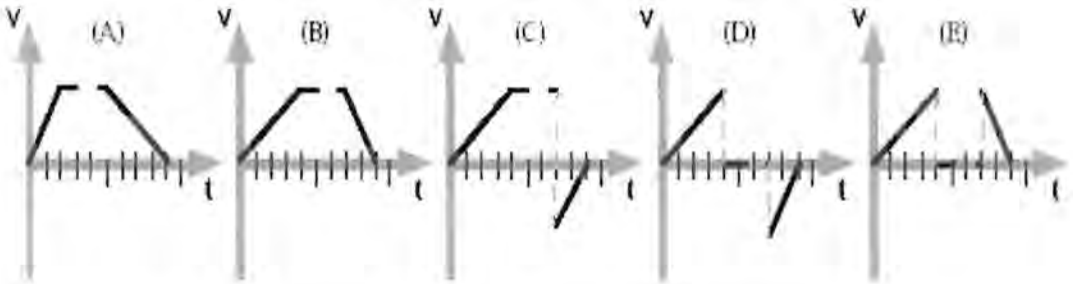
[53]

Refer to the diagram below when answering the next two questions (questions 19 & 20).

This diagram represents a multiflash of an object moving along a horizontal surface. The positions as indicated in the diagram are separated by equal time intervals. The first flash occurred just as the object started to move and the last flash just as it came to rest.



19 Which of the following graphs best represents the object's velocity as a function of time?



Step 1. Select the correct option and draw a circle around it.

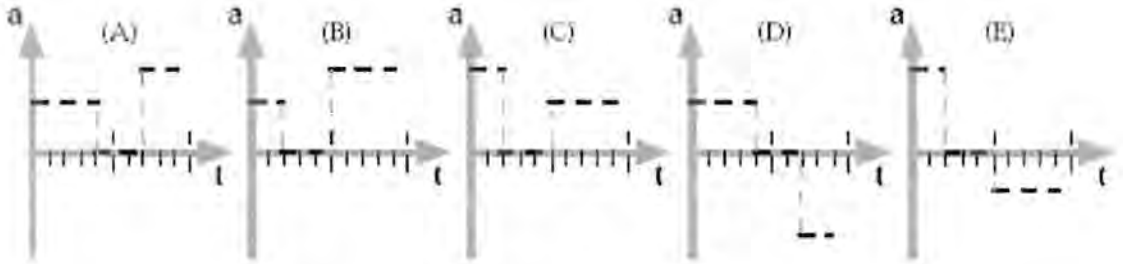
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[54]

20 Which of the following graphs best represents the object's acceleration as a function of time?



Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[55]

21 Consider the ticker tape trace below, which represent the motion of a car. The car is moving to the right.

What is the direction of the acceleration and the net force on the car?

	Acceleration	**Net force**
A.	To the right	To the right
B.	To the right	To the left
C.	To the left	To the right
D.	To the left	To the left
E.	The information supplied is not enough.	

Step 1. Select the correct option and draw a circle around it.

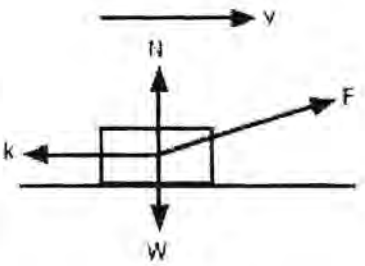
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	**Almost a guess**	**Almost certain**	**Certain**
A	B	C	D

[56]

22 A person pulls a block across a rough horizontal surface at a constant speed by applying a force F. The arrows in the diagram correctly indicate the directions, but not necessarily the magnitudes of the various forces on the block. Which of the following relations amoung the force magnitudes W, k, N and F must be true?



A. F = k and N = W
B. F = k and N > W
C. F > k and N < W
D. F > k and N = W
E. None of the above choices.

Step 1. Select the correct option and draw a circle around it.

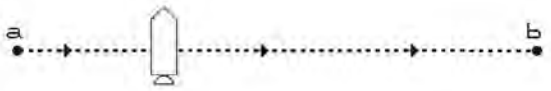
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

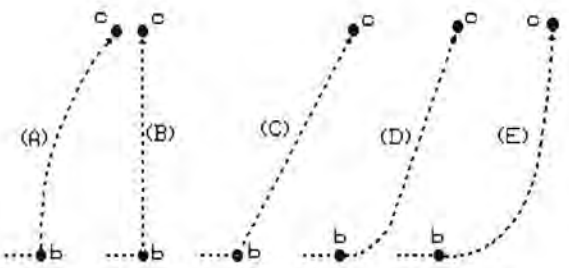
Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[57]

A rocket, drifting sideways in outer space from position "a" to position "b", is subjected to no outside forces. At "b" the rocket's engine starts to produce a constant thrust at right angles to line "ab". The engine turns off again as the rocket reaches point "c".



23 Which path below best represents the path of the rocket between "b" and "c"?



Step 1. Select the correct option and draw a circle around it.

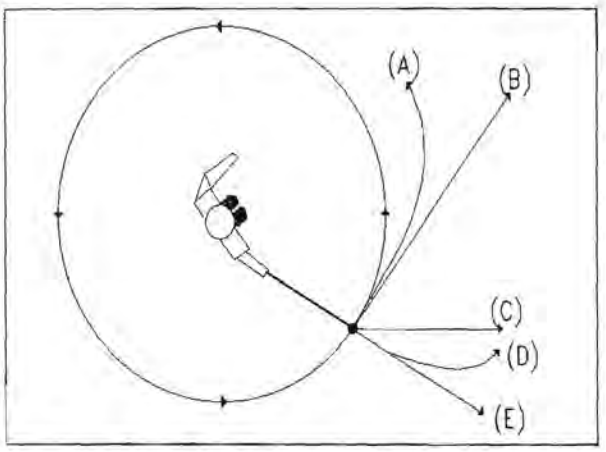
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[58]

24 A heavy ball is attached to a string and swung in a circular path in a horizontal plane as illustrated in the diagram below. At the point indicated in the diagram, the string suddenly breaks at the ball. If these events were observed from directly above, indicates the path of the ball after the string breaks.



Step 1. Select the correct option and draw a circle around it.

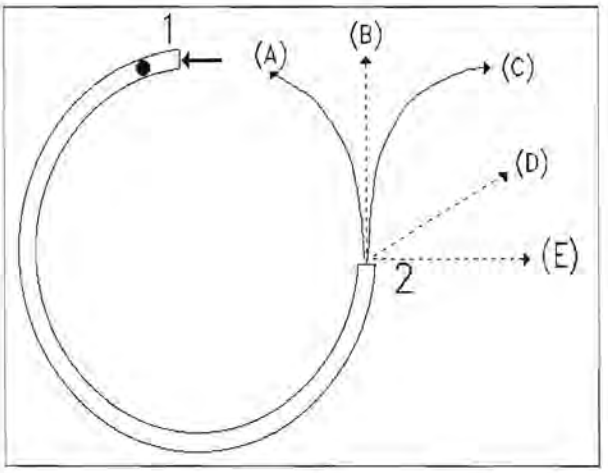
Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[59]

25 The accompanying diagram depicts a semicircular channel that has been securely attached, in a horizontal plane, to a table top. A ball enters the channel at "1" and exits at "2". Which of the path representations would most nearly correspond to the path of the ball as it exits the channel at "2" and rolls across the table top?



Step 1. Select the correct option and draw a circle around it.

Step 2. Write down an explanation for your answer.

Step 3. Circle the option below that best describes how you arrived at your answer.

Totally guessed answer	Almost a guess	Almost certain	Certain
A	B	C	D

[60]

APPENDIX C: Performance and Confidence of Students

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AA001	5	2.3	AB001	10	2.2	AB032	9	2.2
AA002	5	2.1	AB002	6	1.6	AB033	3	1.8
AA003	7	1.9	AB003	7	2.8	AB034	9	1.7
AA004	11	2.8	AB004	6	1.7	AB035	7	1.8
AA005	7	1.3	AB005	12	2.9	AB036	5	2.7
AA006	10	1.7	AB006	8	1.3	AB037	7	2.6
AA007	5	1.5	AB007	7	1.9	AB038	5	1.1
AA008	7	2.5	AB008	9	1.6	AB039	12	2.2
AA009	7	2.3	AB009	5	1.6	AB040	6	2.5
AA010	9	2.2	AB010	10	2.7	AB041	9	0.5
AA011	4	2.5	AB011	9	2.2	AB042	4	1.7
AA012	3	1.8	AB012	4	2.6	AB043	15	2.6
AA013	5	1.3	AB013	7	2.2	AB044	6	2.4
AA014	3	2.5	AB014	6	1.8	AB045	7	1.7
AA015	4	1.2	AB015	5	2.3	AB046	6	2.3
AA016	6	1.8	AB016	8	1.8	AB047	9	2.9
AA017	4	1.8	AB017	11	2.7	AB048	3	1.4
AA018	4	1.4	AB018	10	2.8	AB049	6	1.6
AA019	7	1.4	AB019	4	0.9	AB050	5	1.8
AA020	10	2.5	AB020	10	1.3	AB051	10	2.0
AA021	4	1.4	AB021	8	1.7	AB052	12	2.2
AA022	8	1.2	AB022	6	2.5	AB053	10	1.5
AA023	7	2.6	AB023	7	2.2	AB054	7	1.1
AA024	5	1.6	AB024	7	1.9	AB055	9	1.9
AA025	8	1.9	AB025	10	2.0	AB056	11	3.0
AA026	15	3.0	AB026	7	2.8	AB057	8	2.0
AA027	5	1.5	AB027	11	2.7	AB058	5	2.0
AA028	4	2.4	AB028	5	1.1	AB059	8	2.7
AA029	5	1.2	AB029	9	1.9	AB060	7	2.6
AA030	11	2.0	AB030	5	1.6	AB061	5	2.6
AA031	9	2.6	AB031	6	1.9	AB062	8	2.8

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AB063	8	2.2	AC026	10	2.5	AC057	11	2.2
AB064	6	1.6	AC027	8	1.8	AC058	6	3.0
AB065	12	2.8	AC028	10	2.1	AC059	10	2.7
AB066	4	1.8	AC029	17	2.0	AC060	8	2.0
AB067	10	1.6	AC030	5	2.5	AC061	4	1.9
AB068	10	1.4	AC031	11	2.8	AC062	9	1.9
AC001	6	2.4	AC032	7	2.5	AC063	8	2.5
AC002	15	2.9	AC033	16	3.0	AC064	15	2.1
AC003	9	2.4	AC034	6	2.1	AC065	10	1.2
AC004	13	2.7	AC035	16	2.7	AC066	8	1.5
AC005	8	1.8	AC036	8	1.9	AC067	12	2.5
AC006	13	2.4	AC037	4	2.0	AC068	6	1.9
AC007	7	1.9	AC038	8	2.6	AC069	8	1.9
AC008	13	2.0	AC039	11	1.7	AC070	14	2.4
AC009	13	1.8	AC040	17	2.3	AC071	11	2.3
AC010	11	2.8	AC041	10	1.9	AC072	13	2.9
AC011	13	2.9	AC042	7	1.6	AC073	13	2.2
AC012	10	2.2	AC043	10	2.2	AC074	9	2.7
AC013	11	1.5	AC044	9	2.7	AC075	11	2.2
AC014	14	2.4	AC045	6	1.6	AC076	6	2.1
AC015	13	2.6	AC046	13	2.6	AC077	13	2.1
AC016	9	1.9	AC047	7	2.4	AC078	12	2.1
AC017	9	1.4	AC048	9	1.8	AC079	11	2.0
AC018	5	2.1	AC049	5	1.3	AC080	6	1.6
AC019	8	1.2	AC050	12	2.4	AC081	3	1.0
AC020	13	2.1	AC051	13	2.7	AC082	9	1.7
AC021	10	1.5	AC052	2	1.7	AC083	13	2.7
AC022	9	1.6	AC053	8	1.7	AC084	10	1.9
AC023	8	2.2	AC054	15	1.9	AC085	10	2.1
AC024	14	2.6	AC055	10	1.6	AC086	5	1.4
AC025	7	0.9	AC056	9	2.1	AC087	14	2.9

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AC088	16	2.2	AC119	6	1.4	AC150	9	2.2
AC089	11	3.0	AC120	7	2.3	AC151	9	2.2
AC090	14	2.9	AC121	15	1.3	AC152	15	3.0
AC091	5	2.0	AC122	14	2.9	AC153	10	1.5
AC092	9	1.8	AC123	11	2.4	AC154	5	2.2
AC093	6	1.8	AC124	12	2.0	AC155	9	2.7
AC094	11	0.8	AC125	12	2.7	AC156	15	2.4
AC095	13	1.7	AC126	11	2.2	AC157	11	2.5
AC096	10	2.3	AC127	10	1.3	AC158	8	2.2
AC097	10	1.5	AC128	9	2.7	AC159	10	1.9
AC098	15	1.6	AC129	8	2.2	AC160	7	2.6
AC099	9	2.8	AC130	10	1.8	AC161	11	2.3
AC100	11	1.9	AC131	11	3.0	AC162	8	2.6
AC101	14	2.8	AC132	8	1.9	AC163	16	3.0
AC102	8	2.1	AC133	15	2.8	AC164	17	2.8
AC103	8	1.5	AC134	12	1.4	AC165	14	2.1
AC104	8	0.9	AC135	11	2.7	AC166	13	3.0
AC105	5	1.2	AC136	13	2.0	AC167	9	1.9
AC106	15	3.0	AC137	9	1.6	AC168	12	2.5
AC107	13	2.9	AC138	11	2.0	AC169	11	3.0
AC108	11	2.3	AC139	10	2.9	AC170	17	2.4
AC109	9	2.1	AC140	11	2.2	AC171	11	1.9
AC110	13	1.9	AC141	10	2.7	AC172	11	2.3
AC111	15	2.9	AC142	9	2.3	AC173	4	1.9
AC112	6	2.3	AC143	6	2.3	AC174	11	2.9
AC113	7	2.0	AC144	6	2.6	AC175	8	2.2
AC114	14	2.9	AC145	10	2.1	AC176	9	2.3
AC115	10	1.7	AC146	11	2.8	AC177	10	1.9
AC116	6	2.2	AC147	14	1.4	AC178	8	1.8
AC117	8	2.0	AC148	9	1.5	AC179	9	2.2
AC118	4	1.5	AC149	11	2.7	AC180	10	2.1

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AC181	12	2.1	AC212	13	2.6	AC243	13	1.9
AC182	8	0.9	AC213	7	2.2	AC244	12	2.3
AC183	9	2.1	AC214	9	2.0	AC245	9	2.1
AC184	14	2.8	AC215	12	1.9	AC246	10	1.5
AC185	10	2.1	AC216	5	1.7	AC247	16	3.0
AC186	9	2.4	AC217	9	1.9	AC248	10	2.7
AC187	13	2.1	AC218	10	1.9	AC249	11	2.5
AC188	14	1.8	AC219	8	2.1	AC250	12	2.6
AC189	7	1.7	AC220	8	1.5	AC251	9	2.4
AC190	13	1.6	AC221	9	2.2	AC252	16	3.0
AC191	8	2.0	AC222	11	2.4	AC253	9	2.3
AC192	7	1.8	AC223	12	2.4	AC254	6	1.7
AC193	11	2.3	AC224	12	1.6	AC255	10	1.8
AC194	10	2.4	AC225	9	2.3	AC256	16	2.9
AC195	5	2.0	AC226	11	1.4	AC257	8	1.5
AC196	17	2.2	AC227	12	2.7	AC258	12	2.7
AC197	6	1.8	AC228	8	2.5	AC259	12	1.6
AC198	8	2.1	AC229	8	1.8	AC260	7	2.1
AC199	8	2.0	AC230	10	2.3	AC261	10	2.3
AC200	5	1.6	AC231	9	2.1	AC262	11	1.8
AC201	10	2.6	AC232	8	1.9	AC263	6	2.1
AC202	15	2.5	AC233	7	2.4	AC264	5	2.5
AC203	12	3.0	AC234	13	2.4	AC265	6	2.3
AC204	13	2.2	AC235	7	2.2	AC266	13	2.7
AC205	4	0.7	AC236	11	2.1	AC267	12	1.8
AC206	9	3.0	AC237	9	2.3	AC268	9	1.3
AC207	11	1.8	AC238	9	2.5	AC269	6	2.8
AC208	13	2.0	AC239	11	1.4	AC270	13	2.5
AC209	11	1.6	AC240	6	1.4	AC271	17	2.4
AC210	6	1.8	AC241	11	1.4	AC272	12	2.2
AC211	16	2.6	AC242	8	1.9	AC273	11	2.9

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AC274	15	2.3	AC305	9	2.4	AC336	11	2.7
AC275	10	1.8	AC306	6	2.6	AC337	6	2.7
AC276	10	2.4	AC307	13	2.4	AC338	12	2.0
AC277	16	2.7	AC308	11	2.4	AC339	7	2.7
AC278	13	2.6	AC309	9	2.3	AC340	6	1.4
AC279	5	1.9	AC310	9	1.3	AC341	7	2.5
AC280	9	2.0	AC311	6	0.6	AC342	11	2.5
AC281	10	2.4	AC312	9	2.0	AC343	14	2.9
AC282	8	2.9	AC313	6	1.9	AC344	14	2.0
AC283	10	1.3	AC314	14	2.2	AC345	11	1.9
AC284	9	1.9	AC315	16	2.9	AC346	7	2.3
AC285	9	1.9	AC316	9	2.0	AC347	11	2.5
AC286	9	1.5	AC317	8	2.4	AC348	9	2.3
AC287	14	2.4	AC318	15	2.2	AC349	11	1.6
AC288	9	1.5	AC319	7	2.1	AC350	10	1.9
AC289	11	2.1	AC320	6	2.0	AC351	14	2.8
AC290	16	3.0	AC321	14	2.4	AC352	13	2.3
AC291	5	1.4	AC322	14	1.7	AC353	6	1.8
AC292	5	2.5	AC323	8	1.5	AC354	6	0.3
AC293	7	2.2	AC324	9	2.1	AC355	9	3.0
AC294	5	1.4	AC325	8	2.3	AC356	15	2.5
AC295	9	2.5	AC326	8	1.8	AC357	5	1.4
AC296	12	2.4	AC327	12	2.0	AC358	8	2.4
AC297	6	1.8	AC328	12	2.0	AC359	8	2.4
AC298	11	2.2	AC329	11	3.0	AC360	10	2.1
AC299	12	2.5	AC330	10	1.9	AC361	5	1.3
AC300	11	2.7	AC331	16	2.7	AC362	6	1.0
AC301	13	1.6	AC332	4	2.1	AC363	9	1.5
AC302	11	2.4	AC333	9	2.1	AC364	16	2.5
AC303	9	1.9	AC334	14	1.7	AC365	7	2.5
AC304	7	2.0	AC335	10	2.3	AC366	6	1.6

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AC367	10	2.7	AC398	6	1.8	AC429	7	1.9
AC368	13	1.9	AC399	13	2.4	AC430	10	2.4
AC369	13	2.5	AC400	6	1.7	AC431	16	2.2
AC370	9	2.1	AC401	12	2.6	AC432	11	2.8
AC371	10	2.7	AC402	10	2.1	AC433	11	2.3
AC372	12	1.4	AC403	9	1.9	AC434	6	2.4
AC373	6	2.1	AC404	15	2.4	AC435	12	1.9
AC374	8	2.0	AC405	14	1.8	AC436	12	1.9
AC375	14	2.2	AC406	9	2.0	AC437	8	2.4
AC376	9	2.1	AC407	11	1.9	AC438	12	2.2
AC377	6	1.7	AC408	11	1.0	AC439	8	2.3
AC378	6	1.7	AC409	15	2.0	AC440	16	2.9
AC379	8	1.6	AC410	13	2.5	AC441	7	2.1
AC380	11	1.7	AC411	14	2.2	AC442	10	2.3
AC381	12	1.5	AC412	12	2.7	AC443	10	2.6
AC382	12	1.6	AC413	14	2.8	AC444	11	2.0
AC383	5	2.6	AC414	7	2.3	AC445	15	2.0
AC384	13	2.1	AC415	6	1.5	AC446	16	3.0
AC385	16	2.2	AC416	16	2.4	AC447	13	2.8
AC386	16	2.3	AC417	8	0.9	AC448	8	2.0
AC387	8	2.3	AC418	9	2.2	AC449	12	2.0
AC388	9	1.6	AC419	6	2.0	AC450	17	2.2
AC389	8	1.9	AC420	15	2.7	AC451	8	2.1
AC390	12	2.0	AC421	8	1.3	AC452	15	2.8
AC391	11	1.6	AC422	16	2.8	AC453	5	1.0
AC392	9	1.9	AC423	6	1.3	AC454	9	1.7
AC393	9	1.5	AC424	13	2.0	AC455	16	2.4
AC394	16	2.7	AC425	10	2.0	AC456	3	1.2
AC395	4	2.4	AC426	12	2.0	AC457	5	2.0
AC396	7	1.2	AC427	9	1.9	AC458	10	2.9
AC397	5	1.6	AC428	9	2.7	AC459	8	1.9

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
AC460	6	2.1	AD008	17	3.0	BA006	6	2.0
AC461	10	2.0	AD009	4	0.8	BA007	13	1.5
AC462	7	1.9	AD010	13	2.4	BA008	4	1.8
AC463	7	1.6	AD011	8	2.0	BA009	4	2.0
AC464	13	2.3	AD012	7	2.3	BA010	8	1.4
AC465	10	3.0	AD013	7	1.8	BA011	7	1.9
AC466	12	2.6	AD014	10	2.5	BA012	7	1.7
AC467	6	2.0	AD015	8	2.2	BA013	10	1.9
AC468	15	2.9	AD016	6	2.2	BA014	9	1.8
AC469	9	1.8	AD017	9	1.3	BA015	9	2.6
AC470	11	2.8	AD018	11	2.6	BA016	3	1.7
AC471	7	2.1	AD019	11	2.1	BA017	11	1.4
AC472	7	1.8	AD020	8	1.2	BA018	8	1.3
AC473	6	1.5	AD021	15	2.2	BA019	14	2.7
AC474	11	1.4	AD022	13	2.8	BA020	11	1.4
AC475	9	2.5	AD023	12	2.1	BA021	8	1.1
AC476	15	2.1	AD024	7	2.4	BA022	7	1.6
AC477	14	2.4	AD025	9	2.6	BA023	8	2.9
AC478	11	2.0	AD026	17	2.1	BA024	8	1.8
AC479	11	2.8	AD027	10	1.5	BA025	7	1.2
AC480	11	1.8	AD028	16	3.0	BA026	11	1.9
AC481	18	3.0	AD029	17	2.8	BA027	11	1.5
AC482	9	1.9	AD030	7	2.3	BA028	9	2.1
AC483	10	2.4	AD031	11	1.7	BA029	5	1.8
AD001	12	3.0	AD032	13	2.7	BA030	4	2.4
AD002	18	2.9	AD033	10	1.4	BA031	5	1.2
AD003	10	2.5	BA001	13	2.5	BA032	6	2.1
AD004	11	2.7	BA002	5	2.1	BA033	15	1.5
AD005	9	2.4	BA003	2	2.3	BA034	11	2.2
AD006	10	2.7	BA004	8	2.1	BA035	6	1.6
AD007	13	2.5	BA005	8	2.5	BA036	5	1.3

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
BA037	9	2.1	BA068	8	2.3	BA099	6	1.6
BA038	9	1.9	BA069	9	1.9	BA100	8	2.6
BA039	10	1.7	BA070	8	1.1	BA101	4	2.4
BA040	8	1.5	BA071	6	2.5	BA102	8	1.0
BA041	4	2.7	BA072	9	1.1	BA103	6	1.4
BA042	6	1.7	BA073	5	2.3	BA104	10	1.7
BA043	10	2.5	BA074	8	1.8	BA105	7	1.9
BA044	8	1.6	BA075	6	1.9	BA106	5	2.1
BA045	10	1.7	BA076	8	2.3	BA107	9	1.3
BA046	4	1.7	BA077	7	1.9	BA108	3	2.6
BA047	5	0.4	BA078	5	0.9	BA109	14	2.9
BA048	7	2.7	BA079	8	1.9	BA110	11	1.9
BA049	14	2.8	BA080	9	2.7	BA111	8	2.3
BA050	6	2.1	BA081	5	1.2	BA112	8	2.3
BA051	9	2.0	BA082	9	2.0	BA113	7	2.2
BA052	11	2.6	BA083	3	2.0	BA114	7	2.4
BA053	5	2.2	BA084	4	0.6	BA115	7	0.9
BA054	4	1.1	BA085	4	2.4	BA116	7	1.5
BA055	11	2.7	BA086	7	1.5	BA117	4	1.6
BA056	9	1.9	BA087	9	2.5	BA118	6	2.0
BA057	11	2.2	BA088	7	2.1	BA119	5	1.6
BA058	12	2.8	BA089	5	2.2	BA120	4	1.8
BA059	7	1.2	BA090	7	1.3	BA121	3	1.3
BA060	7	1.7	BA091	11	2.8	BA122	6	2.1
BA061	9	0.8	BA092	9	2.2	BA123	7	2.5
BA062	6	1.6	BA093	9	1.9	BA124	9	1.7
BA063	10	2.5	BA094	10	2.3	BA125	8	1.8
BA064	6	2.5	BA095	9	1.8	BA126	7	1.5
BA065	9	2.3	BA096	8	2.0	BA127	7	1.9
BA066	5	1.5	BA097	7	2.8	BA128	5	2.1
BA067	6	0.9	BA098	8	1.1	BA129	7	1.8

APPENDIX C: Performance and Confidence of Students (Continued)

Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
BA130	6	1.3	CA018	5	1.5	CA049	6	2.0
BA131	6	0.9	CA019	4	1.6	CA050	6	1.2
BA132	12	2.5	CA020	10	2.6	CA051	6	2.3
BA133	7	1.4	CA021	3	1.8	CA052	9	2.2
BA134	9	2.5	CA022	7	2.1	CA053	5	2.9
BA135	8	2.3	CA023	8	1.8	CA054	5	1.1
BA136	4	1.6	CA024	5	1.5	CA055	5	1.3
BA137	2	1.9	CA025	7	1.6	CA056	9	2.7
BA138	10	2.6	CA026	8	1.6	CA057	8	1.2
BA139	8	1.5	CA027	7	2.8	CA058	6	1.7
BA140	7	1.5	CA028	5	2.5	CA059	6	0.5
BA141	7	1.9	CA029	5	2.4	CA060	7	2.2
BA142	7	2.2	CA030	6	2.2	CA061	8	1.5
BA143	6	1.7	CA031	7	1.9	CA062	3	1.2
CA001	6	1.2	CA032	3	2.1	CA063	6	0.9
CA002	5	1.5	CA033	6	2.5	CA064	7	2.8
CA003	3	0.8	CA034	4	2.0	CA065	7	2.0
CA004	5	1.8	CA035	8	2.5	CA066	5	2.3
CA005	8	1.6	CA036	6	2.4	CA067	3	1.8
CA006	9	1.7	CA037	3	1.6	CA068	5	1.2
CA007	7	2.4	CA038	5	2.5	CA069	5	1.6
CA008	3	1.8	CA039	2	2.8	CA070	4	2.2
CA009	5	2.8	CA040	4	1.3	CA071	7	1.9
CA010	6	1.8	CA041	3	1.3	CA072	7	0.9
CA011	7	1.9	CA042	1	1.0	CA073	5	2.1
CA012	4	2.6	CA043	2	1.5	CA074	7	2.6
CA013	10	3.0	CA044	6	1.0	CA075	7	2.6
CA014	4	2.1	CA045	4	2.3	CA076	5	1.5
CA015	9	1.2	CA046	8	2.3	CA077	6	1.5
CA016	4	1.9	CA047	6	2.7	CA078	4	2.7
CA017	5	2.2	CA048	8	2.2	CA079	8	2.8

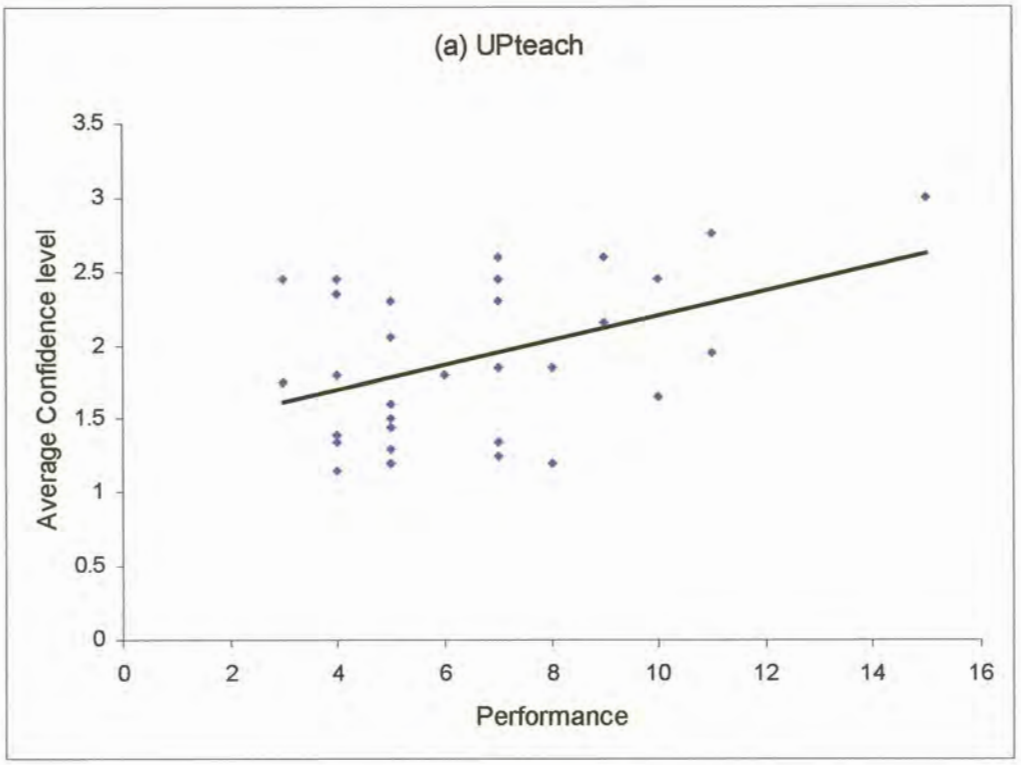
APPENDIX C: Performance and Confidence of Students (Continued)

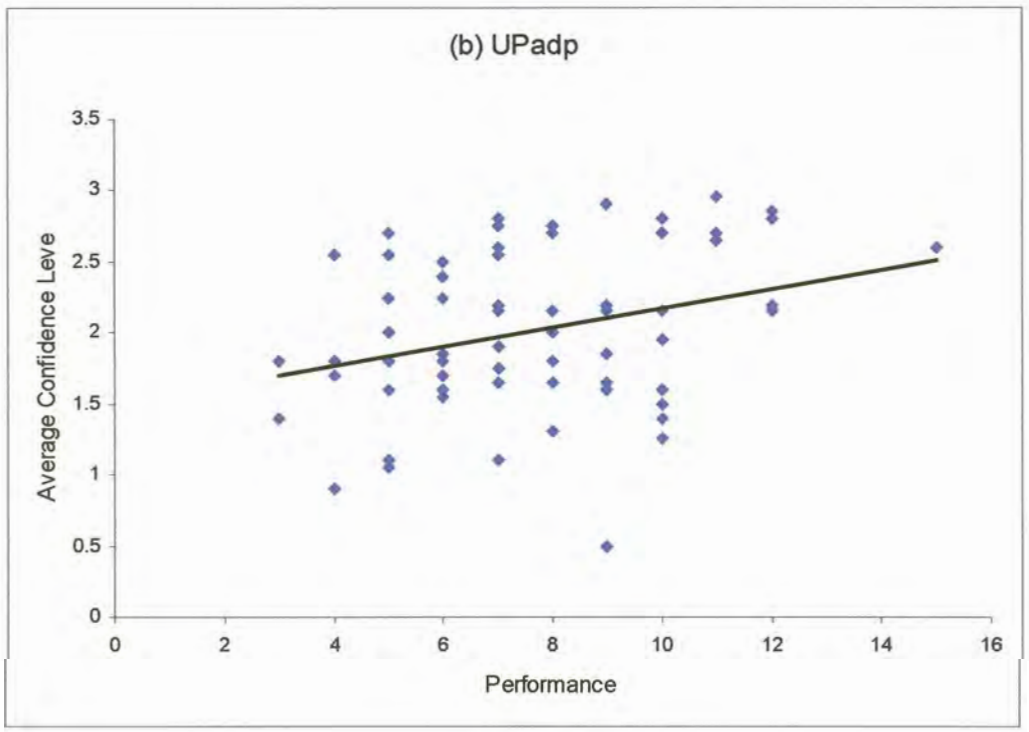
Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
CA080	4	2.0	CB009	9	2.5	CB040	4	2.3
CA081	6	2.0	CB010	11	2.7	CB041	5	1.7
CA082	8	2.1	CB011	4	1.8	CB042	8	1.8
CA083	4	1.8	CB012	13	1.5	CB043	5	2.1
CA084	4	2.0	CB013	4	1.7	CB044	6	1.8
CA085	3	1.2	CB014	5	1.7	CB045	10	1.6
CA086	8	1.9	CB015	3	2.2	CB046	9	2.7
CA087	5	1.8	CB016	8	1.4	CB047	6	2.2
CA088	2	1.5	CB017	5	1.3	CB048	6	2.4
CA089	8	2.4	CB018	3	2.2	CB049	6	0.8
CA090	3	1.2	CB019	2	2.2	CB050	4	2.3
CA091	5	1.8	CB020	6	1.8	CB051	4	2.4
CA092	8	1.7	CB021	5	1.6	CB052	5	2.4
CA093	5	2.1	CB022	7	1.8	CB053	7	2.0
CA094	6	2.1	CB023	11	2.9	CB054	14	2.1
CA095	6	2.1	CB024	3	2.1	CB055	9	1.8
CA096	3	2.5	CB025	7	1.9	CB056	8	2.0
CA097	6	0.5	CB026	7	2.3	CB057	5	1.8
CA098	5	1.6	CB027	10	3.0	CB058	9	2.0
CA099	5	2.3	CB028	5	2.3	CB059	8	2.6
CA100	8	2.0	CB029	9	2.3	CB060	8	3.0
CA101	6	2.2	CB030	8	2.4	CB061	9	2.4
CA102	4	1.6	CB031	5	1.7	CB062	8	1.5
CB001	10	2.1	CB032	3	1.3	CB063	8	2.1
CB002	7	1.5	CB033	8	1.7	CB064	12	1.9
CB003	5	1.7	CB034	4	2.2	CB065	8	2.3
CB004	14	2.1	CB035	8	2.8	CB066	14	2.0
CB005	4	2.1	CB036	2	2.4	CB067	7	2.0
CB006	5	2.8	CB037	9	2.9	CB068	9	1.9
CB007	9	2.4	CB038	3	1.7	CB069	2	1.5
CB008	9	1.9	CB039	11	1.0	CB070	7	1.5

APPENDIX C: Performance and Confidence of Students (Continued)

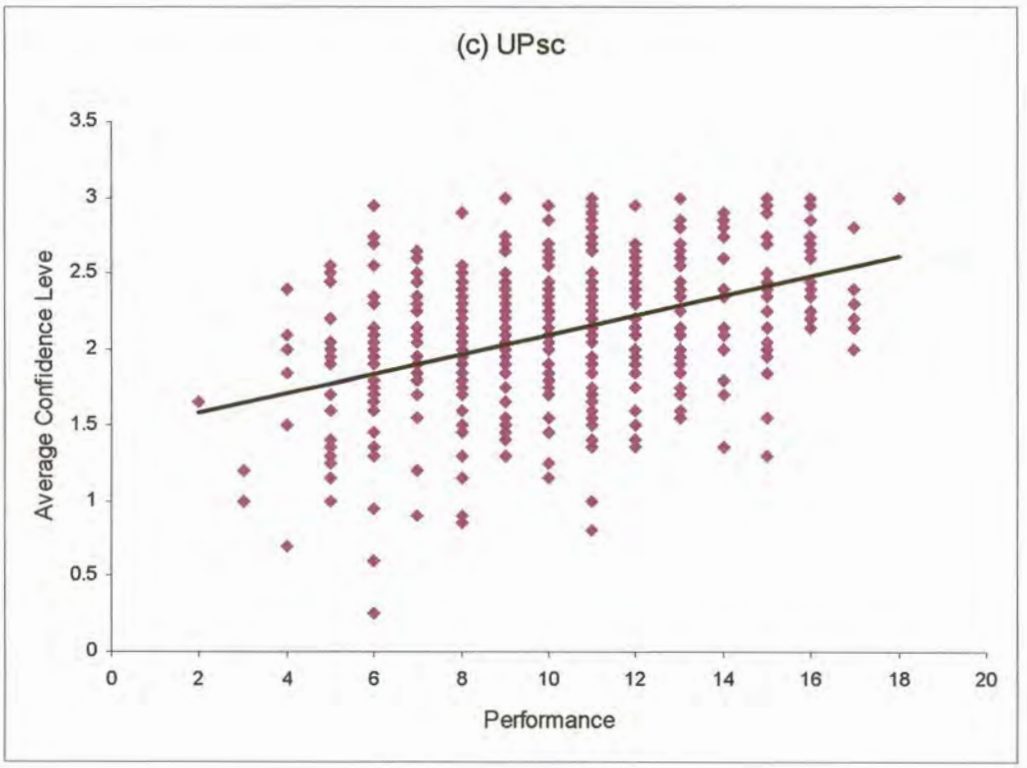
Student Code	Performance	Confidence Level	Student Code	Performance	Confidence Level
CB071	8	1.9	CC023	5	1.6
CB072	6	2.3	CC024	6	2.4
CB073	2	2.8	CC025	7	1.8
CB074	3	2.5	CC026	8	2.4
CB075	5	2.2	CC027	4	2.1
CB076	4	1.4	CC028	12	2.8
CB077	5	2.5	CC029	8	1.1
CB078	7	1.9	CC030	10	2.6
CB079	10	2.3	CC031	7	2.2
CC001	9	1.3	CC032	12	2.0
CC002	10	1.6	CC033	8	2.1
CC003	9	2.0	CC034	5	2.8
CC004	12	1.8	CC035	8	2.0
CC005	10	1.8	CC036	5	2.5
CC006	10	2.8	CC037	2	1.2
CC007	9	1.2	CC038	8	1.0
CC008	3	1.8	CC039	7	2.1
CC009	10	1.9	CC040	6	2.3
CC010	11	1.6	CC041	3	1.8
CC011	5	2.4	CC042	2	2.0
CC012	9	2.3	CC043	9	2.2
CC013	8	1.8			
CC014	8	2.3			
CC015	10	1.9			
CC016	7	1.5			
CC017	8	2.7			
CC018	6	2.5			
CC019	5	2.4			
CC020	3	1.8			
CC021	7	2.2			
CC022	4	1.8			

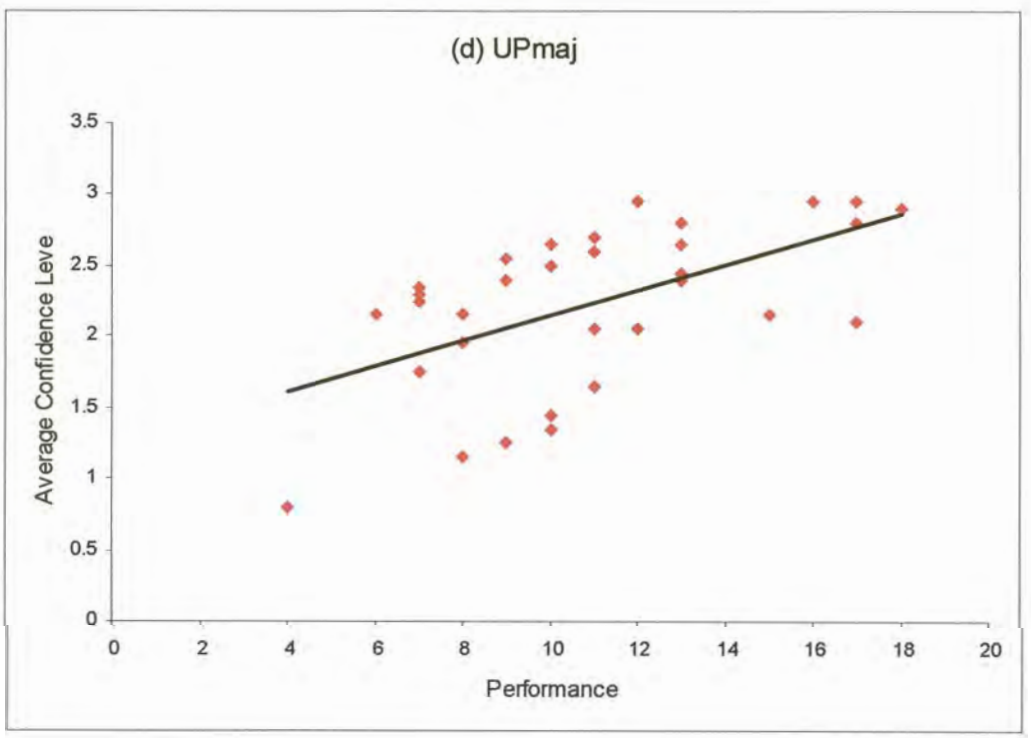
APPENDIX D: Scatter plots for the performance and confidence levels of students



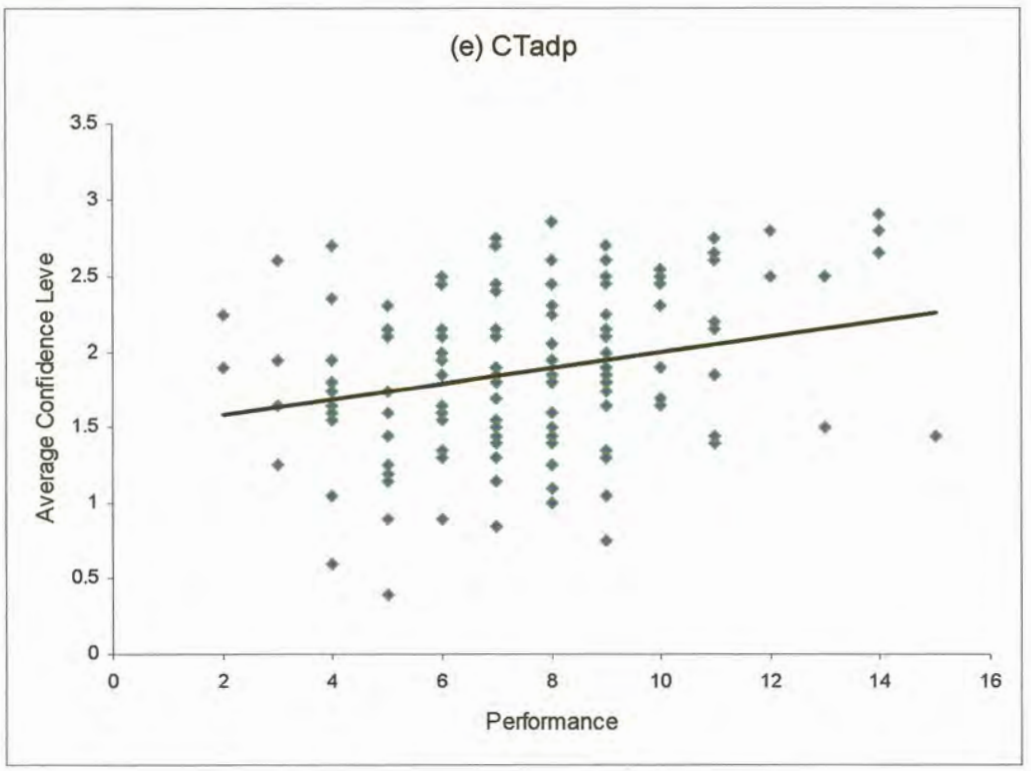


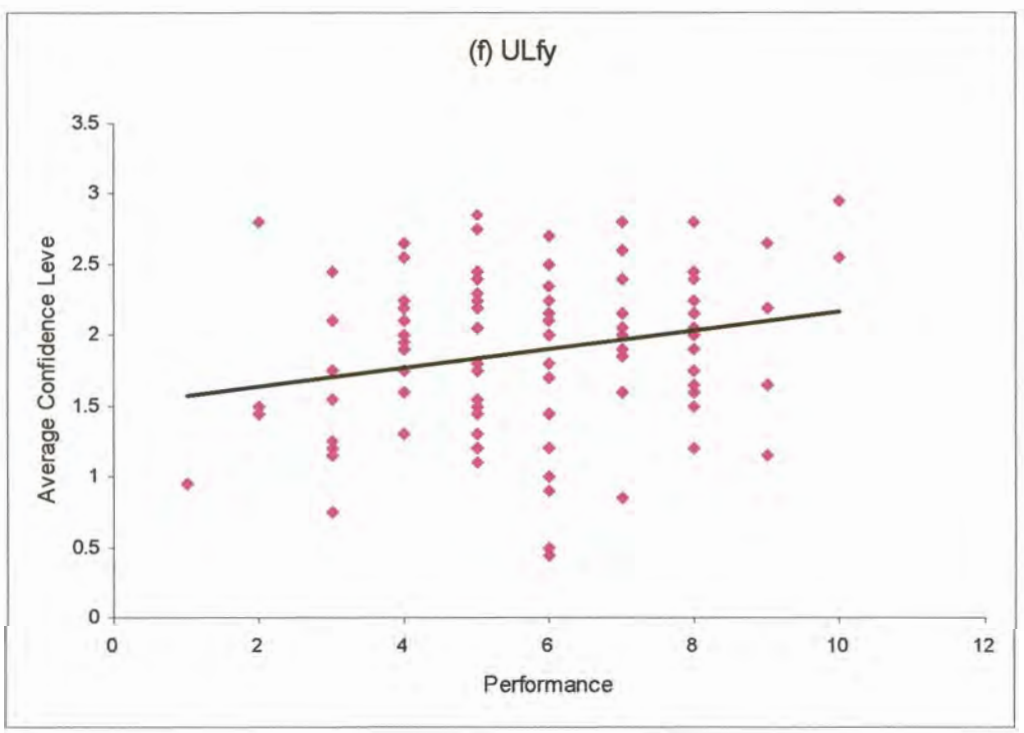
APPENDIX D: Scatter plots for the performance and confidence levels of students



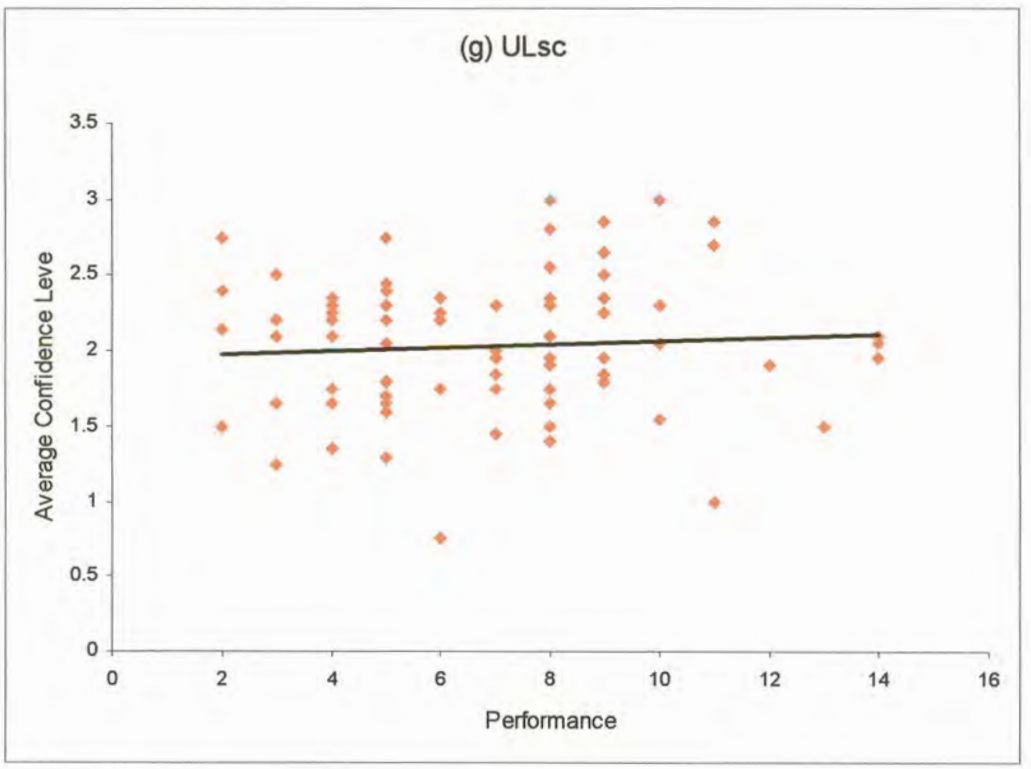


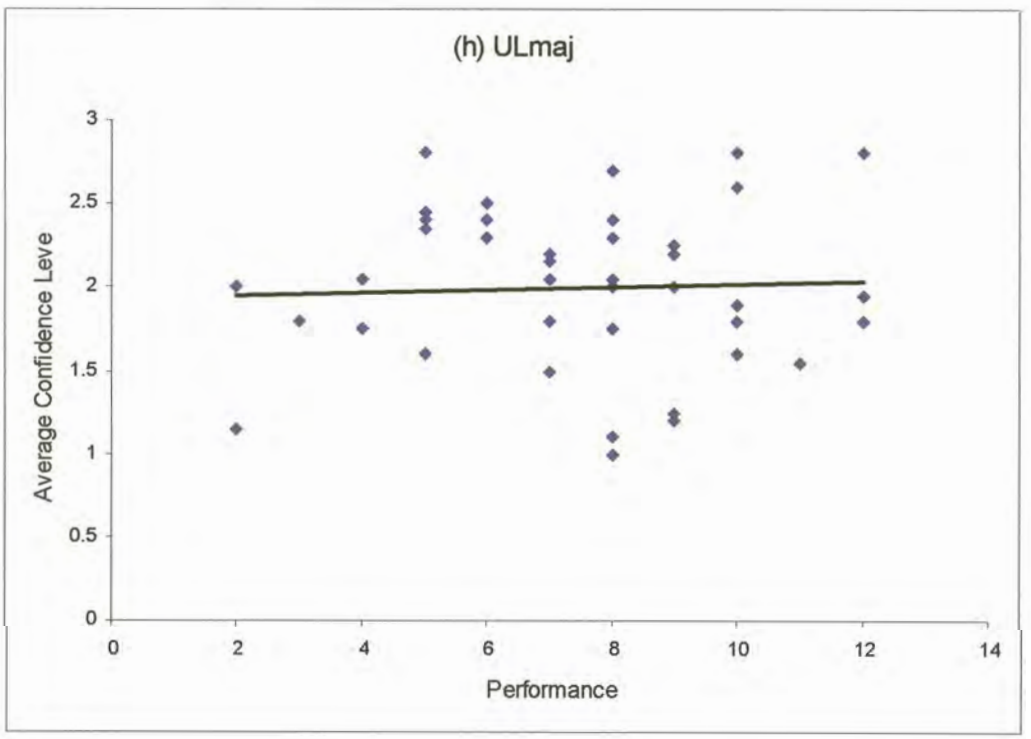
APPENDIX D: Scatter plots for the performance and confidence levels of students





APPENDIX D: Scatter plots for the performance and confidence levels of students





APPENDIX E: Students' Educational Backgrounds

		UPteach	UPadp	UPsc	UPmaj	CTadp	ULfy	ULsc	ULmaj
Gender	Male	23	32	183	21	84	54	46	25
	Female	8	36	300	12	59	48	33	18
Home Language	African Language	22	27	60	13	90	101	78	43
	Afrikaans	6	27	213	12	7		1	
	English	3	13	190	7	42			
	Another European Language		1	12		1	1		
	Other			8	1	3			
Secondary School Medium of Instruction	African Language	4	4	1	2	8	13	11	7
	Afrikaans	6	39	177	11	5	2	1	
	English	21	25	305	20	130	87	67	36
Medium of Instruction by Grade 12 Teacher	African Language	2	2	5	3	12	3	3	4
	Afrikaans	6	28	178	11	3	4	1	
	English	23	38	300	19	128	95	75	39
Type of Grade 12 Secondary School	Private	2	6	123	6	27	16	12	4
	Township	4	4	25	6	34	20	8	9
	Farm	1	3	3		1	4	1	1
	Rural	13	8	34	6	22	50	48	27
	Town/City	11	47	298	15	59	12	10	2