

## ***APPENDIX I***

## APPENDIX I

## THE CALCULATION OF ALPHA RELIABILITY (ELECTRICITY)

[illegible]

## ***APPENDIX II***

## APPENDIX II

### THE CALCULATION OF ALPHA RELIABILITY (BANKING)

[illegible]

## ***APPENDIX III***

### APPENDIX III

#### THE CALCULATION OF ANOVA

Subject	Formula				Total
	IPA-F	IPA-UF	IPS-F	IPS-UF	
1	80	46	85	26	
2	83	73	90	47	
3	60	80	68	58	
4	53	78	65	62	
5	70	52	73	45	
6	90	46	94	37	
7	83	78	76	80	
8	96	60	50	72	
9	66	85	46	56	
10	70	73	78	63	
11	67	60	76	30	
12	75	76	70	52	
13	77	79	82	70	
14	82	52	61	50	
15	76	73	69	63	
16	50	70	56	40	
17	85	78	74	45	
18	56	58	82	72	
19	85	60	56	52	
20	50	65	78	37	
21	92	71	90	60	
22	90	90	80	35	
23	63	45	63	56	
24	73	73	60	72	
25	75	62	82	60	
n	25	25	25	25	100
$\bar{x}$	74,04	67,32	72,16	53,60	----
$\sum X_i$	1851	1683	1804	1340	
$\sum X_i^2$	3426201	2832489	3254416	1795600	11308706

#### A. The Calculation of Sum of Squares

$$j = 4$$

$$n = 25$$

$$N = 100$$

$$(\sum Yy^2_{ij}) = 469430$$

$$X = \sum Xi = 6675$$

$$SS_T = \left( \sum X^2_{ij} - \frac{J^2}{N} \right) = 23473,16$$

$$SS_B = \frac{(\sum X^2_i)}{n} - \frac{J^2}{N} = 6391,4$$

$$SS_W = SS_T - SS_B = 17081,76$$

#### B. The table of ANOVA

Source of Variance	df	SS	MS	Fo	F(5%)
Between	3	6391,40	2130,467	11,97	2,68
Within	96	17081,76	177,935		
Total	99	23473,16	-	-	-

$$df(\text{Total}) = Jn - 1$$

$$df(\text{Between}) = J - 1$$

$$df(\text{Within}) = df(\text{Total} - \text{Between})$$

$$Fo = MS_B - MS_W$$

#### C. The Testing Hypotheses

Ho :  $Fo \leq F(5\%)$ , there is no significance difference as the result of different treatments

Ha :  $Fo > F(5\%)$ , there is a significance difference as the result of different treatments

#### D. Conclusion

Because F observation is greater than F(5%),  $11,97 > 2,68$ , so Ho is rejected. Hence we conclude that there is a significance difference as the result of different treatments

## ***APPENDIX IV***

## APPENDIX IV

### THE CALCULATION OF TUCKEY METHOD

Treatments	Difference of means (d)	Conclusion
IPA-F Vs IPA-UF	6,72	no significance
IPA-F Vs IPS-F	1,88	no significance
IPA-UF Vs IPS-UF	13,72	significance
IPS-F Vs IPS-UF	18,56	significance

Where:

The mean of IPA-F : 74,04       $n_1 = 25$

The mean of IPA-UF : 67,32       $n_2 = 25$

The mean of IPA-F : 72,16       $n_3 = 25$

The mean of IPS-UF : 53,60       $n_4 = 25$

The calculation of HSD(5%):

$df = 99$

$MS = 177,935$

$q = 4,50$  (from table)

$j = 4$

$$HSD(5\%) = q \sqrt{\frac{MS}{n}}$$

## ***APPENDIX V***

## APPENDIX V

### THE CALCULATION OF ITEM DISCRIMINATION AND ITEM DIFFICULTY

#### A. First Passage: Electricity

	Subject	1	2	3	4	5	6	7	8	Total
u p p e r  g r o u p	1	1	1	1	1	1	1	1	1	96
	2	1	1	1	0	1	1	1	1	88
	3	1	1	1	1	1	1	1	1	85
	4	1	1	1	1	0	0	1	1	85
	5	1	1	1	0	1	1	1	1	84
	6	1	1	1	1	1	1	0	1	82
	7	1	1	1	1	0	1	0	1	82
	8	1	1	1	1	1	1	1	1	82
	9	1	1	1	1	1	1	0	1	81
	10	1	1	1	1	1	1	0	0	80
	11	1	1	1	0	1	1	0	1	79
	12	1	1	1	1	1	0	1	0	79
	13	1	1	1	1	1	1	0	1	78
	14	1	1	1	1	1	1	0	0	77
	15	1	1	1	1	0	1	1	0	74
l o w e r  g r o u p	16	1	1	1	0	1	1	1	0	74
	17	1	1	1	1	1	1	1	0	72
	18	1	1	0	1	1	1	1	0	72
	19	1	1	1	1	1	0	0	1	71
	20	1	1	1	1	1	0	0	1	69
	21	1	0	0	1	0	1	1	0	66
	22	1	1	1	0	0	1	1	0	62
	23	1	0	0	1	1	0	0	0	62
	24	1	1	1	0	0	1	1	0	62
	25	1	1	1	0	0	0	0	1	61
	26	1	1	0	1	0	1	1	0	58
	27	1	0	1	0	1	1	1	0	57
	28	1	1	0	0	0	0	0	0	50
	29	1	1	0	0	0	0	0	0	48
	30	1	0	1	1	1	0	0	0	38

where the notation:

1 is the students who have correct answers

0 is the students who have wrong answers

while the weigh of each item for correct answers:

item 1: 8

item 3: 10

item 7: 20

item 2: 8

item 4: 10

item 8: 20

item 5: 10

item 6: 10

Number of item	Difficulty Index	Discrimination Index
1.	$FV = \frac{26}{30} = 86,6\%$	$D = \frac{15 - 15}{30} = 0,00$
2.	$FV = \frac{24}{30} = 80\%$	$D = \frac{15 - 11}{15} = 0,27$
3.	$FV = \frac{30}{30} = 100\%$	$D = \frac{15 - 9}{30} = 0,40$
4.	$FV = \frac{20}{30} = 60\%$	$D = \frac{12 - 8}{15} = 0,26$
5.	$FV = \frac{20}{30} = 60\%$	$D = \frac{12 - 8}{15} = 0,26$
6.	$FV = \frac{21}{30} = 70\%$	$D = \frac{13 - 8}{15} = 0,33$
7.	$FV = \frac{16}{30} = 53,3\%$	$D = \frac{8 - 8}{15} = 0,00$
8.	$FV = \frac{14}{30} = 46\%$	$D = \frac{11 - 3}{15} = 0,53$
Formula	$FV = \frac{R}{N} = \frac{\text{correct\_answer}}{\text{number\_of\_testee}}$	$D = \frac{\text{correct\_U} - \text{correct\_L}}{n}$ n = 50% X 30 = 15

## APPENDIX VI

### THE CALCULATION OF ITEM DISCRIMINATION AND ITEM DIFFICULTY

#### B. Second Passage

	Subject	1	2	3	4	5	6	7	8	Total
u p p e r  g r o u p	1	1	1	1	1	1	1	1	1	91
	2	1	1	1	1	1	0	1	1	88
	3	1	1	1	0	1	1	1	0	84
	4	1	1	1	1	1	1	0	1	83
	5	1	1	0	1	1	0	0	1	83
	6	1	1	1	1	1	1	0	1	83
	7	1	1	1	1	0	1	1	0	81
	8	1	0	1	1	1	0	1	1	80
	9	1	1	1	1	1	1	0	0	77
	10	1	1	1	1	0	0	0	0	77
	11	1	0	0	1	1	1	1	1	76
	12	0	1	1	1	1	1	0	0	74
	13	1	1	1	1	1	0	0	0	73
	14	1	1	1	1	1	0	0	0	72
l o w e r  g r o u p	15	0	0	1	0	1	1	0	0	68
	16	1	1	1	0	0	0	0	1	68
	17	1	1	1	1	1	1	0	0	63
	18	0	1	0	1	0	1	0	0	62
	19	1	1	1	0	1	1	0	0	61
	20	1	0	0	1	1	0	0	0	60
	21	1	1	1	0	0	1	1	0	59
	22	1	0	1	1	0	0	0	0	58
	23	1	1	0	1	0	1	1	0	56
	24	1	1	1	0	0	0	0	0	56
	25	1	1	0	0	0	0	0	1	55
	26	1	1	0	0	1	0	0	0	49
	27	0	1	0	0	0	1	0	0	37

where the notation:

1 is the students who have correct answers

0 is the students who have wrong answers

While the weigh of each item for correct answer:

item 1: 8

item 3: 10

item 7: 20

item2: 8

item 4: 10

item 8: 20

item 5: 10

item 6: 10

Number of item	Difficulty Index	Discrimination Index
1.	$FV = \frac{24}{27} = 88\%$	$D = \frac{13}{14} - \frac{10}{13} = 0,16$
2.	$FV = \frac{22}{27} = 81\%$	$D = \frac{12}{14} - \frac{10}{13} = 0,09$
3.	$FV = \frac{19}{27} = 70\%$	$D = \frac{12}{14} - \frac{7}{13} = 0,32$
4.	$FV = \frac{18}{27} = 66\%$	$D = \frac{13}{14} - \frac{5}{13} = 0,54$
5.	$FV = \frac{17}{27} = 62\%$	$D = \frac{12}{14} - \frac{5}{13} = 0,47$
6.	$FV = \frac{15}{27} = 55\%$	$D = \frac{8}{14} - \frac{7}{13} = 0,02$
7.	$FV = \frac{9}{27} = 30\%$	$D = \frac{6}{14} - \frac{2}{13} = 0,30$
8.	$FV = \frac{5}{27} = 18\%$	$D = \frac{7}{14} - \frac{2}{13} = 0,35$
Formula	$FV = \frac{R}{N} = \frac{\text{correct\_answer}}{\text{number\_of\_testee}}$	$D = \frac{\text{correct\_U} - \text{correct\_L}}{n}$  $n = 50\% \times 27 = 13,5$ $n_1 = 14$ $n_2 = 13$

TABLE VII

db penye- but	db pembilang												
	01	1	2	3	4	5	6	7	8	9	10	11	12
1	.25	5.83	7.50	8.20	8.58	8.82	8.98	9.10	9.19	9.26	9.32	9.36	9.41
	.10	39.9	49.5	53.6	55.8	57.2	58.2	58.9	59.4	59.9	60.2	60.5	60.7
	.05	161	200	216	225	230	234	237	239	241	242	243	244
	.01	99.5	99.0	99.2	99.2	99.3	99.3	99.4	99.4	99.4	99.4	99.4	99.4
2	.25	2.57	3.00	3.15	3.23	3.28	3.31	3.34	3.35	3.37	3.38	3.39	3.39
	.10	8.53	9.80	9.16	9.24	9.29	9.33	9.35	9.37	9.38	9.39	9.40	9.41
	.05	18.5	19.0	19.2	19.2	19.3	19.3	19.4	19.4	19.4	19.4	19.4	19.4
	.01	99.5	99.0	99.2	99.2	99.3	99.3	99.4	99.4	99.4	99.4	99.4	99.4
3	.25	2.02	2.28	2.36	2.39	2.41	2.42	2.43	2.44	2.44	2.44	2.45	2.45
	.10	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24	5.23	5.22	5.22
	.05	10.1	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.76	8.74
	.01	34.1	30.8	29.5	28.7	28.2	27.9	27.7	27.5	27.3	27.2	27.1	27.1
4	.25	1.81	2.00	2.05	2.06	2.07	2.08	2.08	2.08	2.08	2.08	2.08	2.08
	.10	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94	3.92	3.91	3.90
	.05	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.94	5.91
	.01	21.2	18.0	16.7	16.0	15.5	15.2	15.0	14.8	14.7	14.5	14.4	14.4
5	.25	1.69	1.85	1.88	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89
	.10	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32	3.30	3.28	3.27
	.05	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.71	4.68
	.01	16.3	13.3	12.1	11.4	11.0	10.7	10.5	10.3	10.2	10.1	9.96	9.89
6	.25	1.62	1.76	1.78	1.79	1.79	1.78	1.78	1.78	1.77	1.77	1.77	1.77
	.10	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96	2.94	2.92	2.90
	.05	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.03	4.00
	.01	13.7	10.9	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.79	7.72
7	.25	1.57	1.70	1.72	1.72	1.71	1.71	1.70	1.70	1.69	1.69	1.69	1.68
	.10	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72	2.70	2.68	2.67
	.05	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.60	3.57
	.01	12.7	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.54	6.47
8	.25	1.54	1.66	1.67	1.66	1.66	1.65	1.64	1.64	1.63	1.63	1.63	1.62
	.10	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56	2.54	2.52	2.50
	.05	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.31	3.28
	.01	11.3	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.73	5.67
9	.25	1.51	1.62	1.63	1.63	1.62	1.61	1.60	1.60	1.59	1.59	1.58	1.58
	.10	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44	2.42	2.40	2.38
	.05	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.10	3.07
	.01	10.6	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.18	5.11

Sumber: Gujarati, Damodar N., Basic Econometrics, Mc Graw - Hill Book Co, Singapore, 1988 (penjelasannya diubah sesuai kebiasaan)

TABLE VIII

HARGA-HARGA :  $t_{\alpha}$  (q table)

tk	t.100	t.080	t.025	t.010	t.005	tk
1	3.078	6.314	12.706	31.821	63.657	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.778	3.747	4.604	4
5	1.478	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.418	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.308	2.896	3.355	8
9	1.383	1.833	2.260	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.168	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15
16	1.337	1.746	2.120	2.583	2.921	16
17	1.333	1.740	2.110	2.567	2.898	17
18	1.333	1.734	2.101	2.552	2.878	18
19	1.328	1.729	2.093	2.639	2.861	19
20	1.325	1.725	2.086	2.528	2.845	20
21	1.323	1.721	2.080	2.518	2.851	21
22	1.321	1.717	2.074	2.508	2.819	22
23	1.319	1.714	2.069	2.500	2.807	23
24	1.318	1.711	2.064	2.492	2.797	24
25	1.316	1.708	2.060	2.485	2.787	25
26	1.315	1.706	2.042	2.457	2.779	26
27	1.314	1.703	2.052	2.473	2.771	27
28	1.131	1.701	2.048	2.467	2.763	28
29	1.311	1.699	2.045	2.462	2.758	29
30	1.310	1.697	2.042	2.457	2.750	30
40	1.303	1.684	2.021	2.423	2.704	40
60	1.296	1.671	2.000	2.390	2.660	60
120	1.289	1.658	1.980	2.358	2.617	120
inf	1.382	1.645	1.960	2.326	2.576	inf

$t(8x; 10) = 1.729$   
 $t(1x; 14) = 2.624$



## QUESTIONNAIRE

**Tick (✓) Yes or No**

**Topic : Banking**

1. There are two kinds of account namely, savings account and current account  
☐ Yes ☐ No
2. You can earn interest on a current account.  
☐ Yes ☐ No
3. Banks lend money to depositors who need capital.  
☐ Yes ☐ No
4. The main profits of a bank comes from lending money at a fixed rate of interest.  
☐ Yes ☐ No
5. Money is usually described as “liquidity” of money.  
☐ Yes ☐ No
6. Are you familiar with this topic?  
☐ Yes ☐ No
7. If you are familiar, where do you get the knowledge about the topic?  
☐ Text book ☐ Magazine  
☐ Newspaper ☐ Others .....

## QUESTIONNAIRE

**Tick (✓) Yes or No**

**Topic: Electricity**

1. With a light turned off no current will flow but there will be voltage at the switch

☐ Yes

☐ No

2. Plastic or vinyl are often used as conductors.

☐ Yes

☐ No

3. Voltage can be created by a battery

☐ Yes

☐ No

4. When a switch is turned on, voltage will prevent current from flowing.

☐ Yes

☐ No

5. Electricity is made of electrons.

☐ Yes

☐ No

6. Are you familiar with this topic?

☐ Yes

☐ No

7. If you are familiar, where do you get the knowledge about this topic?

☐ Text book

☐ Magazine

☐ Newspaper

☐ Others.....

## **ELECTRICITY : THE FORCE THAT TRANSFORMED THE WORLD**

In order to talk about electricity, it is necessary to talk about the atom. The idea of the "atom" has along history, one extending back to about 600 BC and the time of the ancient Greeks. They believed that all matter was made up of atoms. The word "atom", in fact, comes from the Greek word "atmos", which means "invisible". It was not until 1897 that it was discovered that the atom is not indivisible but is composed of even smaller particles. Among these particles is one called electron.

Electrons orbit around the center or nucleus of the atom, much as the planets in the solar system orbit around the sun. Electrons are closer to the nucleus are held more tightly than those in the outer orbits. It is the electrons in the outermost orbit of certain kinds of atoms that can be made to flow as electric current.

Electrons flow easily through certain kinds of materials called "conductors". Many metals, such as silver, copper, gold, and aluminum, are good conductors. Good conductors are used in electric circuits to provide a path for the current.

Other substances provide strong resistance to the flow of current. These substances are called "insulators", which are used to confine a current to the desired path. Substances, such as hard rubber, glass, wax, and certain kinds of plastic, are good insulators.

The pressure that makes electrons flow along wires is called "voltage". Voltage may be generated by a generator at a power plant or by an electric battery. When you turn on a light or an electric appliance, electrons are drawn from a generator at a power plant. When you turn the light off, there will be electric pressure or voltage built up at the switch, but no current will flow. It is somewhat similar to the way a water system works.

### ***Answer these questions.***

1. What is electron?
2. What is the similar between planet and electron?
3. How the electron can produce electric current?
4. What are the differences between insulator and conductor?
5. Choose the things below, which ones are good conductors  
glass, pocelain cup, mercury in thermometer, and wool materials
6. Why plastic or vinyl cannot be a good conductor?
7. How does the electricity work in lightening the lamp?
8. How many amperes is measured in a electric current if the power is 110W and the voltage is 220V?

## **BANKING**

Banks are closely concerned with the flow of money into and out of the economic. They often co-operate with governments in efforts to stabilize economies and to prevent inflation. They are specialists in the business of providing capital, and in allocating funds on credit. Banks originated as places to which people took their valuables for safe keeping, but today the great banks of the world have many functions in addition to acting as guardians of valuable private possessions.

Banks normally receive money from their customers in two distinct forms: on current account, and on deposit account. With a current account, a customer can issue personal cheques. No interest is paid by the bank on this type of account. With a deposit account, however, the customer undertakes to leave his money in the bank for a minimum specified period of time. Interest is paid on this money.

The bank in turn lends the deposited money to customers who need capital. This activity earns interest for the bank, this interest is almost always at a higher rate than any interest which the bank pays to its depositors. In this way the bank makes its main profits.

We can say that the primary function of a bank today is to act as an intermediary between depositors who wish to obtain capital. The bank is a reservoir of loanable money, with streams of money flowing in and out. For this reason, economists and financiers often talk of money being "liquid", or the "liquidity" of money. Many small sums which might not otherwise be used as capital are rendered useful simply because the bank acts as a reservoir.

The system of banking rests upon a basis of trust. Innumerable acts of trust build up the system of which bankers, depositors and borrowers are part. They all agree to behave in certain predictable ways in relation to each other, and in relation to the rapid fluctuations of credit and debit, consequently business can be done and cheques can be written without any legal tender visibly changing hands.

*Answer these questions.*

1. In what way do banks co-operate with governments?
2. What was the original function of a bank?
3. What are the differences between current account and deposit account?
4. What does the customer agree to do when he opens a deposit account?
5. How does the bank makes its main profit?
6. Why do financiers often talk of the "liquidity" of money?
7. Do you know what facilities do a bank give to its customer?
8. Budi saved his money in a bank Rp. 1.000.000,-. Then, the bank gave him the interest of 12% per year. Than 3 months later, he took all of his money. How much is his money now?