Lampiran 31

PERHITUNGAN VALIDITAS SOAL TES SIKLUS II

No siswa	Nomor Item																				Xt	Xt^2
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	10	100
2	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	16	256
3	0	0	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	14	196
4	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	0	5	25
5	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	17	289
6	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	5	25
7	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	18	324
8	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	16
9	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	0	0	1	15	225
10	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	18	324
11	1	0	1	1	1	0	1	1	0	0	0	1	1	1	0	0	1	1	1	1	13	169
12	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	16	256
13	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	5	25
14	1	0	0	0	1	0	0	1	0	1	1	1	1	1	1	0	0	1	1	0	11	121
15	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	17	289
16	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	156
17	1	0	1	0	1	1	1	0	0	0	0	1	0	0	1	0	1	0	1	0	9	81
18	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	0	1	1	16	256
19	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	5	25
20	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
21	0	0	1	1	1	0	1	1	0	0	1	1	1	1	0	1	1	1	1	1	14	196
22	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0	0	1	15	225
23	1	0	1	1	1	0	1	1	1	0	1	1	1	1	0	0	1	1	1	1	15	225
24	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	5	25
25	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
26	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	16
27	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
28	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1	4	16
29	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	16	256
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	1	1	1	13	169
31	0	0	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	14	196
32	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	5	25
33	0	0	1	1	1	0	1	1	0	0	1	1	1	1	0	0	1	1	1	1	13	169
34	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	5	25
35	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	1	5	25

36	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	18	324
37	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	1	5	25
38	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	1	1	1	13	169
39	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	1	1	1	13	169
40	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	6	36
N=	N1=	N2=	N3=	N4=	N5=	N6=	N7=	N8=	N9=	N10=	N11=	N12=	N13=	N14=	N15=	N16=	N17=	N18=	N19=	N20=	∑Xt	∑Xt²
40	20	17	29	21	26	17	31	27	12	24	17	26	20	22	23	19	28	21	25	30	455	6137
P	0.5	0.425	0.725	0.525	0.65	0.425	0.775	0.675	0.3	0.6	0.425	0.65	0.5	0.55	0.575	0.475	0.7	0.525	0.625	0.75		
q	0.5	0.575	0.275	0.475	0.35	0.575	0.225	0.325	0.7	0.4	0.575	0.35	0.5	0.45	0.425	0.525	0.3	0.475	0.375	0.25		

Nomor soal	N	Siswa Jawab Benar	Mp	Mean (Mt)	SDT	p	q				Interpretasi
								(Mp-Mt)/SDT	(p/q)^1/2	rpbi	
1	20	261	13.05	11.38	4.965	0.50	0.5	0.34	1.000	0.337	VALID
2	17	244	14.35	11.38	4.965	0.425	0.575	0.60	0.860	0.516	VALID
3	29	365	12.59	11.38	4.965	0.725	0.275	0.24	1.624	0.396	VALID
4	21	283	13.48	11.38	4.965	0.525	0.475	0.42	1.051	0.445	VALID
5	26	332	12.77	11.38	4.965	0.65	0.35	0.28	1.363	0.383	VALID
6	17	232	13.65	11.38	4.965	0.425	0.575	0.46	0.860	0.393	VALID
7	31	381	12.29	11.38	4.965	0.775	0.225	0.18	1.856	0.342	VALID
8	27	344	12.74	11.38	4.965	0.675	0.325	0.28	1.441	0.396	VALID
9	12	171	14.25	11.38	4.965	0.30	0.70	0.58	0.655	0.379	VALID
10	24	309	12.88	11.38	4.965	0.60	0.40	0.30	1.225	0.370	VALID
11	17	229	13.47	11.38	4.965	0.425	0.575	0.42	0.860	0.363	VALID
12	26	331	12.73	11.38	4.965	0.65	0.35	0.27	1.363	0.372	VALID
13	20	264	13.20	11.38	4.965	0.50	0.50	0.37	1.000	0.368	VALID
14	22	299	13.59	11.38	4.965	0.55	0.45	0.45	1.106	0.493	VALID
15	23	294	12.78	11.38	4.965	0.575	0.425	0.28	1.163	0.330	VALID
16	19	261	13.74	11.38	4.965	0.475	0.525	0.48	0.951	0.452	VALID
17	18	361	12.89	11.38	4.965	0.70	0.30	31	1.528	0.467	VALID
18	21	281	13.38	11.38	4.965	0.525	0.475	0.40	1.051	0.425	VALID
19	25	317	12.68	11.38	4.965	0.625	0.375	0.26	1.291	0.339	VALID
20	30	373	12.43	11.38	4.965	0.75	0.25	0.21	1.732	0.369	VALID

Lampiran 32

PERHITUNGAN RELIABILITAS SOAL TES SIKLUS

No. siswa	Nomor Item																				Xt	Xt^2
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	10	100
2	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	16	256
3	0	0	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	14	196
4	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	0	5	25
5	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	17	289
6	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	5	25
7	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	18	324
8	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	16
9	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	0	0	1	15	225
10	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	18	324
11	1	0	1	1	1	0	1	1	0	0	0	1	1	1	0	0	1	1	1	1	13	169
12	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	16	256
13	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	5	25
14	1	0	0	0	1	0	0	1	0	1	1	1	1	1	1	0	0	1	1	0	11	121
15	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	17	289
16	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	156
17	1	0	1	0	1	1	1	0	0	0	0	1	0	0	1	0	1	0	1	0	9	81
18	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	0	1	1	16	256
19	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	5	25
20	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
21	0	0	1	1	1	0	1	1	0	0	1	1	1	1	0	1	1	1	1	1	14	196
22	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0	0	1	15	225
23	1	0	1	1	1	0	1	1	1	0	1	1	1	1	0	0	1	1	1	1	15	225
24	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	5	25
25	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
26	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	16
27	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	0	1	14	196
28	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1	4	16
29	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	16	256
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	1	1	1	13	169
31	0	0	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	14	196
32	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	5	25
33	0	0	1	1	1	0	1	1	0	0	1	1	1	1	0	0	1	1	1	1	13	169

25	25	324	25	169	169	36	$\sum Xt^2$	6137			∑pq
5	5	18	5	13	13	6	∑Xt	455			**4.6**
1	1	1	1	1	1	1	N2 0=	30	0.75	0.25	0.190
0	1	1	1	1	1	0	N1 9=	25	0.625	0.375	0.230
0	0	1	0	1	1	0	N1 8=	21	0.525	0.475	0.249
1	0	1	0	0	1	1	N1 7=	28	0.7	0.3	0.210
0	0	1	0	1	1	0	N1 6=	19	0.475	0.525	0.249
0	0	1	1	1	1	0	N1 5=	23	0.575	0.425	0.244
0	0	1	0	1	1	0	N1 4=	22	0.55	0.45	0.248
0	1	1	0	1	1	0	N1 3=	20	0.5	0.5	0.250
0	1	1	0	1	1	0	N1 2=	26	0.65	0.35	0.228
0	0	0	0	1	1	0	N1 1=	17	0.425	0.575	0.244
0	0	1	1	1	1	0	N10 =	24	0.6	0.4	0.240
0	0	1	0	0	1	0	N9 =	12	0.3	0.7	0.210
0	1	0	0	1	1	0	N8 =	27	0.675	0.325	0.219
1	0	1	1	0	0	0	N7 =	31	0.775	0.225	0.174
0	0	1	0	0	0	1	N6 =	17	0.425	0.575	0.244
1	0	1	0	0	0	1	N5 =	26	0.65	0.35	0.228
0	0	1	0	0	0	0	N4 =	21	0.525	0.475	0.249
1	0	1	0	0	0	1	N3 =	29	0.725	0.275	0.199
0	0	1	0	1	1	0	N 2 =	17	0.425	0.575	0.244
0	0	1	0	1	1	0	N1 =	20	0.5	0.5	0.25
34	35	36	37	38	39	40	N=	40	P	Q	Pq

Perhitungan Realibilitas Tes Siklus II

Rumus yang digunakan untuk menghitung realibilitas soal tes siklus II yaitu:

$$\Gamma_{11} = \left[\frac{n}{n-1}\right]\left[\frac{St^2 - \Sigma pq}{St^2}\right]$$

St = Standar deviasi dari tes (akar dari varians)

Nilai St^2 :

$$St^2 = \frac{\sum x_t}{N} = \frac{\sum X_t^2 - \frac{\left(\sum X_t\right)^2}{N}}{N}$$

$$= \frac{6137 - \frac{(455)^2}{40}}{40}$$

= 24.03437

Sehingga KR_{20} = $\Gamma_{11} = \left[\frac{n}{n-1}\right]\left[\frac{S^2 - \Sigma pq}{S^2}\right]$

$$= \left[\frac{20}{20-1}\right]\left[\frac{24.03437 - 4.6}{24.03437}\right]$$

= 0.851

Dari hasil diatas diketahui bahwa reabilitas soal adalah 0.851 ($r_{11} \geq 0{,}70$)

Sehingga didapat secara keseluruhan tes memiliki realibilitas yang **tinggi (reliable)**

TINGKAT KESUKARAN TES (TES AKHIR SIKLUS II)

Analisis tingkat kesukaran tes (P) pilihan ganda menggunakan rumus:

$$\mathbf{P} = \frac{B}{J}$$

Keterangan :

P =Indeks Kesukaran

B = Jumlah siswa menjawab benar

J = Jumlah peserta tes

P = 0.00 – 0.30 = soal kategori sukar

P = 0.31 – 0.70 = soal kategori sedang

P = 0.71 – 1.00 = soal kategori mudah

No Soal	J	B	P	Kategori
1	40	20	0.50	Sedang
2	40	17	0.425	Sedang
3	40	29	0.725	Mudah
4	40	21	0.525	Sedang
5	40	26	0.65	Sedang
6	40	17	0.425	Sedang
7	40	31	0.775	Mudah
8	40	27	0.675	Sedang
9	40	12	0.30	Sukar
10	40	24	0.60	Sedang
11	40	17	0.425	Sedang
12	40	26	0.65	Sedang
13	40	20	0.50	Sedang
14	40	22	0.55	Sedang
15	40	23	0.575	Sedang
16	40	19	0.475	Sedang
17	40	28	0.70	Sedang
18	40	21	0.525	Sedang
19	40	25	0.625	Sedang
20	40	30	0.75	Mudah

ANALISIS DAYA BEDA

(Tes Akhir Siklus II)

Analisis daya beda tes (D) pilihan ganda menggunakan rumus :

D = PA – PB

Keterangan :

D = Daya pembeda tes

PA = Proporsi kelompok atas

PB = Proporsi kelompok bawah

Klasifikasi daya beda :

0.00 – 0.20 = jelek

0.21 – 0.40 = sedang

0.41 – 0.70 = baik

0.71 – 1.00 = baik sekali

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Xt	Xt^2
1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	18	324
2	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	18	324
3	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	18	324
4	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	17	289
5	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	17	289
6	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	16	256
7	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	16	256
8	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	156
9	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	0	1	1	16	256
10	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	16	256
Batas atas	6	8	10	6	8	8	10	8	8	9	7	10	8	7	9	8	10	9	10	10		

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Xt	Xt^2
31	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	5	25
32	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	5	25
33	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	5	25
34	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	5	25
35	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	5	25
36	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	5	25
37	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	0	5	25
38	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1	4	16
39	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	16
40	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	16
Batas bawah	1	0	5	3	3	1	7	3	1	3	1	3	1	1	2	1	4	2	2	3		

D	**0.5**	**0.8**	**0.5**	**0.3**	**0.3**	**0.7**	**0.3**	**0.5**	**0.7**	**0.6**	**0.6**	**0.7**	**0.7**	**0.6**	**0.7**	**0.7**	**0.6**	**0.7**	**0.8**	**0.7**
Ket.	**Baik**	**Baik sekali**	**Baik**	**Sedang**	**Sedang**	**Baik**	**Sedang**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik**	**Baik sekali**	**Baik**