

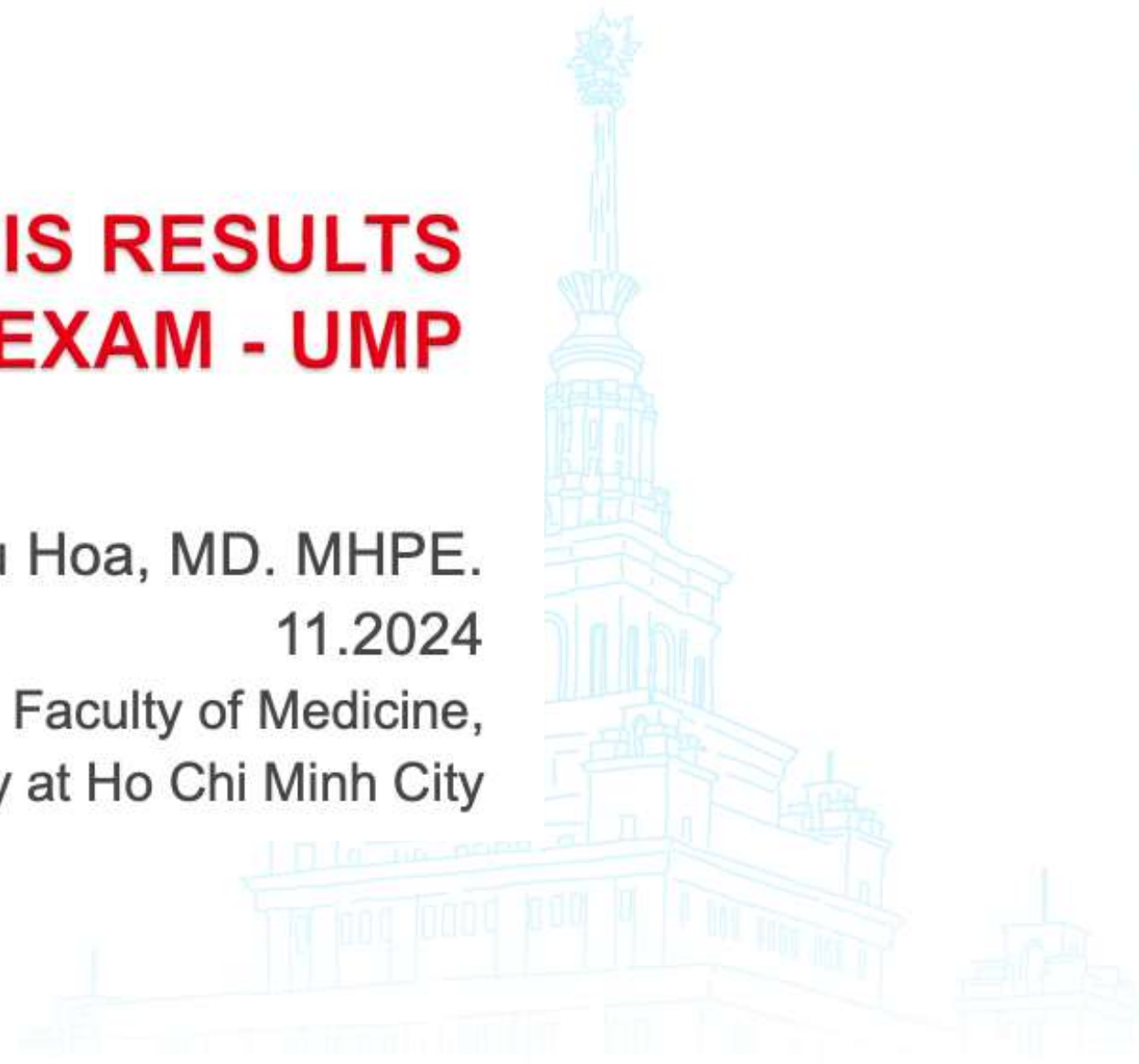
ITEM ANALYSIS RESULTS MEDICAL GRADUATION EXAM - UMP

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Process for graduation exam

1. Construct test blueprint
Faculty → Department
2. Department assign lecturers to write items
3. Review items in committees
4. Exam administration
5. Item analysis
6. Standard setting



Exam administration

- ▶ **2 sessions (27.6,28.6), each session 150 items - 180 minutes**
- ▶ **Student numbers: 388 (374 Y18 + 14 Y16 Y17)**
- ▶ **3 computer rooms**



Item analysis CTT

- ▶ **Item analysis according to CTT (Item Difficulty index, Item Discrimination Index, Rpb)**
- ▶ **Require departments to review and explain correct answers to some doubtful questions**

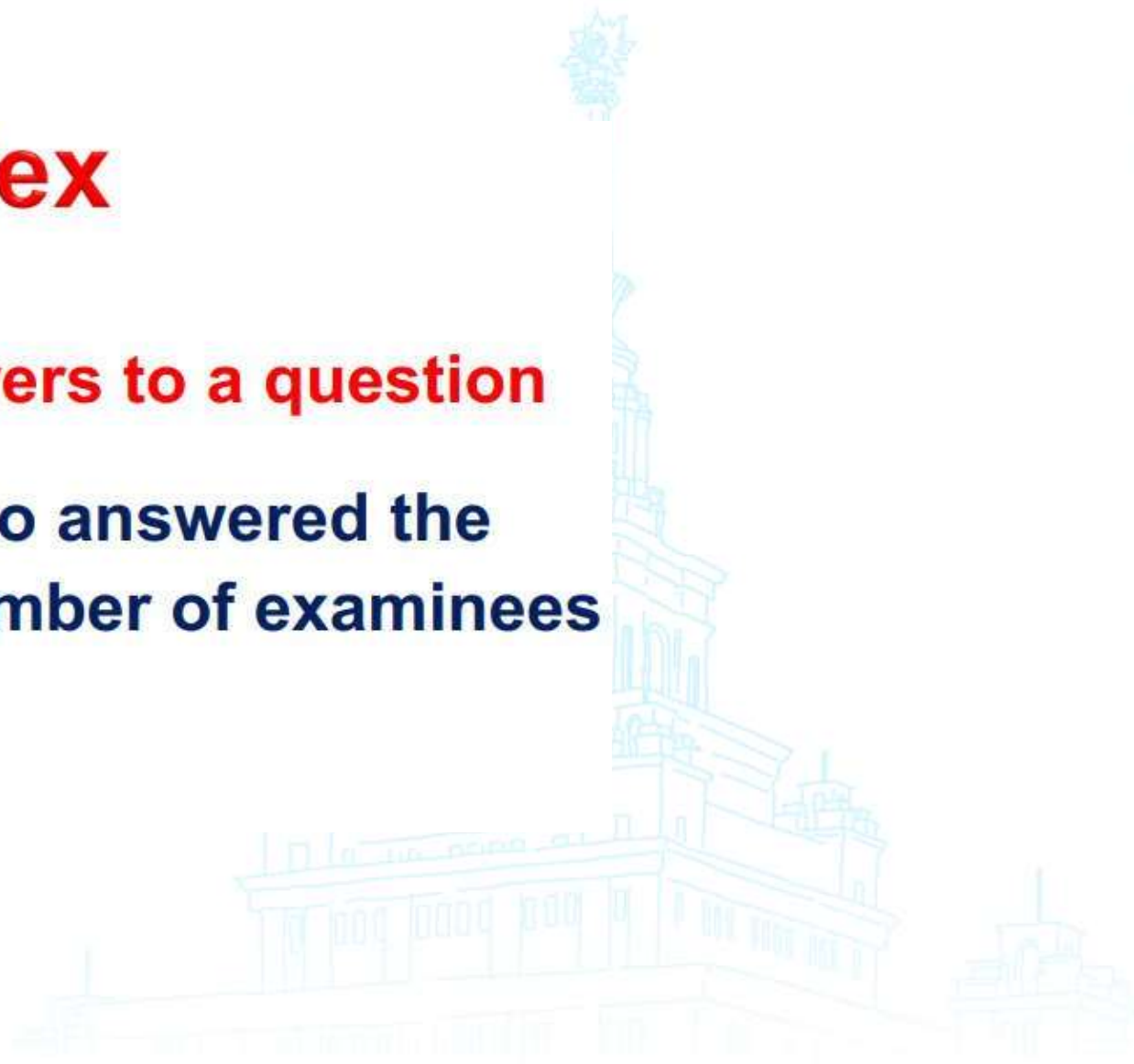


Item Difficulty index

percentage of correct answers to a question

= Number of examinees who answered the question correctly/Total number of examinees

$$P_i = R_i/N$$



Item Discrimination Index

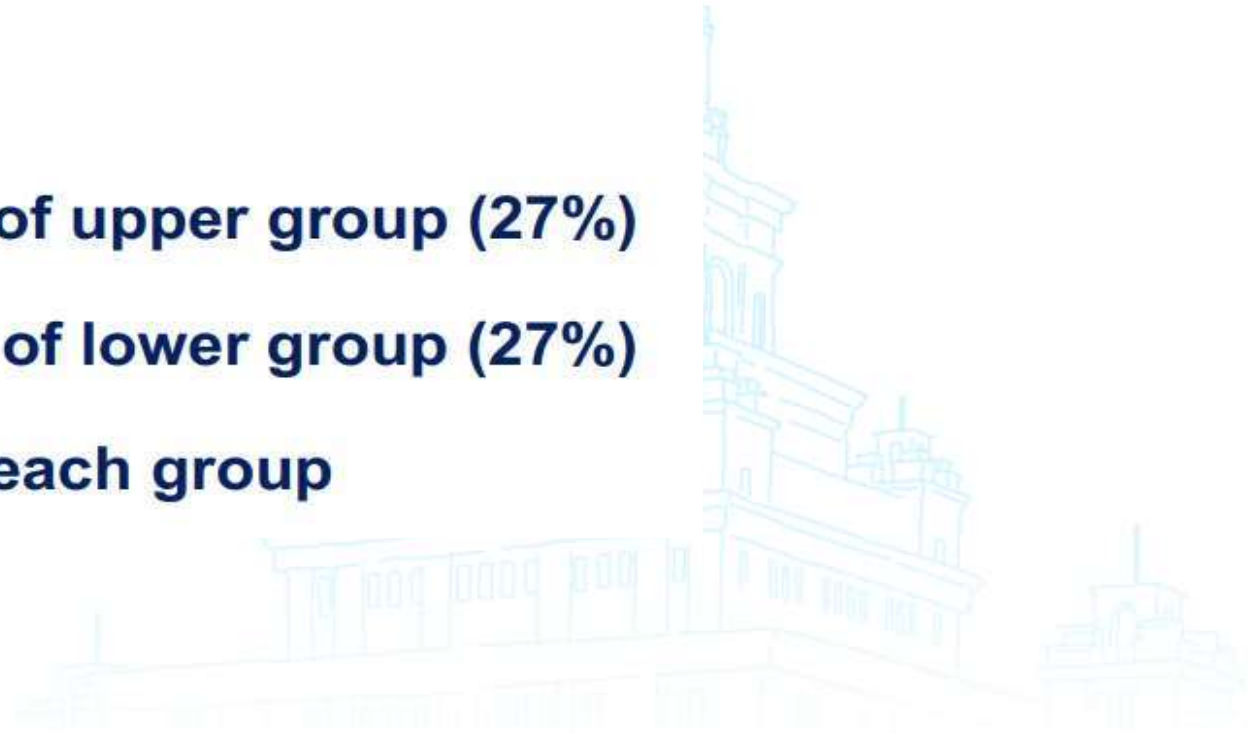
is the ability of the question to differentiate between students who are high performing and those who are not

$$D = (U-L)/n$$

H: number of correct answers of upper group (27%)

L: number of correct answers of lower group (27%)

n: total number of students in each group



R_{pbi} (point bi-serial correlation coefficient, or item-total correlation)

- The point-biserial coefficient is a correlation between scores on a specific item and the total test score. It is called an **item-total correlation**

$$R_{pbi} = \frac{\bar{x}_r - \bar{x}_w}{S_t} \sqrt{p(1-p)}$$

- R_{pbi}: the point bi-serial correlation coefficient
- X_r: mean score of students answering the item correctly
- X_w: mean score of students answering the item incorrectly
- S_t: standard deviation for the entire test
- P: proportion of students answering the item correctly

(Newble, 1983)

(Tavakol & Dennick, 2011)

Discrimination index

Rpbi

->= 0.40: Very good

-0.30 – 0.39: Good, but could
make better, little revision

-0.20 – 0.29: marginal, need
revision

-<= 0.19: poor, should be
eliminated or completely
revised

-0.40 – 0.70: Very Good

-0.30 – 0.39: Good

-0.20 – 0.29: Marginal

-<= 0.19: Poor

Source: Penn, 2009; McGahee and Ball, 2009



Câu 102:

Độ khó :0.56

Độ phân cách :-0.27

Phân cách kém. Đáp án sai?

Hệ số tương quan câu-bài:
 $r_{pbis}:-0.236, p=2.756E-6^*$

Lựa chọn	A*	B	C	D	M
Tất cả	217	145	20	6	0
Tỉ lệ	55.9%	37.4%	5.2%	1.5% *	0%
ĐiểmTB(%)	59.4	63.6	56.5	70.1	
Nhóm cao	45	54	1	5	0
Nhóm thấp	73	24	8	0	0
Độ ph.cách	-0.267	0.286	-0.067	0.048	0.000
r-pbis	-0.236	0.192	-0.133	0.119	0.000
p value	0.000	0.000	0.009	0.019	1.000

Afer changing correct answer

Câu 102:

Độ khó :0.37

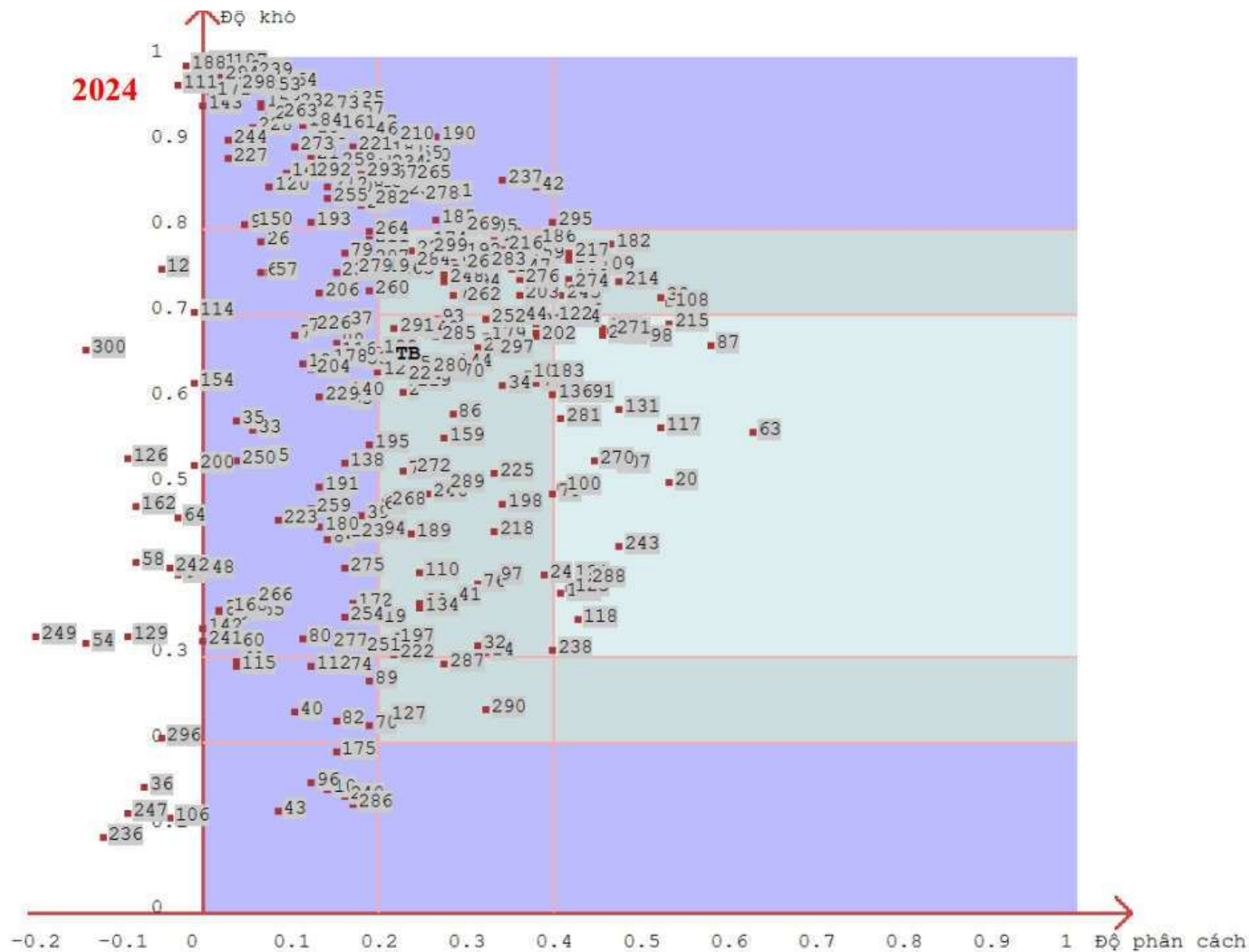
Độ phân cách :0.41

Tốt.

Hệ số tương quan câu-bài:

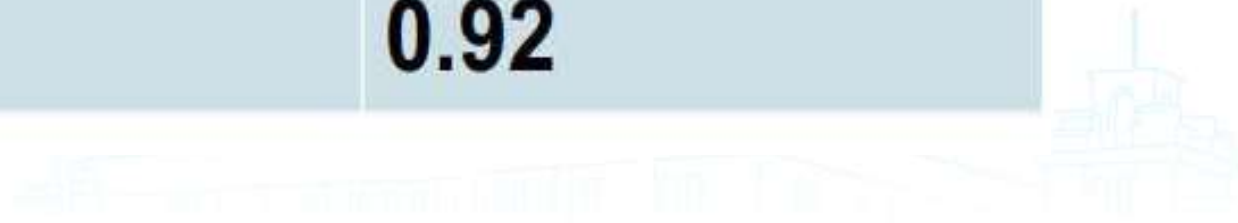
$r_{pbis}:0.265, p=1.325E-7^*$

Lựa chọn	A	B*	C	D	M
Tất cả	217	145	20	6	0
Tỉ lệ	55.9%	37.4%	5.2%	1.5% *	0%
ĐiểmTB(%)	62.9	67.8	60.4	71.2	
Nhóm cao	38	63	1	3	0
Nhóm thấp	75	20	10	0	0
Độ ph.cách	-0.352	0.410	-0.086	0.029	0.000
r-pbis	-0.264	0.265	-0.127	0.091	0.000
p value	0.000	0.000	0.012	0.074	1.000



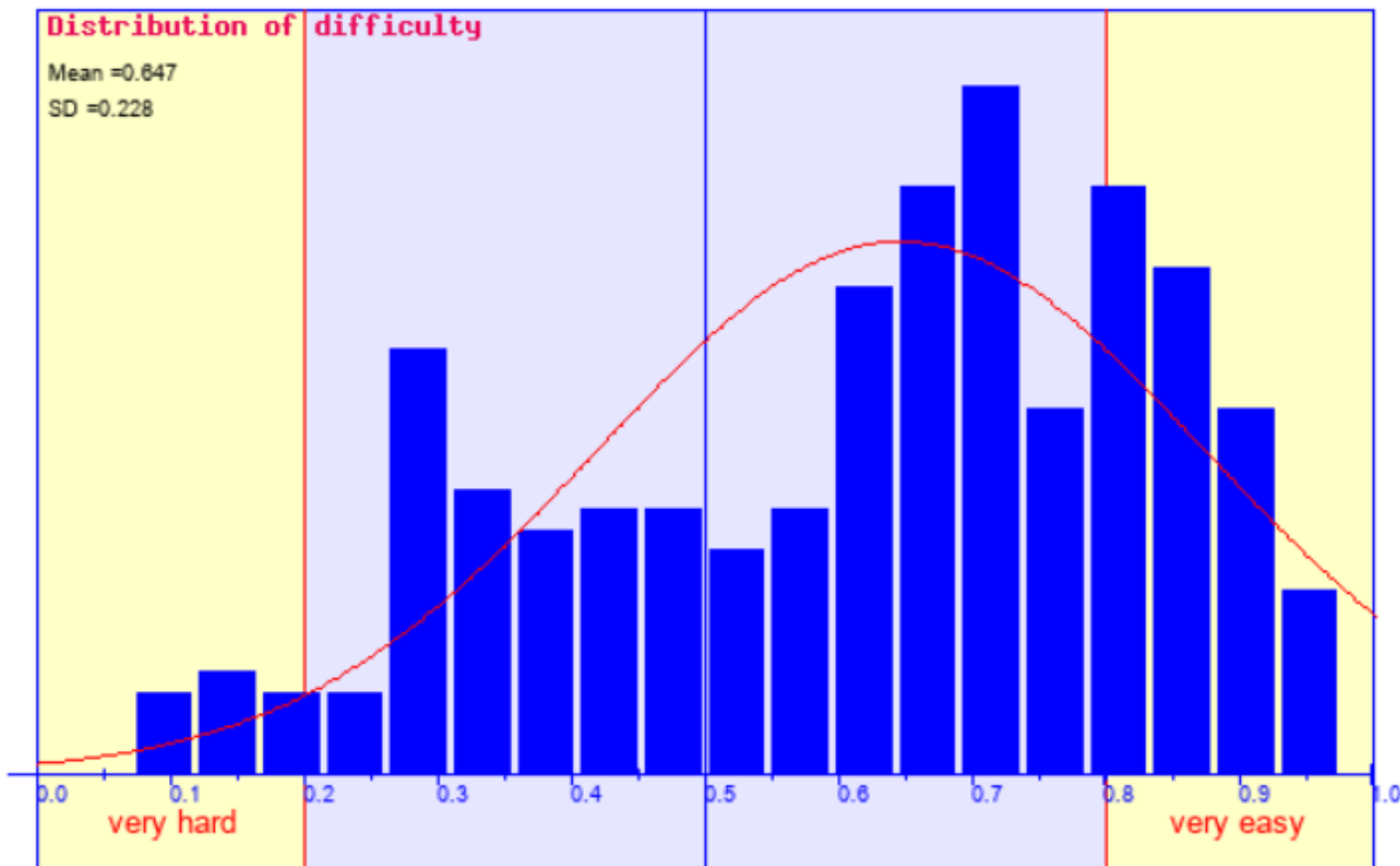
MCQ test analysis

MCQ Test	300 items
Mean	194.2
SD	25.36
Average difficulty index	0.647
Average discrimination index	0.207
Reliability (KR-20)	0.92



PHÂN BỐ ĐỘ KHÓ

Stt	Độ khó	Số câu	Tỉ lệ (%)	Tích lũy (%)	Mức độ	Câu	Phân cách trung bình	Gom nhóm (%)
1	0-0.05	0	0	0	Quá khó			3.3
2	0.05-0.1	1	0.3	0.3	Quá khó	236	-0.11	
3	0.1-0.15	7	2.3	2.7	Quá khó	10 36 43 106 240 247 286	0.05	
4	0.15-0.2	2	0.7	3.3	Quá khó	96 175	0.14	
5	0.2-0.25	6	2	5.3	Khó	40 70 82 127 290 296	0.16	67.7
6	0.25-0.3	8	2.7	8	Khó	61 62 74 89 112 115 261 287	0.17	
7	0.3-0.35	19	6.3	14.3	Trung bình	14 19 30 32 54 60 80 95 118 129 142 197 222 238 241 249 251 254 277	0.13	
8	0.35-0.4	18	6	20.3	Trung bình	24 41 56 67 76 90 97 102 110 121 125 134 148 165 168 172 266 288	0.22	
9	0.4-0.45	9	3	23.3	Trung bình	58 84 94 123 189 218 242 243 275	0.18	
10	0.45-0.5	13	4.3	27.7	Trung bình	39 64 68 78 100 162 180 191 198 223 246 259 268	0.18	
11	0.5-0.55	13	4.3	32	Trung bình	20 71 85 107 126 138 195 200 225 250 270 272 289	0.22	
12	0.55-0.6	9	3	35	Trung bình	33 35 55 63 86 117 131 159 281	0.32	
13	0.6-0.65	21	7	42	Trung bình	2 18 34 53 77 91 101 119 124 136 140 144 154 156 170 178 183 204 224 229 280	0.24	
14	0.65-0.7	31	10.3	52.3	Trung bình	1 7 27 31 37 44 49 73 87 88 93 98 104 116 122 141 146 149 169 179 199 202 209 215 226 252 271 285 291 297 300	0.31	
15	0.7-0.75	24	8	60.3	Dễ	4 6 25 38 50 57 75 81 99 108 113 114 194 203 205 206 214 230 245 248 260 262 274 276	0.29	
16	0.75-0.8	32	10.7	71	Dễ	5 12 13 23 26 47 59 72 79 105 109 133 147 160 163 174 182 186 192 207 211 213 216 217 219 220 264 267 279 283 284 299	0.27	
17	0.8-0.85	20	6.7	77.7	Quá dễ	11 22 42 83 92 103 120 150 151 177 185 193 208 212 231 255 269 278 282 295	0.19	29
18	0.85-0.9	26	8.7	86.3	Quá dễ	3 9 21 48 69 128 130 139 145 152 155 167 181 196 201 221 227 233 234 237 257 258 265 273 292 293	0.19	
19	0.9-0.95	26	8.7	95	Quá dễ	8 15 16 17 28 29 46 51 52 65 66 135 137 143 153 157 161 173 184 190 210 228 232 244 256 263	0.13	
20	0.95-1	15	5	100	Quá dễ	45 111 132 158 164 166 171 176 187 188 235 239 253 294 298	0.03	



Difficulty index

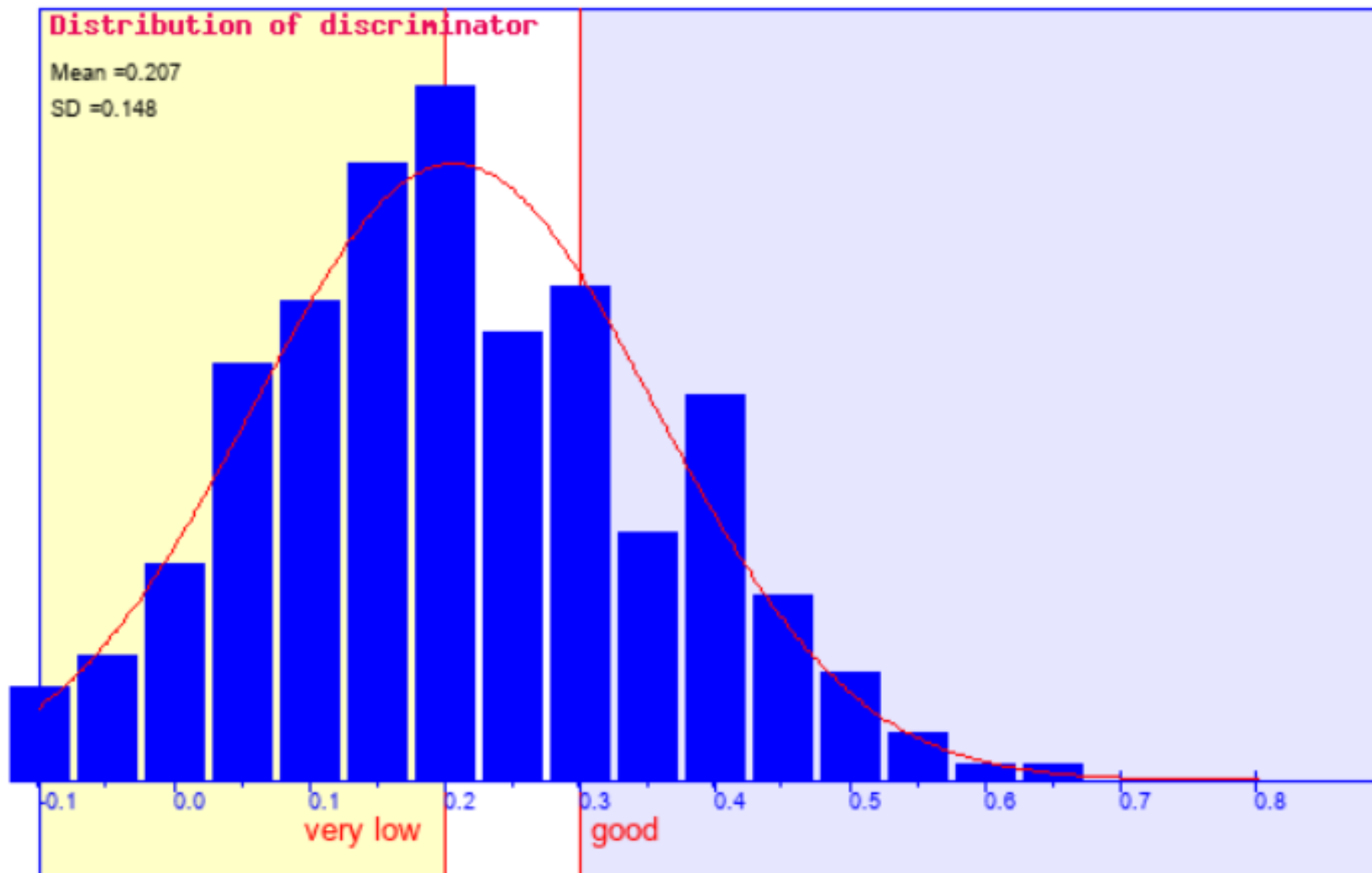
- ▶ **<0.3: 24 (8%)**
- ▶ **0.3-0.7: 133 (44.3%)**
- ▶ **>0.7: 143 (47.6%)**



PHÂN BỐ ĐỘ PHÂN CÁCH

Stt	Độ phân cách	Số câu	Tỉ lệ (%)	Tích lũy (%)	Mức độ	Câu
1	0.95-1	0	0	0	Tốt	
2	0.9-0.95	0	0	0	Tốt	
3	0.85-0.9	0	0	0	Tốt	
4	0.8-0.85	0	0	0	Tốt	
5	0.75-0.8	0	0	0	Tốt	
6	0.7-0.75	0	0	0	Tốt	
7	0.65-0.7	0	0	0	Tốt	
8	0.6-0.65	1	0.3	0.3	Tốt	63
9	0.55-0.6	1	0.3	0.7	Tốt	87
10	0.5-0.55	6	2	2.7	Tốt	20 38 98 108 117 215
11	0.45-0.5	10	3.3	6	Tốt	49 107 131 141 146 182 209 214 243 271
12	0.4-0.45	22	7.3	13.3	Tốt	4 23 78 91 100 102 104 109 113 118 121 122 125 136 217 238 245 270 274 281 288 295
13	0.35-0.4	15	5	18.3	Tốt	24 31 42 44 59 72 77 101 147 169 183 186 202 203 276
14	0.3-0.35	19	6.3	24.7	Tốt	14 27 32 34 47 76 97 105 179 198 213 216 218 225 237 252 283 290 297
15	0.25-0.3	31	10.3	35	Tạm được	1 5 11 13 41 50 61 75 81 86 93 99 144 159 170 174 185 190 192 194 246 248 261 262 267 269 280 285 287 289 299
16	0.2-0.25	45	15	50	Tạm được	2 3 8 9 19 30 48 68 71 83 90 94 110 119 124 127 128 130 134 139 149 155 156 160 163 181 189 196 197 199 201 210 220 222 224 231 233 234 257 265 268 272 278 284 291
17	0.15-0.2	48	16	66	Kém	16 17 22 29 37 39 46 53 55 69 70 74 79 82 88 89 116 123 133 135 138 140 151 152 157 161 172 175 177 195 205 207 208 211 219 221 230 240 251 254 258 260 264 275 279 282 286 293
18	0.1-0.15	35	11.7	77.7	Kém	7 10 15 18 21 25 28 40 51 65 66 73 80 84 96 112 137 167 173 178 180 184 191 193 204 206 212 226 229 232 255 259 273 277 292
19	0.05-0.1	22	7.3	85	Kém	6 26 33 43 52 57 85 103 120 132 145 150 153 164 166 223 228 239 253 256 263 266
20	<0.05	45	15	100	Kém	12 35 36 45 54 56 58 60 62 64 67 92 95 106 111 114 115 126 129 142 143 148 154 158 162 165 168 171 176 187 188 200 227 235 236 241 242 244 247 249 250 294 296 298 300





HISTOGRAM OF DISCRIMINATOR



Discrimination index

- ▶ **<0.2: 150 (50%)**
- ▶ **0.2-<0.3: 76 (25.3%)**
- ▶ **0.3-<0.4: 34 (11.3%)**
- ▶ **>=0.4: 40 (13.3%)**



Poor discrimination index

Discrimination index	N. of item	N. of item $p < 0.3$	N. of item $p 0.3 - 0.7$	N. of item $p > 0.7$	N. of item $p 0.7 - 0.8$	N. of item $p 0.8 - 0.9$	N. of item $p > 0.9$
<0	22	5	13	4	2		2
0-<0.1	45	3	13	29	3	6	20
0.1-<0.2	83	11	27	45	12	17	16
Total	150	19	53	78	17	23	38





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