

## Workshop Part 2: Fundamentals Of Item Analysis for Classroom Assessments

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### Practice Activity:

#### Part 1: Item Difficulty

**Stem:** A 35-year-old woman presents to the emergency department with acute severe abdominal pain radiating to her back, nausea, and vomiting. Laboratory results show elevated serum lipase (750 U/L) and amylase (450 U/L). Her medical history reveals heavy alcohol use.

**Lead-in:** What is the MOST likely diagnosis?

Options:	Response distribution:
A) Acute appendicitis	32 students
B) Acute cholecystitis	45 students
C) Acute pancreatitis* (correct)	38 students
D) Perforated peptic ulcer	35 students

**N = 150 students**

*Instructions:* Given the data above, compute the **item difficulty level (P)** of the given item on the blanks below:

Formula:  $P = (\text{number of students who answered correctly}) / (\text{Total number of students who took the test})$

**Your answers here:**

$$P = 38 / 150$$

$$P = 0.25$$

**Interpretation (encircle your choice below):**

**(EASY ITEM / MEDIUM DIFFICULTY ITEM / DIFFICULT ITEM)**

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### Part 2: Item Discrimination

*Instructions:* Using the same MCQ item above and after rank-ordering the scores of the students from highest to lowest, suppose we found the following response pattern between the **upper 27%** and **lower 27%** (27% of 150 is 40.5~41 students for each group):

Upper group (41 students):	Lower group (41 students):
A) 20 (correct)	A) 4 (correct)
B) 12	B) 15
C) 5	C) 12
D) 4	D) 10

Now, compute the item discrimination index (D) for this item:

Formula:  $D = (\text{Upper Group of students with correct answer} - \text{Lower Group of students with correct answer}) / \text{Total number of students per group}$

Your answers here:

$$D = 20 - 4 / 41$$

$$D = 0.39$$

Interpretation (encircle your choice below):

- EXCELLENT DISCRIMINATION
  - **GOOD DISCRIMINATION**
  - FAIR DISCRIMINATION
  - POOR DISCRIMINATION
  - NEGATIVE DISCRIMINATION
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**Part 3: Distractor Analysis**

*Instructions:* Based on the response pattern distribution for the upper group (27%; 41 students) and the lower group (27%; 41 students), **interpret**

Option	Response Distribution	Upper Group (n=41)	Lower Group (n=41)	Interpretation (Good/Moderate/Poor Distractor): Write in this column
A) Acute appendicitis	32/150	4	6	Poor distractor
B) Acute cholecystitis	45/150	12	15	Moderate (but can be flagged for checking for ambiguity)
<b>C) Acute pancreatitis (Correct)</b>	38/150	20	4	=====
D) Perforated peptic ulcer	35/150	5	16	Good distractor

each of the three distractor options (B, C, D) as being a **Good/Moderate/Poor Distractor**

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### Part 4: Reliability

*Instructions:* Using the point-biserial correlation results below for 7-item test, interpret each of the items on the designated column:

Item	Pearson Correlation	Sig. (2-tailed)	N	Interpretation
Item1	.574**	<.001	40	Excellent
Item2	.456**	.003	40	Excellent
Item3	.370*	.019	40	Good
Item4	.593**	<.001	40	Excellent
Item5	.392*	.012	40	Fair
Item6	.491**	.001	40	Poor
Item7	.382*	.015	40	Good

#### Guide:

rpbi > 0.40: Excellent

rpbi 0.30-0.39: Good

rpbi 0.20-0.29: Fair

rpbi < 0.20: Poor