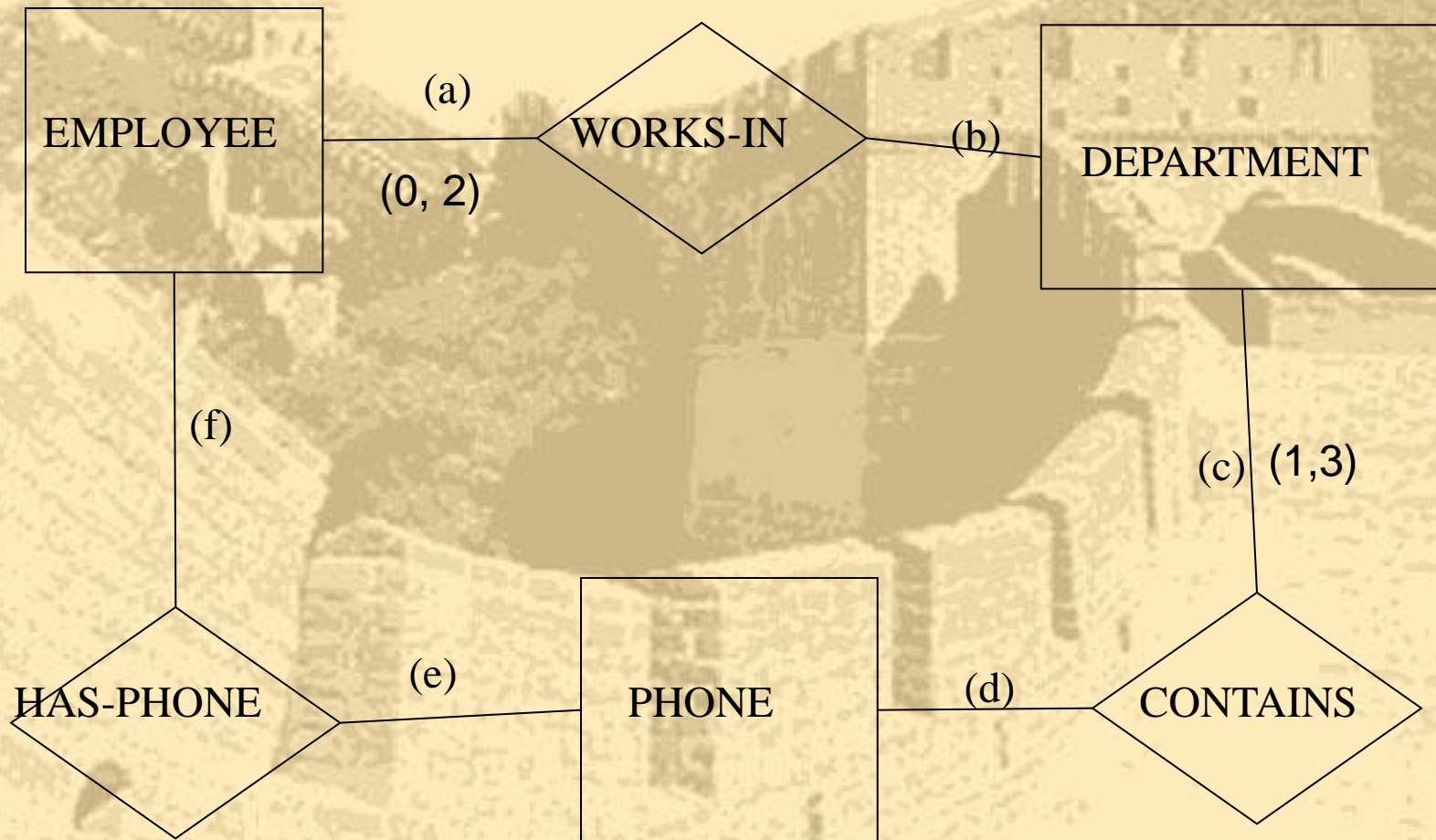


Cardinality

- ⌘ Consider the ER diagram in the following. Assume that an employee may work in up to two departments, but may also not be assigned to any department. Assume that each department must have one and may have up to three phone numbers.
- ⌘ (a)-(f) Supply the min-card and max-card constraints for each relationship on this diagram.
- ⌘ (g) Under what conditions would the relationship HAS-PHONE be redundant in this example.

An office database



Cardinality with assumption

- ⌘ (b) min-max card(1, n)
 - ⌘ If one department has at least one employee and at most n employees.
- ⌘ (d) min-max card(1, 1)
 - ⌘ If one telephone must belong to only one department.
- ⌘ (e) min-max card(0, n)
 - ⌘ If one telephone may not be assigned to any employee, or may be assigned to many employees.
- ⌘ (f) min-max card(0, n)
 - ⌘ If one employee may be assigned to no telephone, or may be assigned to many telephones.

Redundancy

- ⌘ Under what conditions would the relationship HAS-PHONE be redundant.
- ⌘ Ans.
 - If one employee must be assigned to a department and the phone also must be assigned to a department.