(1) A student can take not more than 5 subjects in a semester. The number of students allowed in a subject in a semester is not more than 40. The student – subject relationship is:
(A) 5:40   (B) 40:5
(C) N:5   (D) 40:M
ANS:
B

(2) Which of the following is NOT a basic element of all versions of the E-R model?
(A) Entities
(B) Attributes
(C) Relationships
(D) Primary keys
ANS:
D

(3) The attribute *name* could be structured as a attribute consisting of first name, middle initial, and last name. This type of attribute is called
(A) Simple attribute
(B) Composite attribute
(C) Multivalued attribute
(D) Derived attribute
ANS:
B

(4) Which of the following indicates the minimum number of entities that must be involved in a relationship?
(A) Maximum cardinality
(B) Minimum cardinality
(C) ERD
(D) Keys
ANS:
B

(5) Which of the following is a single valued attribute
(A) Register_number
(B) Address
(C) SUBJECT_TAKEN
(D) Reference
ANS:
A

(6) In a one-to-many relationship, the entity that is on the many side of the relationship is called as
(A) Strong entity

(B) Weak entity
(C) Entity that has optional participation in the relationship
(D) Entity that has mandatory participation in the relationship
ANS:
B

(7)   Describe what attributes represent in an ER model and provide examples of simple, composite, single-valued, multi-valued, and derived attributes.
(Review Question 12.3 in 5th edition/ 11.3 in 4th edition)
ANS:
Attributes represent properties or characteristic of an entity.
Simple attribute – an attribute which is not possible to divide into smaller parts. e.g., firstName
Composite attribute – an attribute which can divide into smaller parts. e.g., address (street, city, zip)
Single-valued attribute – an attribute which can be only one value in the entity e.g., SSN
Multi-valued attribute – an attribute which can be more than one value in the entity e.g., phoneNumber (mobile, home)
Derived attribute – an attribute which is derived from other attribute of the same entity. e.g., age

(8)   Describe how strong and weak entity types differ and provide an example of each.
(Review Question 12.8 in 5th edition/ 11.8 in 4th edition)
ANS:
Strong entity type – an entity type which can be uniquely identified by its own attribute
e.g., Supplier -> Supplier can uniquely identify
Weak entity type – an entity type which cannot be uniquely identified by its own attribute
e.g., ItemPrice[SupplierId, ItemId, Price] -> SupplierId(foreign key) and ItemId as a composite key can identify Price.

(9)   Create an ER diagram for each of the following descriptions:
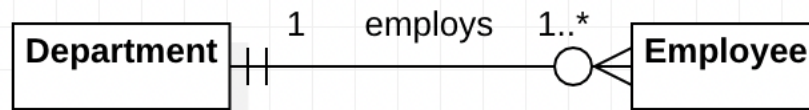(Exercise 12.10 in 5th edition/ 11.10 in 4th edition)
 a.   Each company operates four departments, and each department belongs to one company.
       ANS:
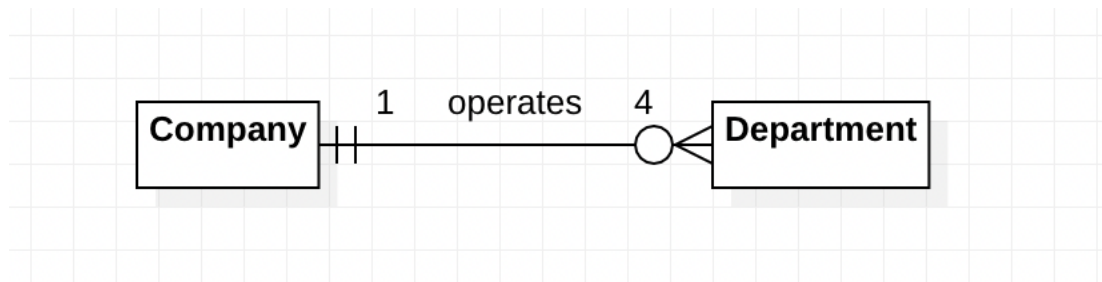
  b.   Each department in part (a) employs one or more employees, and each employee works for one department.
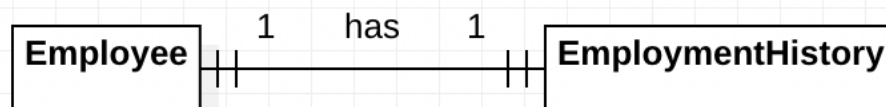   ANS:

Department — 1 — employs — 1..* — Employee

c. Each of the employees in part (b) may or may not have one or more dependants, and each dependant belongs to one employee.
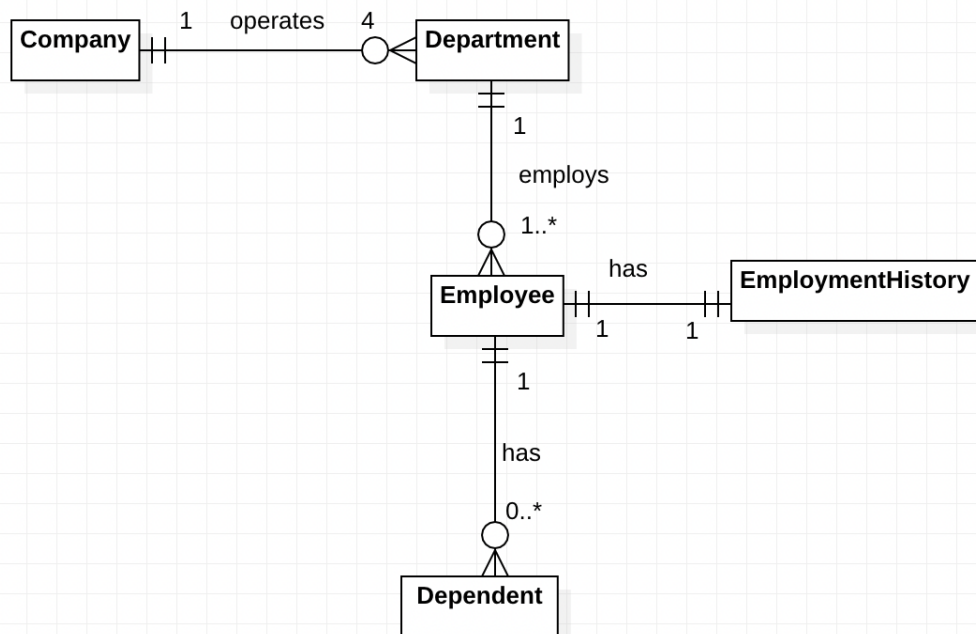ANS:

Employee — 1 — has — 0..* — Dependent
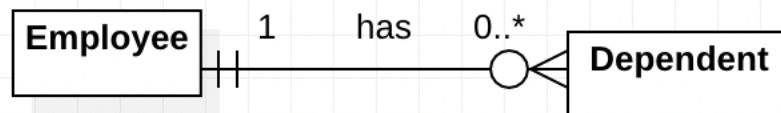
d. Each employee in part (c) may or may not have an employment history.
ANS:

Employee — 1 — has — 1 — EmploymentHistory

e. Represent all the ER diagrams described in (a), (b), (c), and (d) as a single ER diagram.
ANS:

(10) Solve exercise 12.12 from the 5th edition (11.12 from the 4th edition). If time permits, solve from *a-f*. Otherwise, it's ok if you just solve *f*.
ANS: