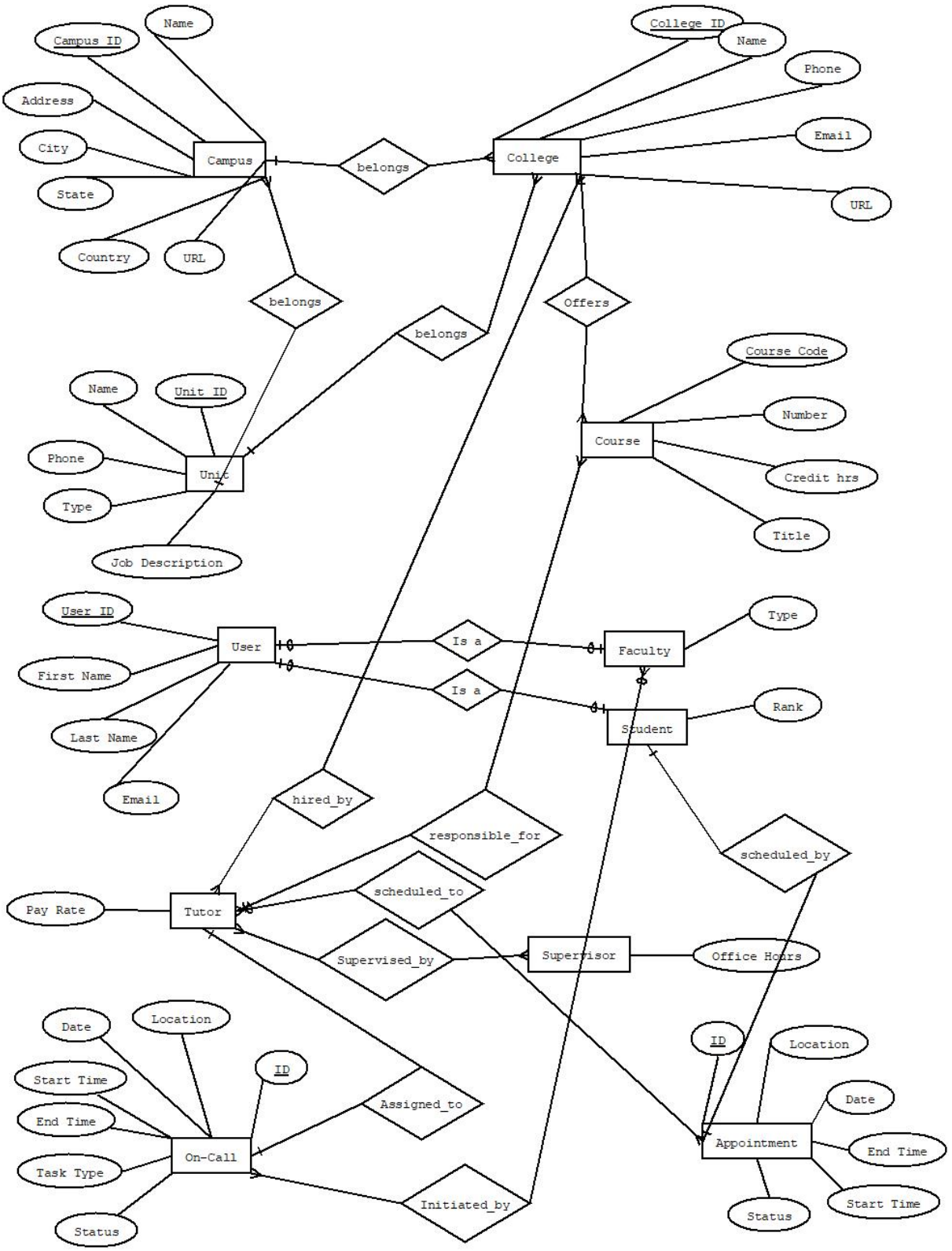
Question 1:


Campus
Campus ID
Name
Address
City
State
Country
URL
belongs
College
College ID
Name
Phone
Email
URL
belongs
belongs
Offers
Unit
Name
Unit ID
Phone
Type
Job Description
Course
Course Code
Number
Credit hrs
Title
User
User ID
First Name
Last Name
Email
Is a
Is a
Faculty
Type
Student
Rank
hired_by
responsible_for
scheduled_by
Tutor
Pay Rate
scheduled_to
Supervised_by
Supervisor
Office Hours
On-Call
Date
Location
ID
Start Time
End Time
Task Type
Status
Assigned_to
Initiated_by
Appointment
ID
Location
Date
End Time
Start Time
Status

Entities:

1. Campus
   - Attributes: ID (Key), Name, Address, City, State, Country, URL

2. College
   - Attributes: ID (Key), Name, Phone, Email, URL
   - Relationship: Belongs to one Campus (Campus, 1..*)

3. Unit
   - Attributes: ID (Key), Name, Phone, Type (academic or non-academic), Job Description (for non-academic)
   - Relationship: Belongs to one Campus (Campus, 1..*)
   - Relationship: Belongs to one College (College, 1..*)

4. Course
   - Attributes: Code (Key), Number (Key), Credit, Title
   - Relationship: Offered by one College (College, 1..*)

5. User
   - Attributes: ID (Key), First Name, Last Name, Email
   - Multivalued Attribute: Phone
   - Relationship: Is a Faculty (Faculty, 0..1)
   - Relationship: Is a Student (Student, 0..1)

6. Faculty
   - Attributes: Rank

7. Student
   - Attributes: Type (undergraduate or graduate)

8. Tutor
   - Attributes: Pay Rate
   - Relationship: Can be responsible for many Courses (Course, 0..*)
   - Relationship: Hired by one or more Colleges (College, *)
   - Relationship: Supervised by one Supervisor (Supervisor, 1)

9. Supervisor
   - Attributes: Office Hours
   - Relationship: Supervises many Tutors (Tutor, *)

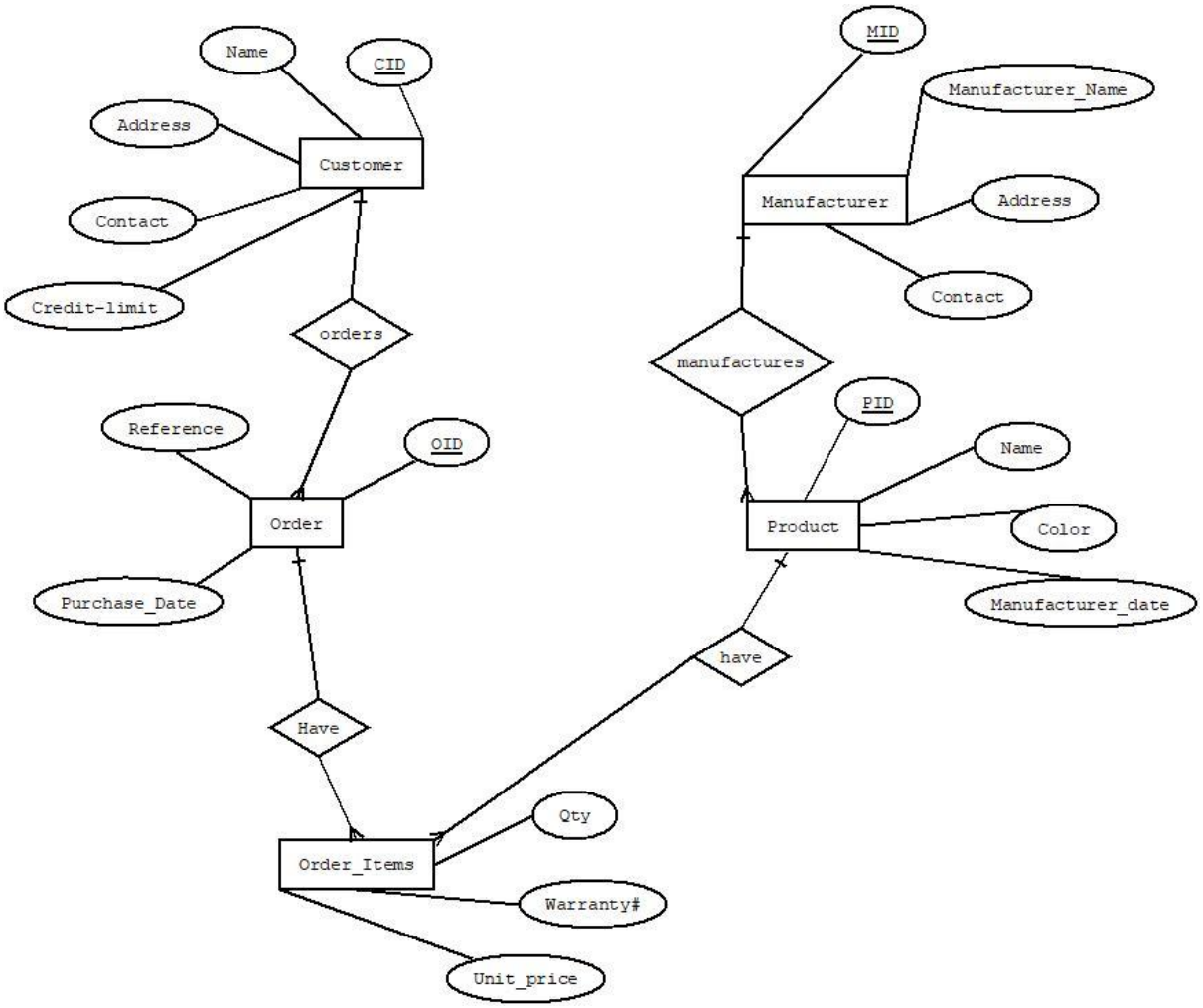
10. On-Call
    - Attributes: ID (Key), Location, Date, Start Time, End Time, Task Type, Status
    - Relationship: Initiated by one Faculty (Faculty, 1)
    - Relationship: Assigned to one Tutor (Tutor, 1)

11. Appointment
    - Attributes: ID (Key), Location, Date, Start Time, End Time, Status
    - Multivalued Attribute: List of Courses
    - Relationship: Scheduled by one Tutor (Tutor, 1)
    - Relationship: Scheduled with one Student (Student, 1)

Now, let's specify the (min, max) constraints for the relationships:

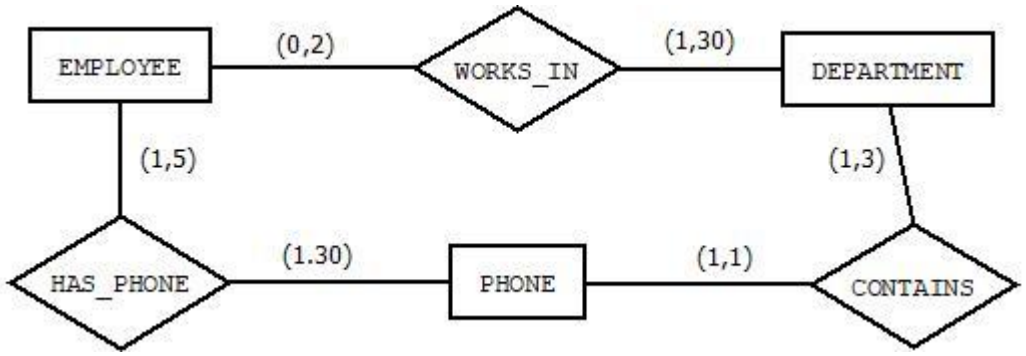
- Campus to College: (1, *)
- Campus to Unit: (1, *)
- College to Unit: (1, *)
- College to Course: (0, *)
- User to Faculty: (0,1)
- User to Student: (0,1)
- Tutor to Course: (0, *)
- Tutor to College: (*, *)
- Supervisor to Tutor: (*, *)
- Faculty to On-Call: (0, *)
- Tutor to On-Call: (1, 1)
- Tutor to Appointment: (0, *)
- Student to Appointment: (1, 1)

Question 2:


Name
CID
Address
Customer
Contact
Credit-limit
orders
Reference
OID
Order
Purchase_Date
Have
MID
Manufacturer_Name
Manufacturer
Address
Contact
manufactures
PID
Name
Product
Color
Manufacturer_date
have
Qty
Order_Items
Warranty#
Unit_price

Question 3:

a)



b) The relationship "HAS PHONE" would be redundant if each employee could have at most one phone, and each phone could be assigned to only one employee. In other words, if the maximum cardinality for both "Employee to Phone" and "Phone to Employee" relationships was 1 (meaning each employee has only one phone and each phone is assigned to only one employee), then the "HAS PHONE" relationship would not be necessary because the direct relationship between employees and phones would already cover the assignment of phones to employees.