

1. Which type of data can be stored in the database?
 - a. Image oriented data
 - b. Text, files containing data
 - c. Data in the form of audio or video
 - d. All of the above
 - e. None of the above

d
2. Data about data is normally termed as
 - a. Directory
 - b. Data bank
 - c. Metadata
 - d. None of the above

c
3. A logical schema
 - a. Is the schema of entire database that DBMS can understand,
 - b. Describe database in conceptual form
 - c. Describes how data is actually stored on disk
 - d. Both a and c

b
4. Related fields in a database are grouped to form a
 - a. Data file
 - b. Data record
 - c. Menu
 - d. Bank

b |
5. The level of data abstraction which describes how the data is actually stored is :
 - a. conceptual level
 - b. physical level
 - c. file level
 - d. none of these

b
6. If DBA modify the structure of the data record then this modification do not affect other application is called as _____.
 - a. Data Isolation
 - b. Data Independence
 - c. Data Security
 - d. Data Integrity

b
7. If person A want to transfer fund of Rs.500 to person B. If failure occurs after removing Rs.500 from Account A and before transferring to Account B then problem caused is _____.
 - a. Data Redundancy
 - b. Data Isolation
 - c. None of these
 - d. Data Atomicity

d
8. Which of the following is not the type of data independence?
 - a. Logical Data Independence
 - b. Physical Data Independence
 - c. Both a and b
 - d. None

d
9. Which data model is also called object-based data models?
 - a. conceptual level
 - b. physical level
 - c. file level
 - d. none of these

c | b
10. The _____ can be used to explain data independence.
 - a. One-schema architecture
 - b. Two-schema architecture

c

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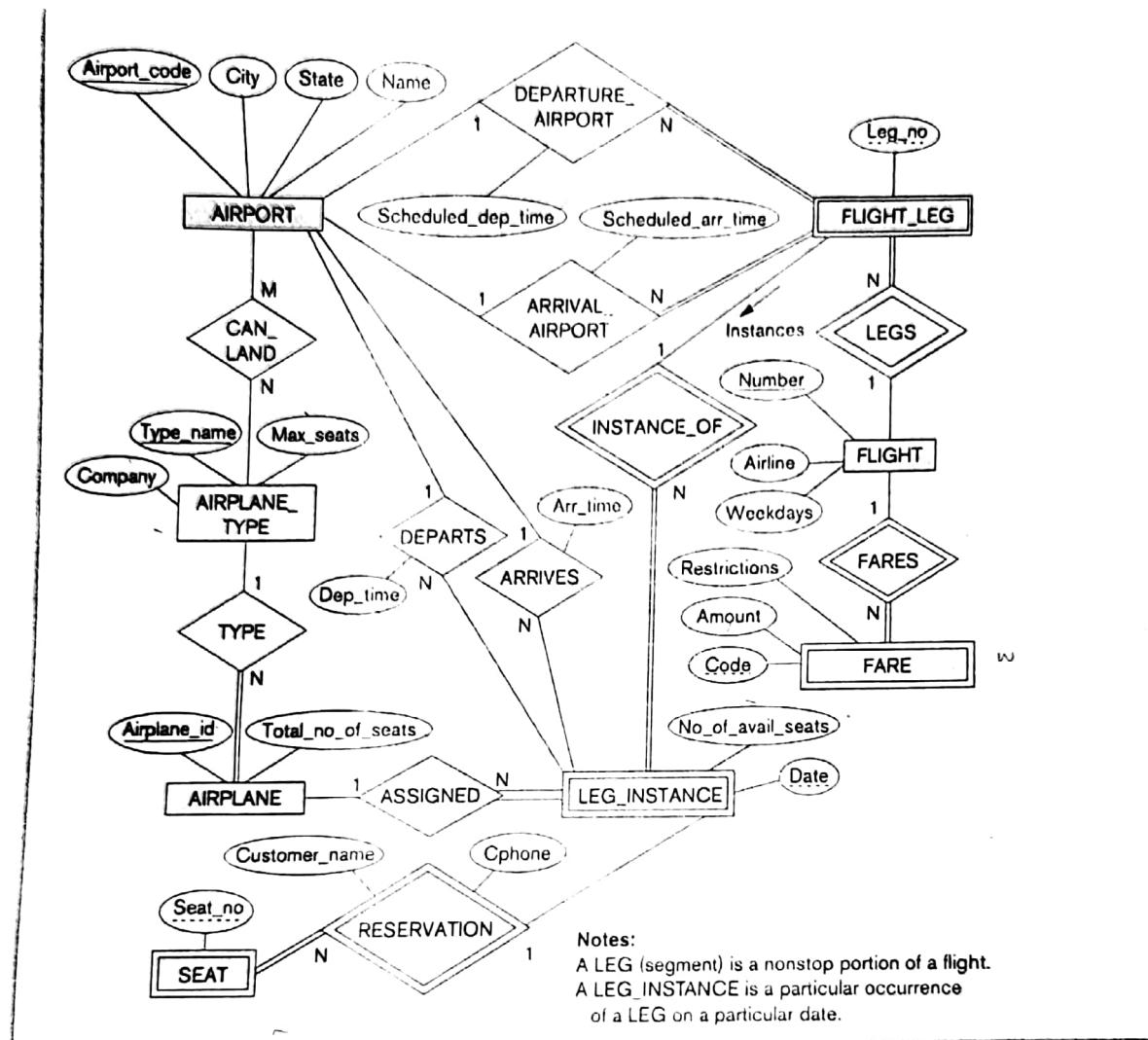
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- c. Three-schema architecture
 - d. Four-schema architecture
11. Separating external data from _____ data is achieved using logical data independence.
- a. Logical
 - b. Conceptual
 - c. Analytical
 - d. Physical
12. Data Isolation caused due to _____ in traditional file system.
- a. Scattering of Data
 - b. Duplicate Data
 - c. Complex Data
 - d. Atomic Data
13. What is TRUE about Logical Data Independence?
- a. We wouldn't impact the user view of the data if we changed the conceptual view of the data.
 - b. User interfaces are logically independent of data.
 - c. Both a and b
 - d. None of the above
14. Which of the following is/are TRUE about DDL command?
- a. Our data is stored in a table that is described by the schema, thus DDL commands deal with the schema.
 - b. With the DDL commands, any structural changes can be made to the table, including creation, deletion, and alteration.
 - c. Both a and b
 - d. None of the above
15. Which of the following features enables a DBMS to reduce data redundancy and inconsistency?
- a. storing same data in multiple files
 - b. Maximize isolated files with repeated data.
 - c. Minimize isolated files with repeated data.
 - d. None of these
16. For _____ mapping, the request must be transformed from external level to conceptual level.
- a. External
 - b. Conceptual
 - c. Internal
 - d. Both a and b
17. Which Schema is also known as Physical Schema?
- a. Internal
 - b. Conceptual
 - c. External
 - d. None
18. What is TRUE about Conceptual level?
- a. Describes how the entire database is structured conceptually.
 - b. Conceptually, a database describes what data will be stored in it and what relationships exist among them.
 - c. Details of internal implementation such as a data structure are hidden at the conceptual level.
 - d. All of the above
19. _____ User interaction with a database system is described by the view schema.
- a. End
 - b. Inter
 - c. Front
 - d. Back
20. NoSQL database is
- a. a next-generation DB
 - b. used for big data, mainly retrieval purpose

- c. horizontally scalable
- d. All of the above



21. An Edge between a entity set and a binary relationship set can have an associated minimum and maximum cardinality, shown in the form of A and B, where A is the minimum and B is the maximum cardinality. What a minimum Cardinality value of 1 indicates?

- a. Partial Participation of the entity set in the relationship
- b. Total Participation of the entity set in the relationship
- c. Database Constraints
- d. The entity participates in at most one relationship
- e. No limit on participation

22. An Edge between a entity set and a binary relationship set can have an associated minimum and maximum cardinality, shown in the form of A and B, where A is the minimum and B is the maximum cardinality. What a Maximum Cardinality value of 1 indicates?

- a. Partial Participation of the entity set in the relationship
- b. Total Participation of the entity set in the relationship
- c. The entity participates in at most one relationship
- d. No limit on participation

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23. A weak entity set in an E-R diagram is an entity set that:
- has a key attribute
 - must be part of a one to many relationship set
 - is not existence dependent on a dominant entity
 - must not participate as owner in an identifying relationship with another entity set
24. In an E-R, Y is the dominant entity and X is a subordinate entity. Then which of the following is incorrect?
- operationally, if Y is deleted, so is X
 - X existence is dependent on Y
 - operationally, if X is deleted, so is Y
 - operationally, if X is deleted, Y remains the same

For questions that follow, refer to the figure that shows the ER Diagram of an Airline Database system. Choose the best option for answering the given MCQs.

25. Which of the following is a key attribute?
- Seat_no
 - Code
 - Date
 - Type_name
 - All of the above
26. All of the following are weak entities except:
- Fare
 - Seat
 - Leg Instance
 - Flight Leg
 - None of the Above
27. Which of the following is a multi-valued attribute?
- Seat_no
 - Airplane_id
 - Cphone
 - Weekdays
 - None of the above
28. Which of the following is a composite attribute?
- Airline
 - Company
 - Customer_name
 - Max_seats
 - None of the above
29. Which of the following is not true about Flight Legs:
- A single flight leg must depart from one airport only
 - A single flight leg must arrive to one airport only
 - Many flights may depart from the same airport
 - A flight may not depart from any airport
 - None of the above
30. Which of the following is an example of identifying relationship type?
- Instance_of
 - Fares
 - Reservation
 - a and b only
 - a, b and c
31. What does leg_no indicate for FlightLeg?
- Key Attribute
 - Derived Attribute

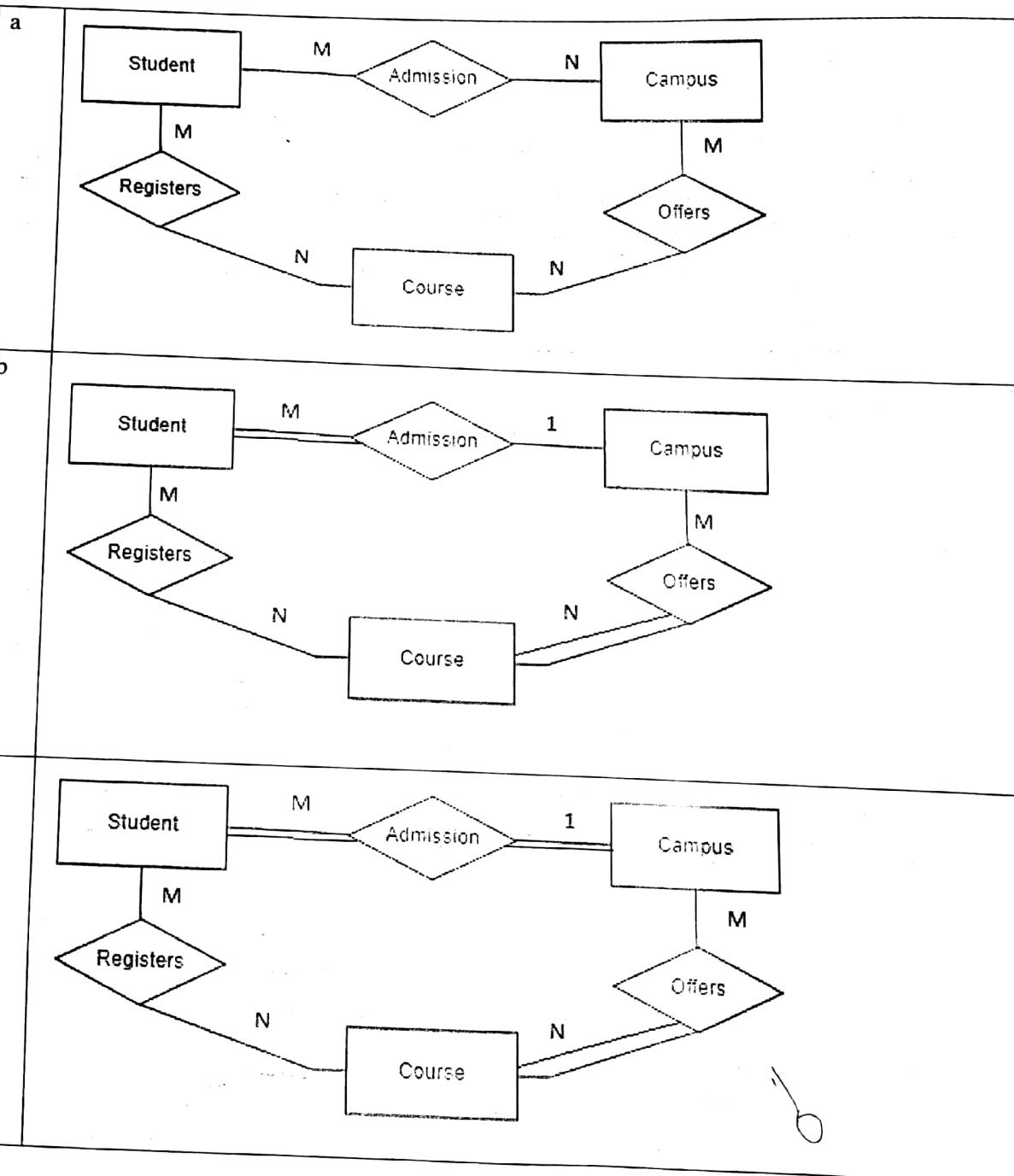
- c. Identifying attribute of a weak identity
d. None of the above
32. Which of the following is an example of a Recursive Relationship
a. Can_Land
b. Assigned
c. Departs,Arrives
d. Legs,Fares
e. None of the Above
33. Give an example of a derived attribute:
a. Max_seats
b. Code ✓
c. Dep_time ✓
d. Number
e. None of the above
34. Which of the following correctly captures the structural constraints in the Airport ---- Can land---
AirPlane_Type relation
a. (1,M), (1,N)
b. (1,1), (M,N)
c. (1,N), (1,M)
d. (0,1),(M,N)
e. (0,M), (0,N)
35. Which of the following correctly captures the structural constraints in the Airport ---
Departure_Airport --- FlightLeg relation
a. (1,0), (1,1)
b. (1,1), (1,N)
c. (1,1), (0,N)
d. (0,N),(1,1)
e. (0,N), (0,1)
36. Which of the following correctly captures the structural constraints in the LegInstance ---- Arrives
--- Airport relation
a. (1,0), (1,1)
b. (1,1), (1,N)
c. (1,1), (0,N)
d. (0,1),(0,N)
e. (0,N), (0,1)
37. What is not true about LEG_INSTANCE -----DEPARTS----- AIRPORT
a. In the DEPARTS binary relationship type, AIRPORT:LEG_INSTANCE is of cardinality ratio 1:N
b. Each airport can be related to any number of LEG_INSTANCES
c. A LEG INSTANCE can be related to (departs from) at most one AIRPORT
d. For this particular relationship type DEPARTS, a particular AIRPORT entity can be related to any number of LEG_INSTANCES.
e. A LEG INSTANCE can be related to any number of AIRPORTS.
38. What is true about AIRPLANE_TYPE --- _TYPE---AIRPLANE Relationship:
a. An AIRPLANE entity can exist only if it participates in at least one TYPE relationship instance
b. The participation of AIRPLANE in TYPE is total participation
c. Every entity in the total set of AIRPLANE entities must be related to a AIRPLANE_TYPE entity via TYPE.
d. There is existence dependency between AIRPLANE and AIRPLANE TYPE entity
e. All of the above

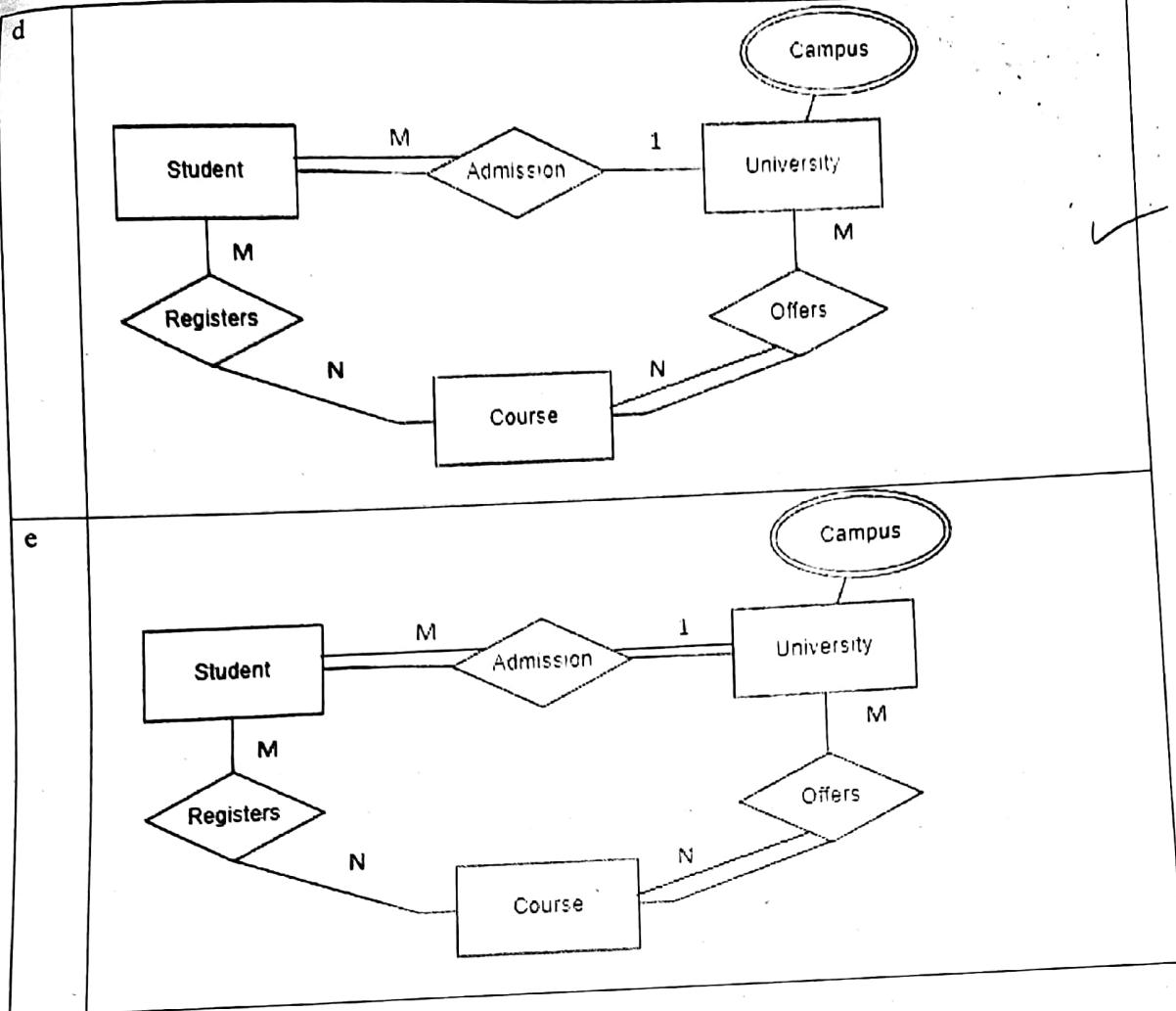
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Question-2 [22 points]

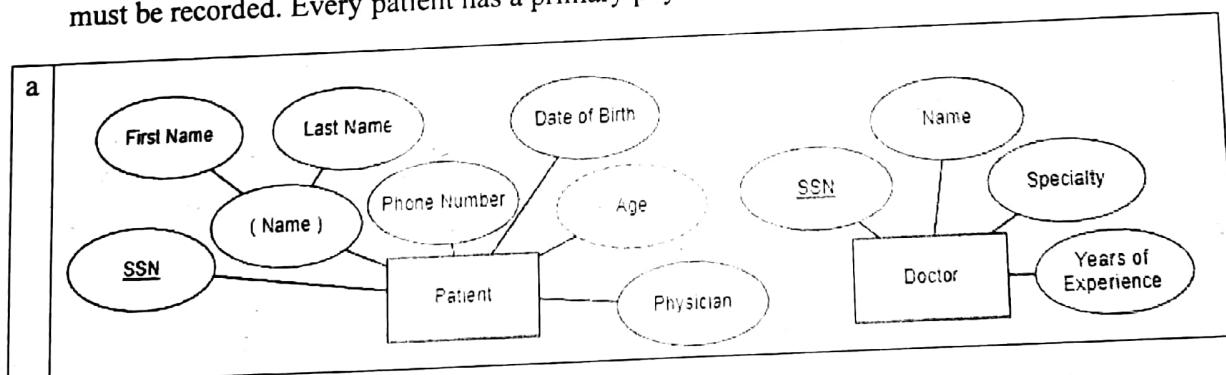
Select correct Entity Relationship Diagram (ERD) for the given scenarios. [Q1-5 (5x2=10 marks), Q6-9 (3x4=12 marks), Total=22 marks]

1. FAST university has campuses in Islamabad, Lahore, Karachi, Peshawar and Faisalabad. Student can take admission in any campus of FAST. Student can also take course(s) in any campus.

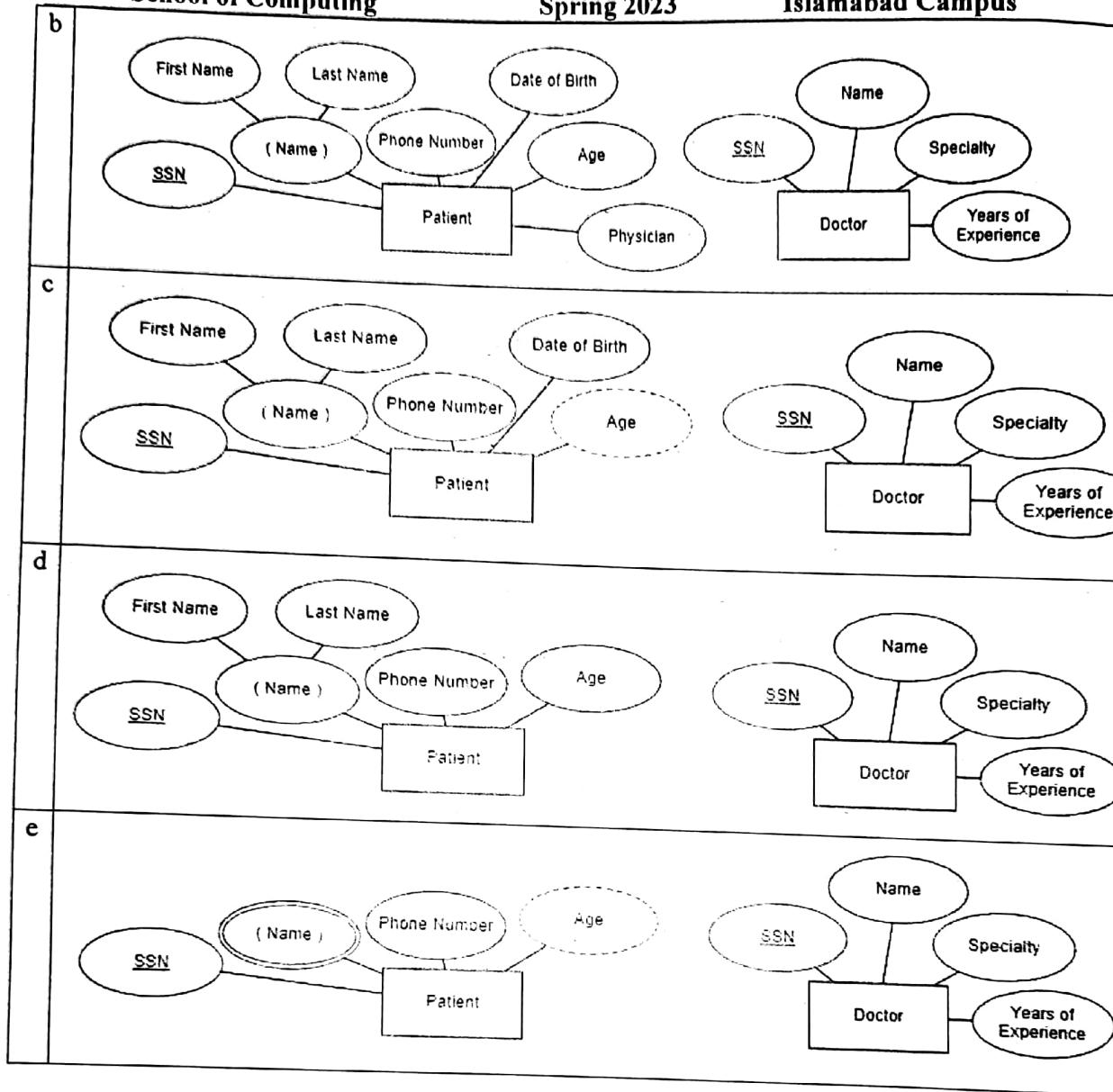




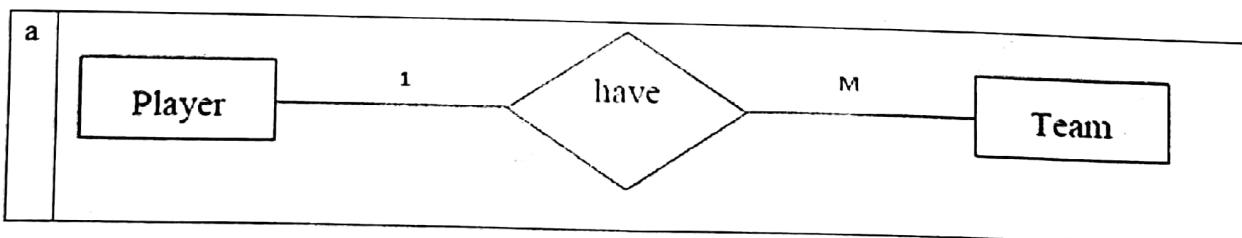
2. Patients are identified by an SSN, and their names, addresses, and ages must be recorded. Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. Every patient has a primary physician.

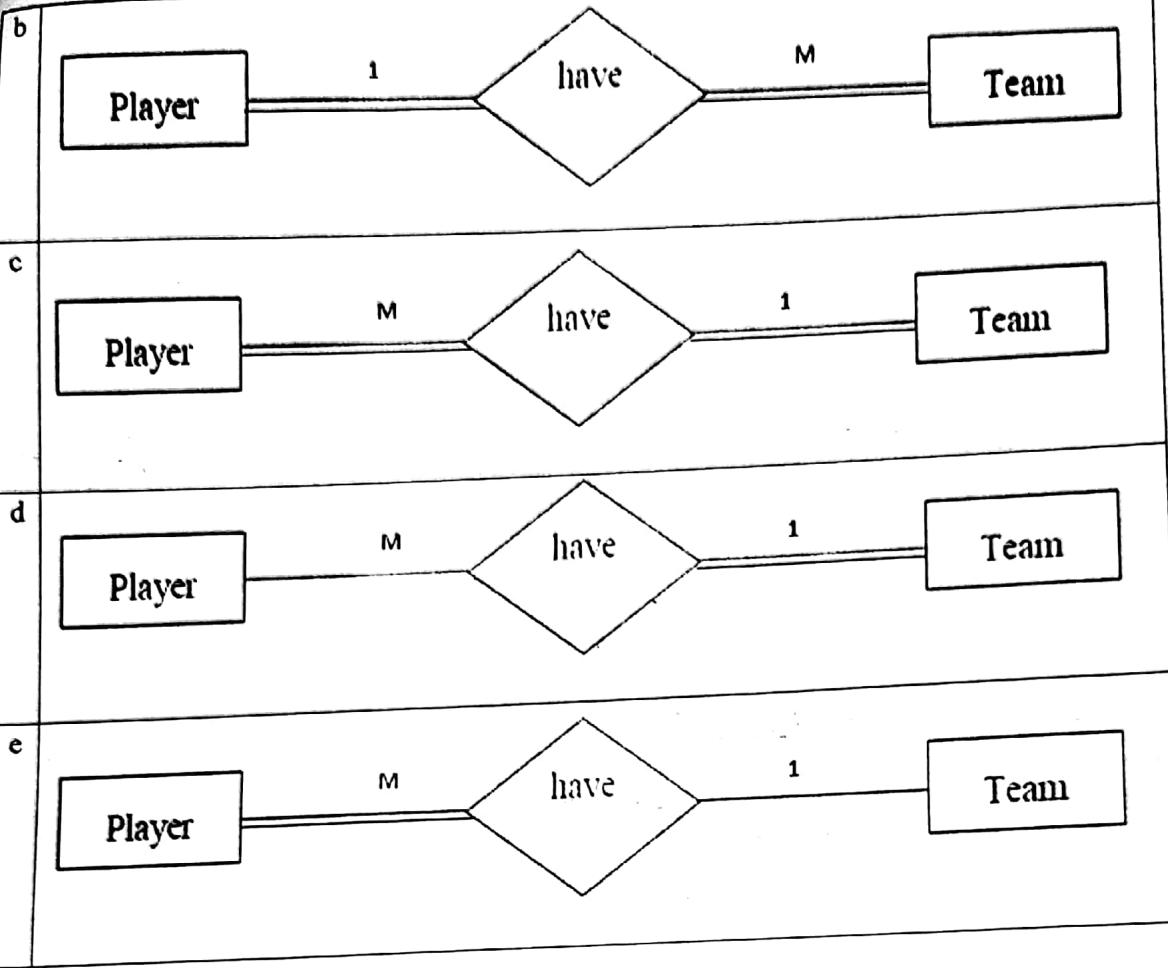


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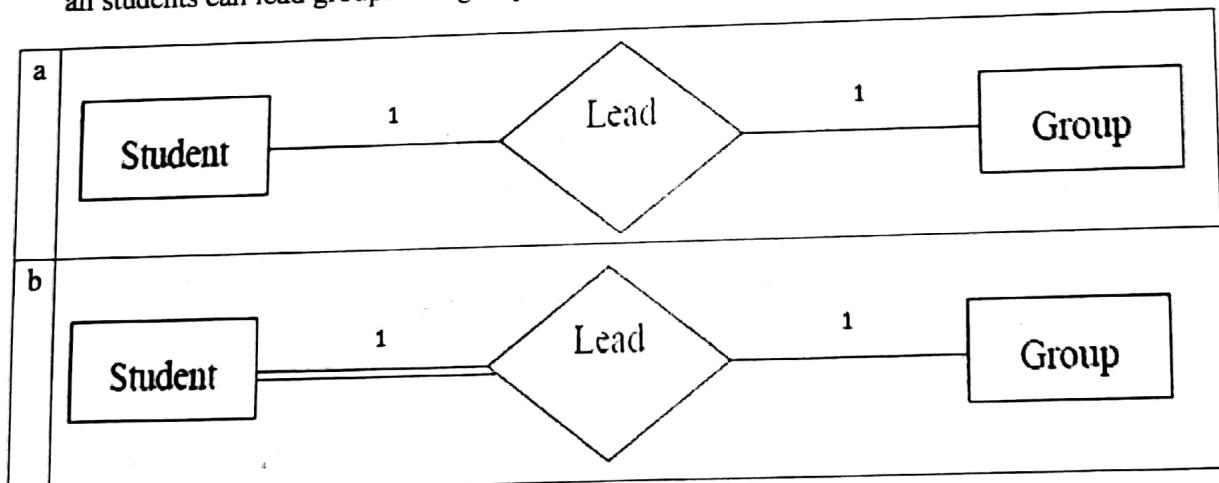


3. Each Player may play in 0 to 1 team, and each Team should have many Players. All teams must have players and a player may not have team.





4. Each Student may lead 0 to 1 Group, and each Group should be led by only one Student. Not all students can lead groups. All groups must be led.

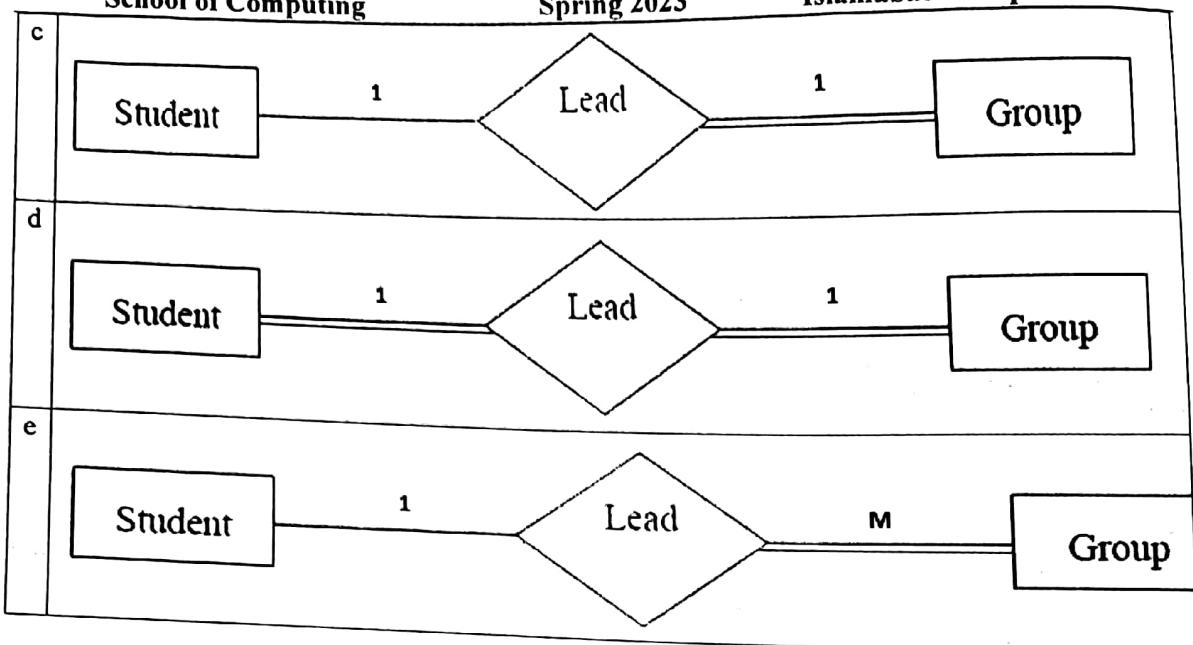


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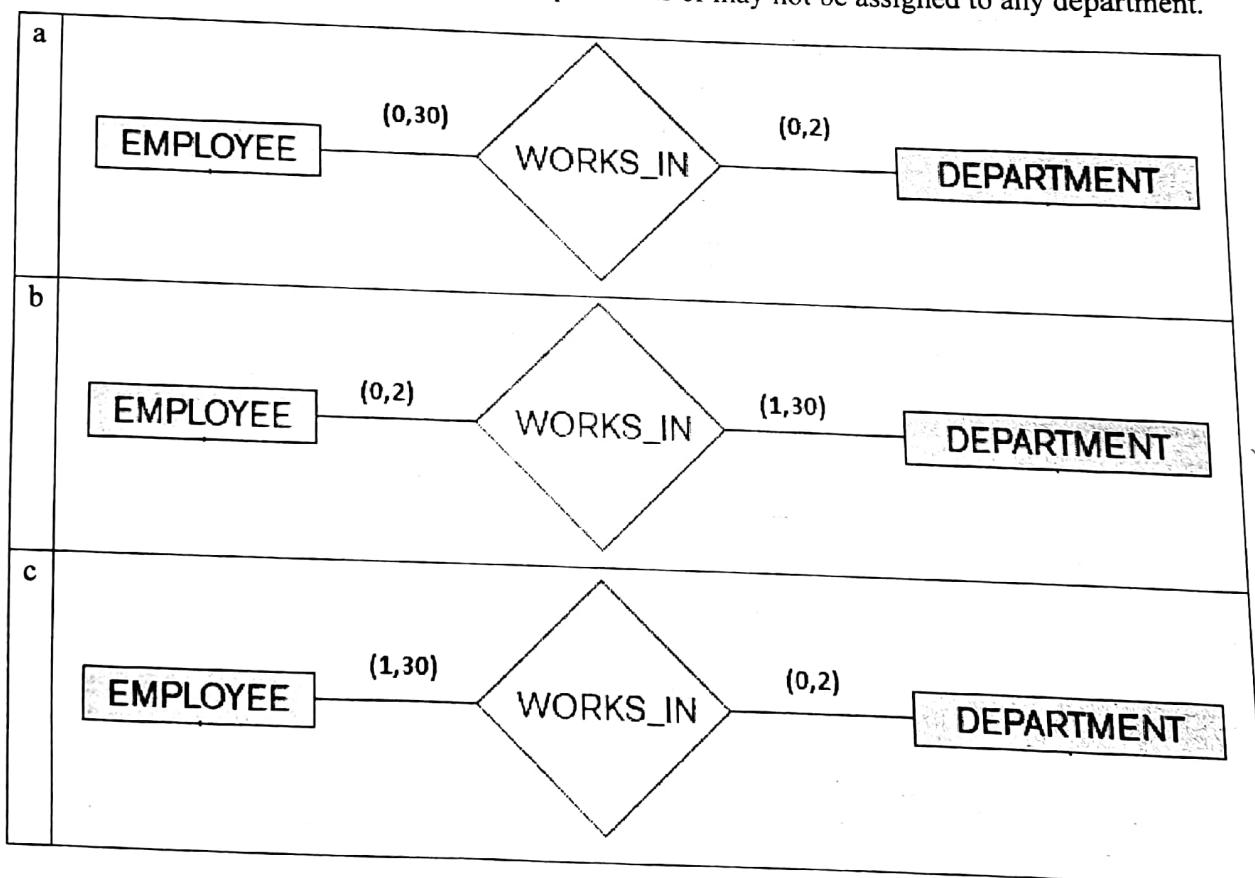
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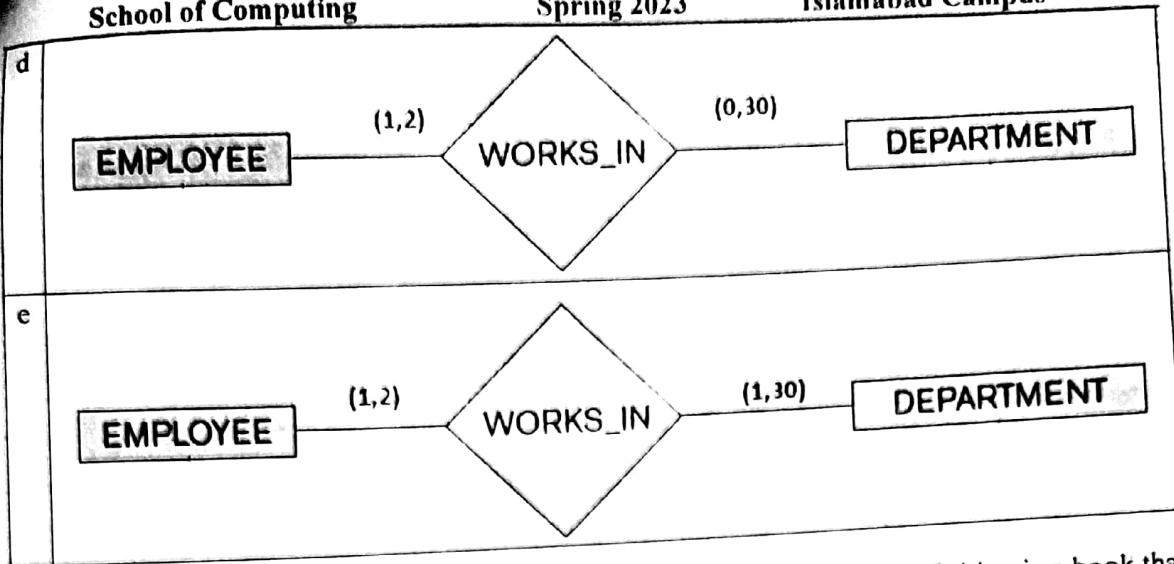
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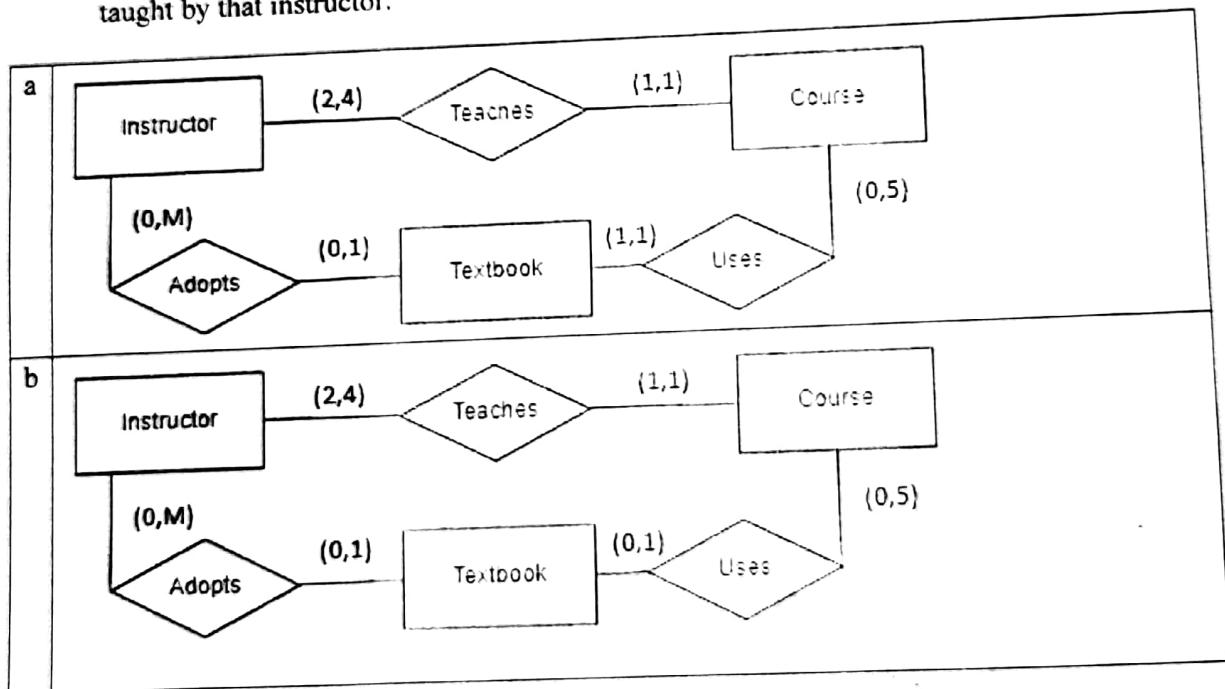


5. An employee may work in up to two departments or may not be assigned to any department.

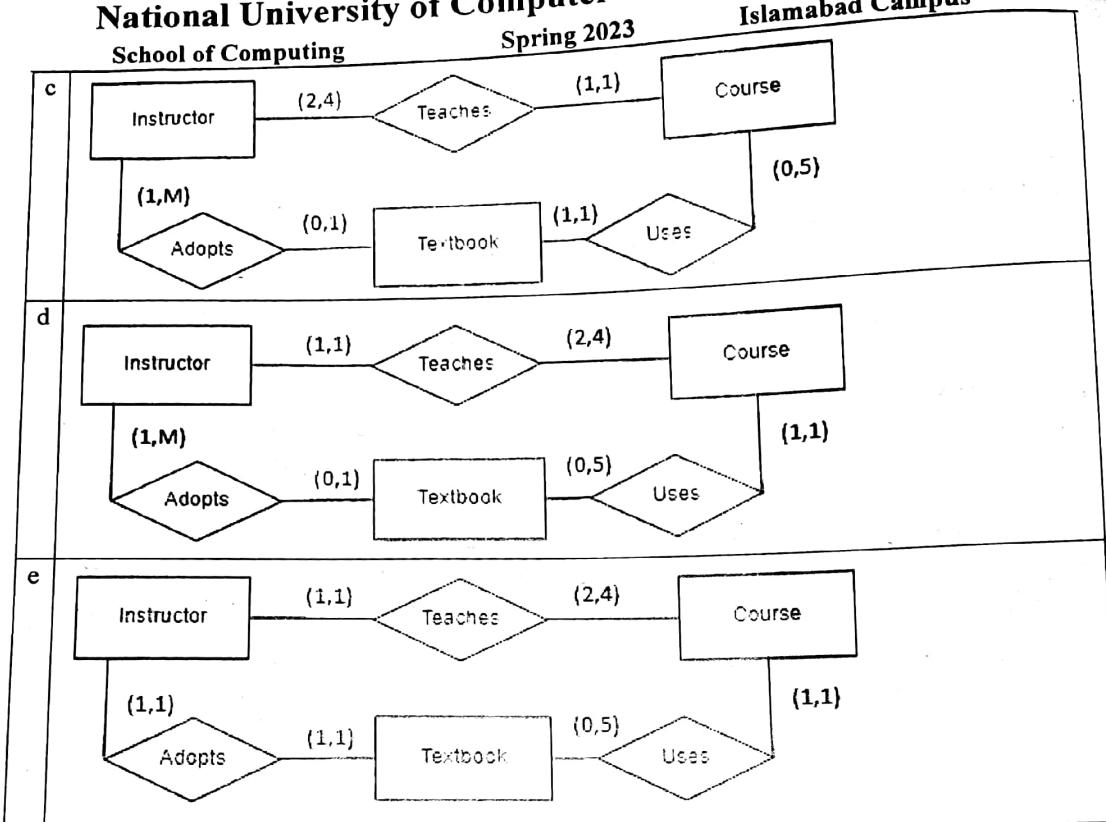




6. Assume that a course may or may not use a textbook, but that a text by definition is a book that is used in some course. A course may not use more than five books. Instructors teach from two to four courses. Each course is taught by exactly one instructor. Each textbook is used by one and only one course. An instructor does not have to adopt a textbook for all courses.
- If a text exists, it is used in some course, hence it is adopted by some instructor who teaches that course. An instructor is considered to adopt a text if it is used in some course taught by that instructor.



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Q7-8

Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows:

The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code.

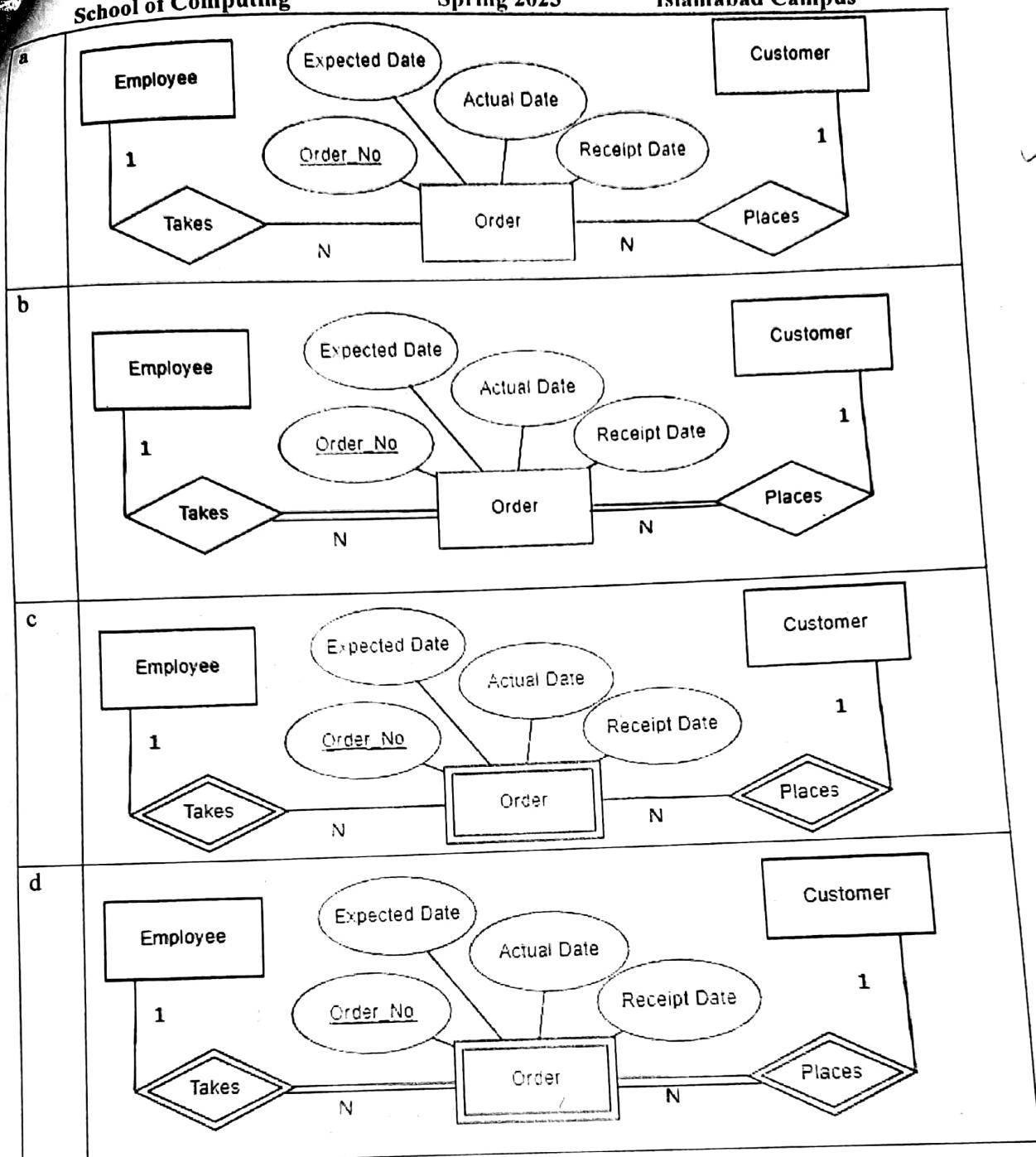
Each customer of the company is identified by a unique customer number, first and last name, and Zip Code.

Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock.

Each order placed by a customer is taken by an employee and is given a unique order number.

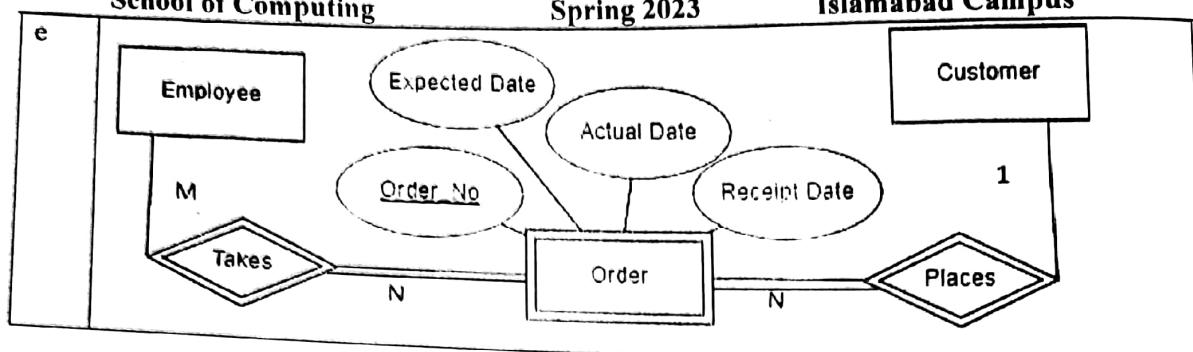
Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected ship date. The actual ship date is also recorded.

7. Select correct conceptual schema considering relationship between customers, employees and orders only.

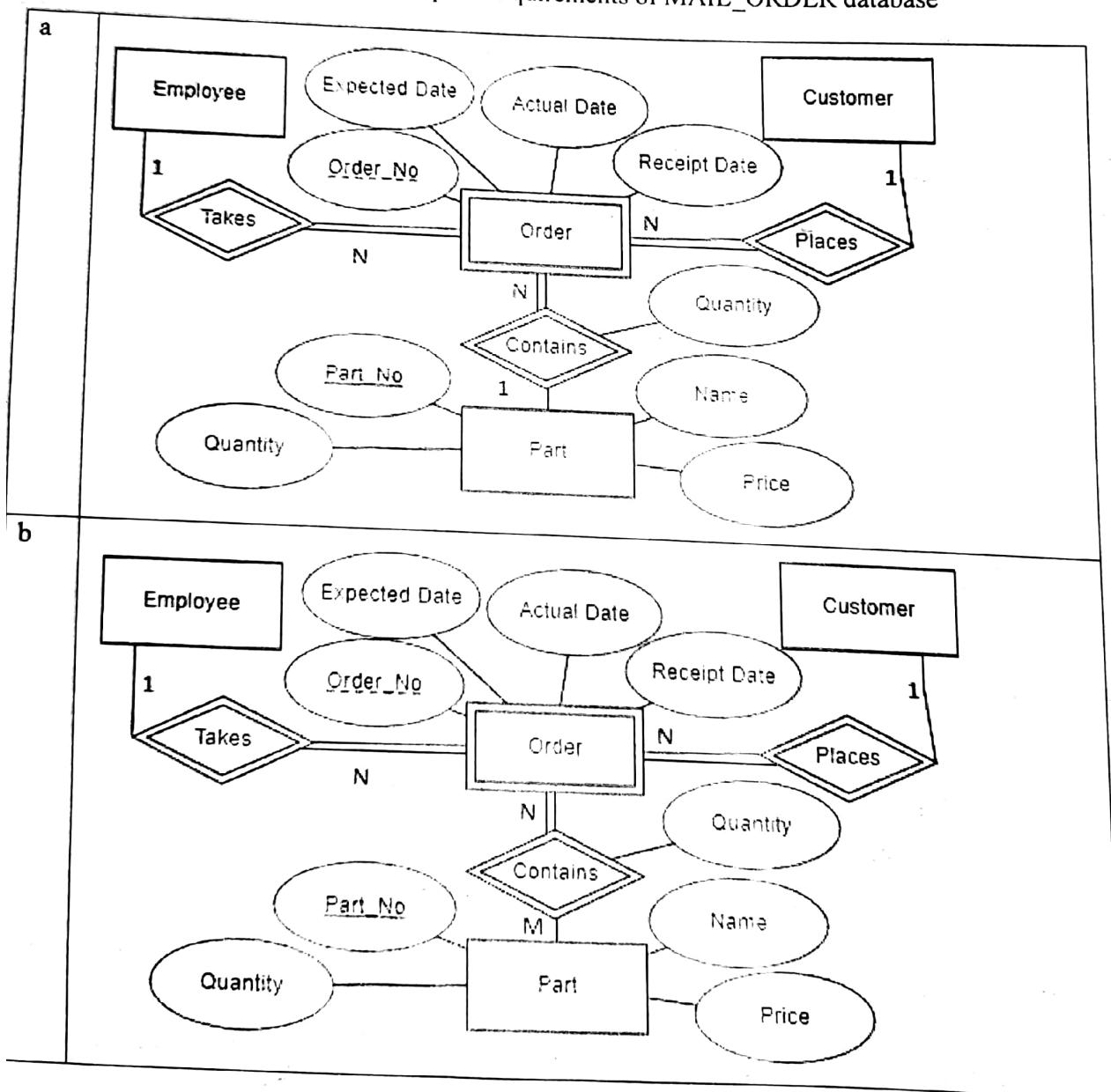


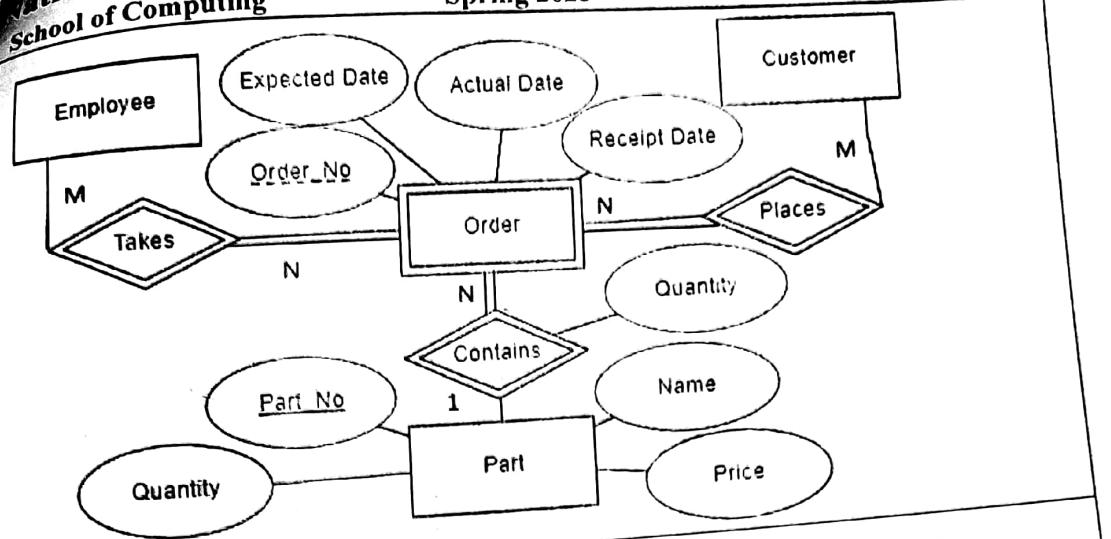
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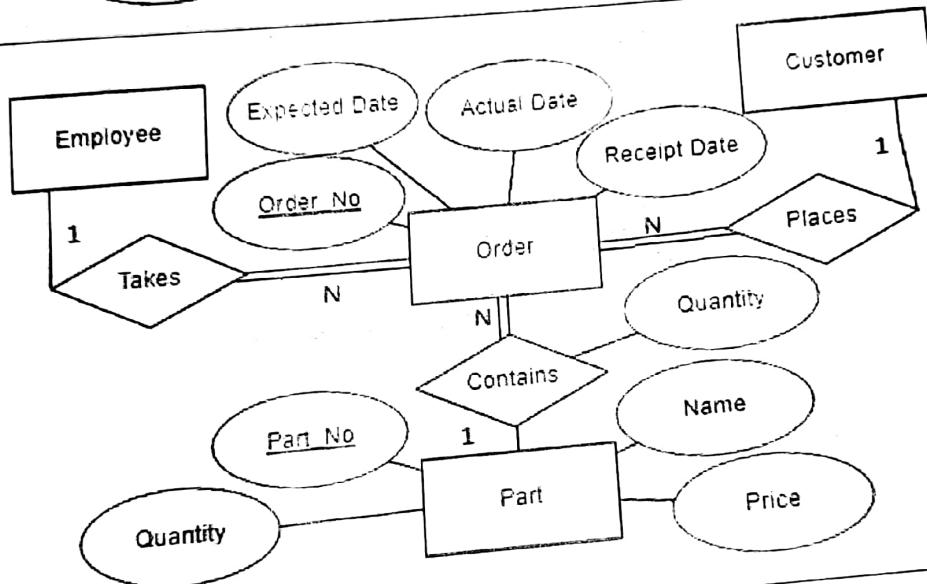


8. Select correct ERD covering complete requirements of MAIL_ORDER database





d

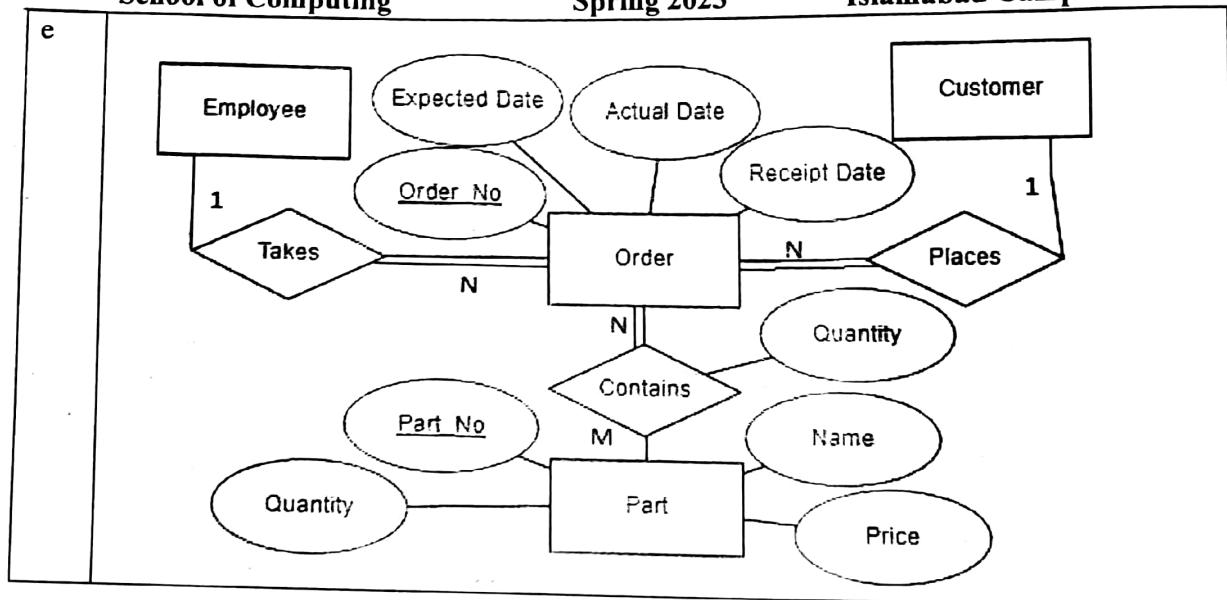


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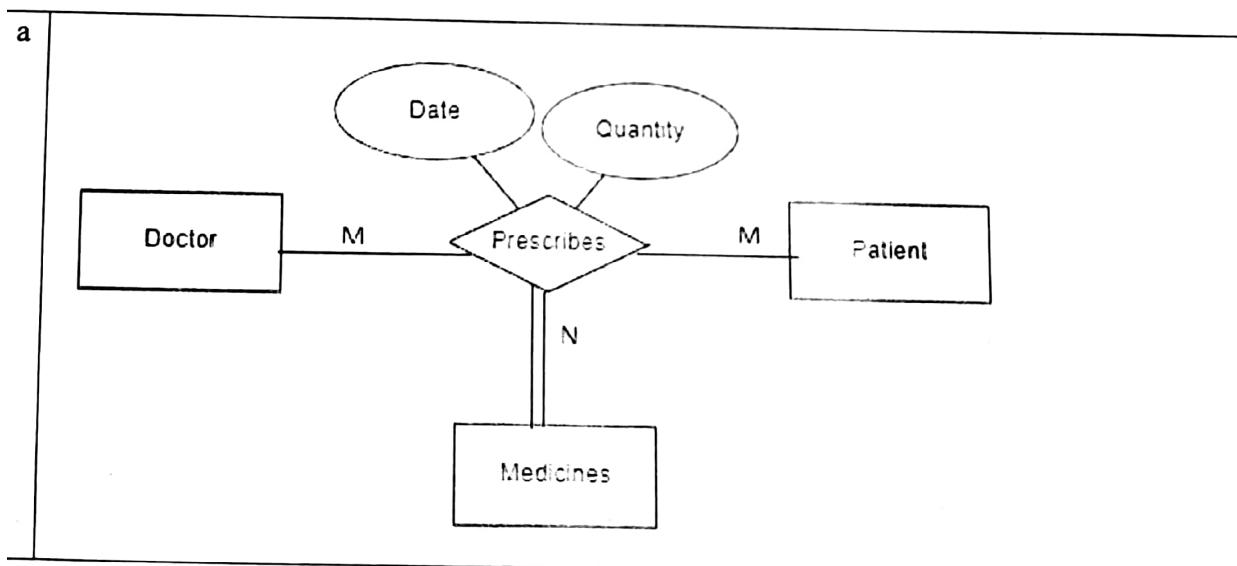
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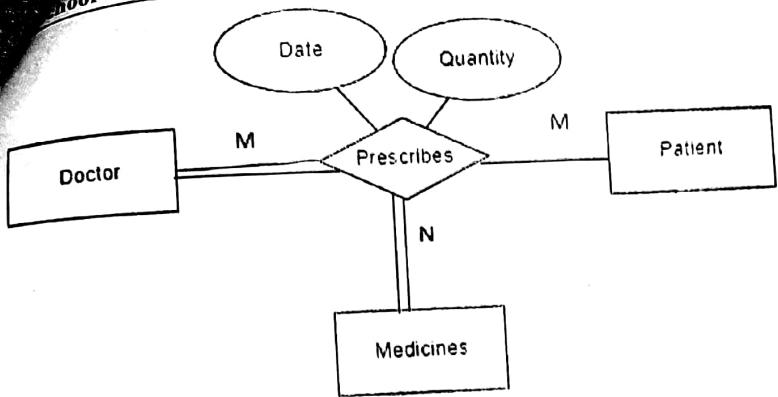
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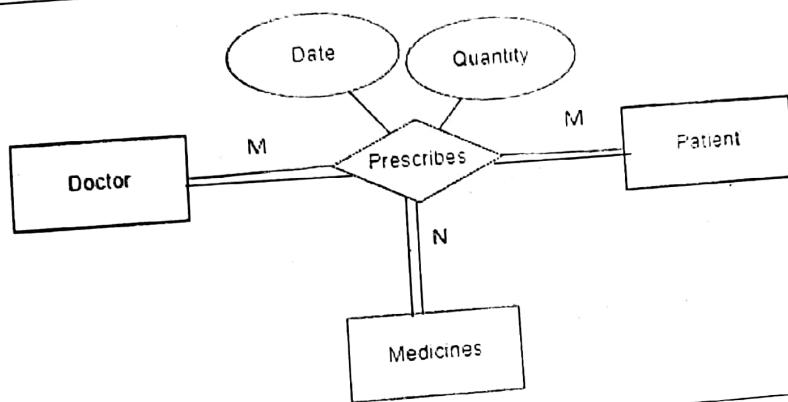


9. Doctor prescribes medicines to the patient.

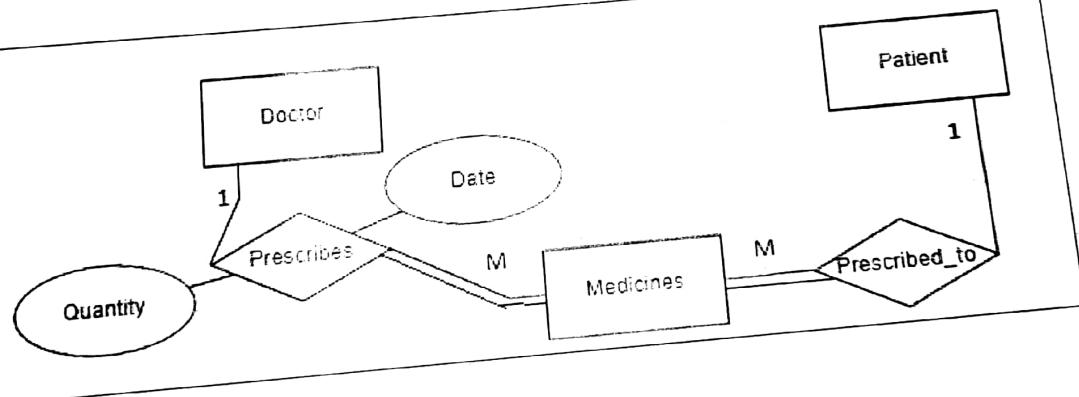




c



d



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Question 1: MCQs – [38x1 = 38 Points]

Please completely fill the box for the correct answer like this and not like this or this .

Cutting, over writing, multiple answers or not correctly filling the box would be considered as

incorrect. There is no negative marking.

Sr. No	A	B	C	D	E	Sr. No	A	B	C	D	E
01						20					
02						21					
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30.

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0/10

Question 2: 1-5 MCQs – [5x2 = 10 Points]

Sr. No	A	B	C	D	E	Sr. No	A	B	C	D	E
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02						05					
03											

4/2.

Question 2: 6-9 MCQs – [4x3 = 12 Points]

Sr. No	A	B	C	D	E	Sr. No	A	B	C	D	E
06						07					
08						09					