DBMS Assignment

1) a) This table is not in 1NF because in the "Course" column has multiple values. But for a table to be in 1NF it must contain only atomic values at each row and column.

Here the attribute "Id" is the primary key and the candidate key. The attributes "Name", "Age", "Location", "Course" are non prime attributes. "Id" is the prime attributes.

The 1NF would be:

Id	Name	Age	Location
1	Sachin	22	Delhi
2	Ram	22	Jamshedpur
3	Mike	23	chennai
4	Sameer	21	Benguluru
5	Vijay	22	Mumbai

Id	Course
1	OS
1	DBMS
2	DAA
2	DBMS
3	ML
3	OS
4	DAA
4	ML
5	ML
5	DBMS

→ Here the primary key is {Id, Course}

b) The 2nd table provided in the question is already in a 1NF. So, no need to convert.

For table 1(a):-

    Primary Key - ID

    Candidate Key - ID, Name, Location

    Prime Attributes - ID, Name, Location.

    Non - Prime - Age, Course.

For table 1(b):-

    Primary - Id

    Candidate - Id, Name, Phone, State

    Prime - Id, Name, Phone, State.

    Non - prime - Country.

2) a) This is not in 2NF, because it is not fully functionally independent as

$$EmpID \rightarrow Name, Age$$

$$EmpID, Dutyshift - ID \rightarrow Dutyshift$$

* Primary Keys $\longrightarrow$ EmpID

* Candidate $\longrightarrow$ EmpID, Name, Age

* Prime $\rightarrow$ EmpID, Name, Age.

* Non - Prime $\rightarrow$ Duty-shift-id, Duty-Shift

Converted table:-

i)

EmpID	Name	Age
101	Arun	26
102	Bobby	28
103	Suresh	32
104	Sita	24

Emp-ID	Duty shift-ID	Duty shift
101	1	Morning
102	2	Afternoon
103	3	Night
104	1	Morning

b) This table is not in 2NF because it is not fully functionally independent as

Emp-ID $\longrightarrow$ Name

Emp-ID, Project-ID $\longrightarrow$ Project Name, No-of-hours.

* Primary key → Emp-ID
* Candidate key → Emp-ID, Project-ID
* Prime attributes → "   "
* Non-prime "   → Project Name, no-of-hours.

Converted table:-

Emp-ID	Name
123	Ajay
321	Charu
546	Rajesh
765	Abhishek

Emp-ID	Project-ID	Project-Name	No-of-hours
123	Prj-21	Speech system	10
321	Prj-45	HR system	15
546	Prj-24	Automate tickets	23
765	Prj-11	NLR	16

3) a) 3NF would be

primary key

Building	Contractor	Builder
B-2156	Taylor	Prestige
B-5765	Sandeep	Hiranandani
B-4567	Vishaka	Tata

primary key - {contractor, fee}

Contractor	Fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990

b) Here there exist transitive dependency. So, it is not in 3NF

{contractor} → {Fee}

There should be no transitive dependency in 3NF. There should

{Building} → primary key

{constructor, Building, Fee} → non prime attributes

{Building} → Contractor

{Building} → Builder

{Contractor} → Fee

Transitive dependency on BuildingID. So in 3NF.