Question 1 – 20 Marks

The **Ceylon Hospital** database stores details about Doctors, Patients, Appointments, Payments, Diagnosis, and Admitted Patient records like in a typical hospital. The data stored in this centralized database helps in recording the details of entities, and answering queries useful in such an environment.

You need to consider the following basic requirements:

- Each doctor has a doctor ID. All the personal details of the doctor are recorded.
- A doctors may see many patients
- A patient is identified by a patient ID, and other personal details. A patient may make an appointment with many doctors.
- Appointments to see a doctor are recorded by the secretary, which includes the – appointment number, patient ID, patient name, doctor, location, and time/date and a contact number.
- Payments are recorded for all completed appointments, and also include the mode of payments as cash or credit-card.
- The doctors may record a Diagnosis after seeing the patients. The diagnosis record includes the diagnosis ID, patient details, id of the last appointment, and diagnosis determined by the doctor. It also contains a column to indicate how to do a Follow-up with the patient.
- Admitted Patients are assigned to a ward and a room number. Each admitted patient is also assigned a Nurse who looks after the patient.
- There are many nurses working in the hospital, but a nurse is assigned to look after only 1 patient. Nurses work only on the ward they are allocated.
- There are 4 wards in the hospital, indicated by ward number, name and floor. Each ward is managed by a Head Nurse working in hospital.

Draw an ER diagram for the above given scenario. State any assumptions you make.

[20 Marks]

Question 2 - 20 Marks

(a) Compare the database approach with the file based approach for DB applications. Use a diagram to illustrate your answer.

[5 Marks]

(b) Explain 3 advantages 3 disadvantages of the database approach compared to the file based approach.

[5 Marks]

(c) Explain what is meant by the relational model. What are the characteristics of this model?

[5 Marks]

(d) Map your database design for Question 1 to the relational model.

[5 Marks]

Question 3 - 20 Marks

a) List down clearly the requirements to be satisfied for each of the first 3 normal forms.

[10 marks]

b) Validate any two tables of your database design in Question 2 (d) using normalization. Clearly indicate steps and reasons for your conclusions

[10 Marks]

Question 4 - [20 Marks]

Write down SQL statements to carry out the following tasks for the database in Question 2 (d)

a) Create a table of your choice.
b) Insert a record to the table you create in part (a) above.
c) List down all the details of all doctors.
d) List down all admitted patients.
e) List down all doctors who live in Kandy.
f) List down the patient names who are admitted to the ward with ward number "W001".
g) List down the patient names who are admitted to the Surgical ward.
h) Display a list of patients with the name of the nurse who is looking after the patient.
i) Update the name of the ward with ward number "W001" to "Surgical Ward"
j) Delete all appointment details/records older than 2014 Jan 01.

[2Marksx10]