Hospital management system

**Admission**

A patient is admitted to the hospital by filling up a form (Attachment 1). The form data is entered into the system by an operator using a graphical user interface (to be designed by the students). In the interface, there will be some mandatory fields and some optional as mentioned in the form. After filling up and submission using the interface, all data will be saved in the database to the corresponding tables and a receipt will be printed as per Attachment 2.

**Doctor Initial Investigation**

After admission, a duty doctor will record all information of the patient as per the printed patient information form generated from the system as per Attachment 3. A nurse will submit all data recorded by the duty doctor using an Interface (to be designed by the student).

**Medical treatment by Specialist**

Each patient is admitted into the hospital under a specialist. A specialist may be Professor, Associate Professor, Asst. Professor or Consultant. Whenever, a specialist visits a patient, he/ she advises the patient about different medicines and tests as per Attachment 4. A nurse of the ward gives the entry of the medicine and test information using an Interface (to be designed by the students). An order is prepared for medicine and for test accordingly.

**Issue Medicine**

Medicine order is sent to the medicine store and medicines are issued to the patient entering the medicine data using an interface (to be designed by the students). Medicine data contains the price of the medicine and the amount issued to that patient.

**Test Result**

Test order is sent to the Pathology/Radiology/Imaging centers as per the test order. Test samples are sent to the Pathology center if it is pathology test. For each sample, patient id is used as sample id and has a collection date and time. Test result is given sample wise. Radiology or Imaging are done by corresponding centers for different tests and results are stored as text and images.

**Hospital Doctor, Nurse and Ward Management**

The hospital management system contains information about doctors, patients, nurses, and other employees. A doctor can have a unique id, name, address, mobile numbers, working days, and specialization. One doctor called registrar will be responsible for a ward. In each ward, there will have many doctors and nurses. Among the nurses, there will be a staff nurse who will be the supervisor of all nurses of the ward. A nurse will be identified by nurse id. The other information for a nurse is name, present address, permanent address, duty shift, and mobile number. A doctor or a nurse can be transferred from one ward to another ward.

In the hospital, there will be many wards and each ward will contain many beds and each bed will have a bed id and rent. Each ward will have an id and type. Each patient will have an id, name, address, ward number / cabin number, disease name, disease severity, special note and bed no. Medicine will be supplied from the store of the hospital. Doctors will give prescriptions to patients from the list of medicines. Each medicine has id, name, price and date of expiry. The Doctor, Nurse, Ward and Medicine data entry/ edit forms are given in Attachments 5, 6, 7 and 8 respectively.

Task 1: Design ERD

Task 2: Transform the ERD into relational schema

Task 3: Create tables using SQL DDL

Task 4: Sample data entry and perform queries given below.

**Output**

The following shall be the output of the system.

* Specialist detailed Bill
* Medicine detailed bill
* Summary bill of a patient for discharge

**Attachment 1**

**Patient Admission Form**

Date of Admission: \_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY)

Mobile (1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mobile (2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Present Address:**

Street No. / Village \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Street Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Thana \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ District \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Permanent Address:**

Street No. / Village \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Street Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Thana \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ District \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Profession**

1. Government job, 2) Private Job, 3) Business, 4) Farmer, 5) Retired 6) Others

Amount deposited: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Choice Cabin / Ward

Signature with date

Name:

Relation with the Patient:

**Attachment 2**

**Patient Admission Receipt**

Patient Id ????????? (generated by the system)

Date of Admission: \_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY)

Mobile (1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mobile (2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Present Address:**

Street No. / Village \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Street Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Thana \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ District \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Permanent Address:**

Street No. / Village \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Street Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Thana \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ District \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Profession \_\_\_\_\_\_\_\_\_\_**

Amount deposited: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cabin No. \_\_\_\_\_\_ or Ward No. \_\_\_\_\_\_\_\_\_\_\_ Bed No. \_\_\_\_\_\_\_\_\_\_

Signature with date

Name of the employee:

Designation:

**Attachment 3**

**Patient Initial Investigation Form**

Patient Id ????????? (generated by the system)

Date of Admission: \_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY) (generated by the system)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY)

**All above information will be printed from system**

­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Patient personal information

Height \_\_\_\_\_\_\_\_ Weight \_\_\_\_\_\_\_

Symptoms of the disease: 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Blood Pressure: Lower \_\_\_\_\_\_\_ upper \_\_\_\_\_\_\_\_\_\_\_\_

General Food Habit:

Breakfast 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lunch 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dinner 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hobby:

Game: 1) Foot ball 2) Hokey 3) Volley Ball 4) Cricket 5) Chess 6) All 7) None

Others: 1) Tourism 2) Writing

Disease Name:

Signature with date

Doctor Id: \_\_\_\_\_\_\_\_\_\_ Name of the doctor:

Designation:

**Attachment 4**

**Medical Advise by the Specialist Form**

Patient Id ????????? (generated by the system)

Date of Admission: \_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY) (generated by the system)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY) Bed No. \_\_\_\_\_ Ward No. \_\_\_\_\_\_\_\_

**All above information will be printed from system**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of advice: \_\_\_\_\_\_\_\_\_\_\_ Time: \_\_\_

Medicine advice

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Serial Number | Name of Medicine | Quantity | Times in a day | Morning | | Noon | | Evening | |
|  |  |  |  | Before meal | After meal | Before meal | After meal | Before meal | After meal |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

Test Advice

|  |  |
| --- | --- |
| Serial Number | Name of the test |
|  |  |
|  |  |
|  |  |

Signature with date

Name of the doctor:

Designation:

**Attachment 5**

**Doctors Information Form**

Doctor Id \_\_\_\_\_\_\_\_\_ (generated by the system)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY) Date of Appointment \_\_\_\_\_\_\_\_\_\_\_\_

Educational Qualification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Serial No. | Degree | Board/Institute | Year | Division/CGPA | Position |
|  | SSC |  |  |  |  |
|  | HSC |  |  |  |  |
|  | MBBS |  |  |  |  |
|  | ,, |  |  |  |  |
|  | ,, |  |  |  |  |

Experience

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Serial No. | Job title | From | To | Organization |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | ,, |  |  |  |
|  | ,, |  |  |  |

Membership

* BMA
* British Medical Society
* American Medical Society
* Others

**Attachment 6**

**Nurses Information Form**

Nurse Id \_\_\_\_\_\_\_\_\_ (generated by the system)

Name: \_\_\_\_\_\_\_\_\_\_\_\_ (First name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (middle name) \_\_\_\_\_\_\_\_\_\_\_\_ (Last Name)

Date of birth: \_\_\_\_\_\_\_\_\_\_\_\_\_ (DD/MM/YYYY) Date of Appointment \_\_\_\_\_\_\_\_\_\_\_\_

Educational Qualification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Serial No. | Degree | Board/Institute | Year | Division/CGPA | Position |
|  | SSC |  |  |  |  |
|  | HSC |  |  |  |  |
|  | BSc (Nursing) |  |  |  |  |
|  | ,, |  |  |  |  |
|  | ,, |  |  |  |  |

Experience

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Serial No. | Job title | From | To | Organization |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | ,, |  |  |  |
|  | ,, |  |  |  |

**Attachment 7**

**Ward Information Form**

Ward Id \_\_\_\_\_\_\_\_\_ (generated by the system)

Ward Name: \_\_\_\_\_\_\_\_\_\_\_\_

Registrar Id \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (from database)

Nurse Supervisor Id \_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (from database)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Serial No. | Bed No. | Bed type | Rent | Status (Empty/ occupied) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| ...... |  |  |  |  |
|  |  |  |  |  |

**Attachment 8**

**Medicine Entry Form**

Supplier Id \_\_\_\_\_\_\_\_ Supplier Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of Supply \_\_\_\_\_\_\_\_\_\_\_ (MM/DD/YYYY)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Medicine Id | Name | Type | Unit price | Quantity | Date of Manufacture | Expiry date |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |