A. Admin Module:

1. **Login/Logout:** Authentication (Admin's user credentials).
2. **Dashboard:** Overview of the system (patients, staff, appointments, etc.).
3. **Manage Doctors:** Add, update, delete doctor details.
4. **Manage Patients:** Add, update, delete patient records.
5. **Manage Staff:** Add, update, delete staff (nurses, lab technicians, etc.).
6. **Manage Departments:** 'Define and manage departments(e.g., Cardiology, Orthopedics, etc.).
7. **Manage Appointments:** View and manage appointments (create, update, cancel).
8. **Billing and Payments:**
   Generate bills for treatments and services.
   Process payments (cash, card, insurance).
9. **Inventory Management:**
   Track medicines, equipment, and other supplies.
10. **Reports:**
   Generate various reports like daily, weekly, monthly activity reports, financial reports, etc.

B. Doctor Module:

1. **Login/Logout:** Doctor-specific login.
2. **Dashboard:** View upcoming appointments, patient history.
3. **Patient Management:**
   View patient details (medical history, previous treatments, etc.).
   Update patient records.
4. **Prescription Management:** Prescribe medicines and tests.
5. **Schedule Appointments:** Set availability for patient appointments.
6. **Medical History:** Maintain and review the patient's medical history.
7. **Billing:** Assist in generating bills based on treatments and services.

C. Patient Module

1. **Login/Registration:** Register as a new patient or login to existing account.
2. **Profile:** View and update personal and medical details.
3. **Book Appointments:** Schedule appointments with doctors.
4. **View Appointment History:** Track past appointments, treatments, and consultations.
5. **Prescription:** View and download prescriptions.
6. **Make Payments:** Pay bills online or through hospital systems.
7. **Reports:** View health reports, lab results, etc.

D. Receptionist/Staff Module:

1. **Login/Logout:** Receptionist login with restricted access.
2. **Patient Registration:** Register new patients and update details.
3. **Appointment Scheduling:** Schedule appointments for patients with doctors.
4. **Patient Admission/Discharge:** Manage patient admission to hospital wards and discharge process.
5. **Billing:** Assist in generating and printing patient bills.
6. **Inventory Checks:** Maintain and update inventory records.

E. Inventory Management Module:

1. **Stock Tracking:**Track and update stock levels of medicines, equipment, etc.
2. **Order Supplies:**Raise orders for new supplies when stock is low.
3. **Inventory Reports:**Generate reports on current stock levels and purchase history.

3. Database Design:

Tables:

1. **Users Table (Admin, Doctor, Receptionist, Patient, Staff):**
   User ID, Name, Role, Username, Password, Contact Details, etc.
2. **Doctor Table:**
   Doctor ID, Name, Department, Specialization, Contact Info, etc.
3. **Patient Table:**
   Patient ID, Name, Address, Contact Info, Date of Birth, Medical History, etc.
4. **Appointment Table:**
   Appointment ID, Patient ID, Doctor ID, Date, Time, Status.
5. **Bills Table:**
   Bill ID, Patient ID, Total Amount, Status (Paid/Unpaid), Payment Date.
6. **Inventory Table:**
   Item ID, Name, Category, Quantity, Supplier, Price.
7. **Prescription Table:**
   Prescription ID, Doctor ID, Patient ID, Medicine Name, Dosage, etc.

4. Technologies:

You can use a combination of technologies to build this system:

- **Frontend:**
  HTML, CSS, JavaScript
  React.js or Angular (for dynamic frontend)
- **Backend:**
  Python (Flask/Django) or Node.js
  Java (Spring Boot) or PHP
  RESTful APIs for communication
- **Database:**
  MySQL, PostgreSQL, or MongoDB (NoSQL for more flexibility)
- **Security:**
  JWT (JSON Web Tokens) for user authentication.
  SSL/TLS for secure communication.

5. Flowchart Example:

Here's a high-level flow of the system:

1. **Admin Logs in**
   Views Dashboard
   Manages Doctors/Patients/Staff/Inventory
   Generates Reports
2. **Doctor Logs in**
   Views Upcoming Appointments
   Provides Consultations and Prescriptions
   Updates Patient Records
3. **Patient Registers/Logs in**
   Books Appointments
   Views Medical Records

Pays Bills Online
4. **Receptionist Logs in**
Registers New Patients
Schedules Appointments
Handles Discharges and Billing

6. Key Features:

- **User Authentication** (Admin, Doctor, Patient, Staff, Receptionist)
- **Appointment Scheduling** and Management
- **Billing and Payment Processing**
- **Inventory Management** for medical supplies
- **Patient Management** (medical history, records, prescriptions)
- **Reporting and Analytics** for administrative insights
- **Search and Filter options** (Doctors, Patients, Inventory, etc.)