International Institute of Health Management Research
Term End Examination
Healthcare Information System Design

Max. Mark: 70 **Max Time: 02:00 Hrs**

All the questions need to be written in paper, scanned, converted into one PDF and uploaded.

1. Read the case carefully and answer the questions provided below:

The neurosurgical unit in Mnsoura General Hospital is a clinical unit receives patients have some type of neurological problem which affect any portion of the nervous system including the brain, spinal cord, peripheral nerves, and extra-cranial cerebrovascular system, and provides them with complex neurological care. Neurosurgical unit has medical team consists of many doctors and nurses. The medical team is responsible for the day running of the unit, according to shifts which determines the responsibility of working inside the unit. When a new medical member joins the unit, he/she registers his/her personal details, qualifications (BSc. MSc., Ph.D.), rank (Consultant, Specialist, Resident, House Offices, High Nurse, Nurse) , and specialty (Neurosurgeon, Anaesthesiologist, Intensive Care Unit Specialist, Neurologist, ..). The unit receives patients from different sources, emergency, external clinic, or another hospital. It receives a number of patients and keeps track of each patient's personal data: ID, name, national ID, address, blood group, sex, birthdate, occupation, social status, nationality, religion, communication mean (home telephone, or mobile) and special habits (smoking, or drugs). It also needs to refer to the city, country, and governorate. Both patient ID and national ID have the same values for each patient. Patient may have many visits for the unit, and each visit is identified using the admission number, admission time and date. After referring the patient to the unit, the receptionist must request the patient to complete his/her personal details. Patient will determine the admission type (Emergency, Insurance, Nation Expense, Treatment with Fee, and Free treatments), and referral source (emergency, external clinic, or others). Then Patient starts to fill a number of consents like approval consent of hospital entrance, treatments reception, blood transfusion, and smoking giving up, and approval consent of receiving medical treatments with fees. These consents require existence of one of patient's relatives and a witness for high risk consent. A patient will requested to meet the doctor who receives patient's history (personal history: present history, past history, family history, and social history). Doctor does several the examinations to determine some medical signs. To assist in the diagnosis, doctors ask the patient to do some investigations (Laboratory, Neuro- physiological, Radio-logical, and Histopathological) which will be necessary in determining diagnosis and treatment plan (Medical, Surgery, Radiosurgery, Radiotherapy, and Chemotherapy). If it is decided to treat patient with surgery, neurosurgical unit must keep track of anaesthetic technique and operative details (operation's type, aesthesia type, position, skin incision, operative steps, intraoperative complications, and closure). Medical team follows up patients clinically and radio-logically. At the end of treatment stage, the doctors re-examine the patient to determine final diagnosis. The unit evaluates treatment plan to ensure of the success of treatment plan and to process weak points in next times. Patient's visit finishes with the determination of patient's discharge state (recovery, improvement, no improvement, death), and patient's discharge type (discharge according

to the patient desire, discharge due to a clinic, discharge to another hospital) and discharge date. The unit is in need of Electronic Management Record System (EMRS).

Draw context level diagram, Zero level diagram and first level diagram for the above case. 45 marks

2. A decision tree approach can be useful to develop an intuitive diagnostic algorithm, using clinical and haematological parameters, that is able to distinguish dengue from non-dengue disease in the first 72 hours of illness. A hospital in Singapore recruited patients to study early onset and outcome of dengue infection. Adult patients (age >18 years) presenting at selected primary care polyclinics within 72 hours of onset of acute febrile illness and without rhinitis or clinically obvious alternative diagnoses for fever were eligible for study inclusion. Upon consent, anonymized demographic, clinical and epidemiological information were collected on a standardized data entry form on 3 occasions: 1–3 days post-onset of fever (1st visit), 4–7 days post-onset of fever (2nd visit) and 3–4 weeks post-onset of fever (3rd visit). Venous blood was also collected for haematological, virological and serological analyses at every visit. Remaining serum and blood were anonymized and stored at −80°C until use. Criteria for categorizing patients were platelet count (PLT) above 193, Lymphocyte lesser than and equal to 0.58 and neutrophil greater than 4.9 were likely non-dengue. Those with neutrophil lesser than equal to 4.9 were likely dengue. Those with PLT greater than 193 and lymphocyte greater than 0.58 were probably non-dengue. Similarly PLT less than equal to 193, WBC greater than 6.0 and haematocrit (HCT) greater than 41.2 were likely non-dengue. Else likely dengue. Those with WBC less than equal to 6.0 and body temperature > 37.4°C were probable dengue and those with temperature less than equal to 37.4°C and PLT less than equal to 143 were likely dengue but those with PLT greater than 143 were likely non-dengue. **Draw decision tree for segregating patients. Marks 15 marks**

3. Design a master patient index for laboratory module or a pharmacy module Marks 10