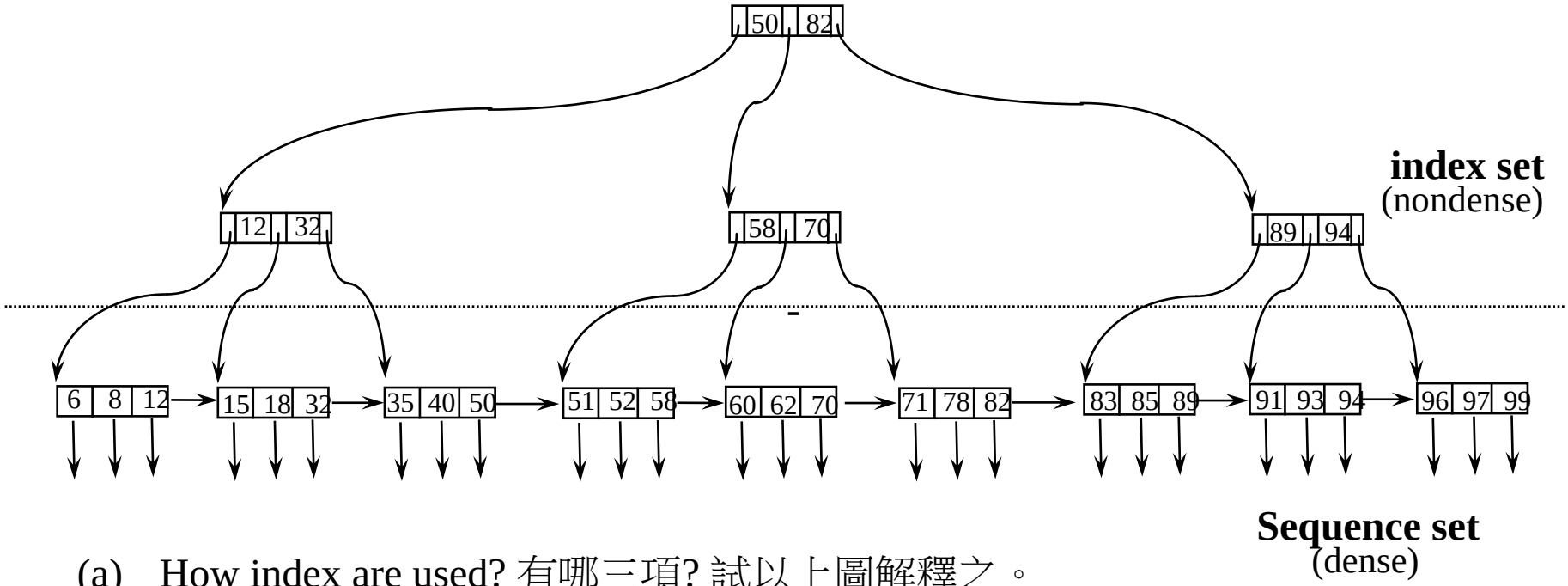
國立東華大學試題

Question 1: [About B+ Tree]　(20%)



(a) How index are used? 有哪三項? 試以上圖解釋之。

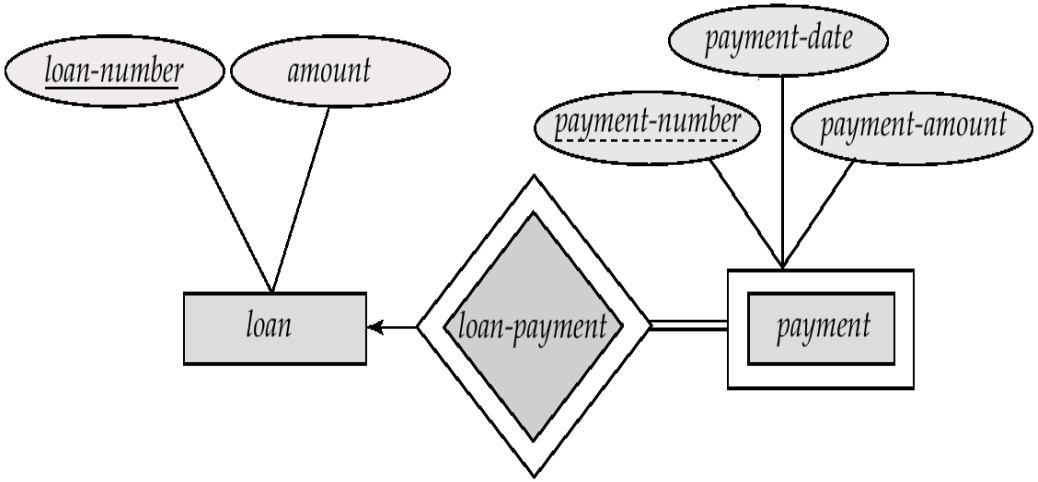
(b) How to get record with key = 18, and how many disk I/O are needed to get it?

(c) If we want to print out all records, at least, how many disk I/O are needed?

(d) In general, what are the advantages and disadvantages of using “index”?

Question 2: E-R Model ➔ Tables (20%)

- E.g. Consider **weak entity *payment*** that depends on entity ***loan***



a) Draw a relational table for entity *loan*

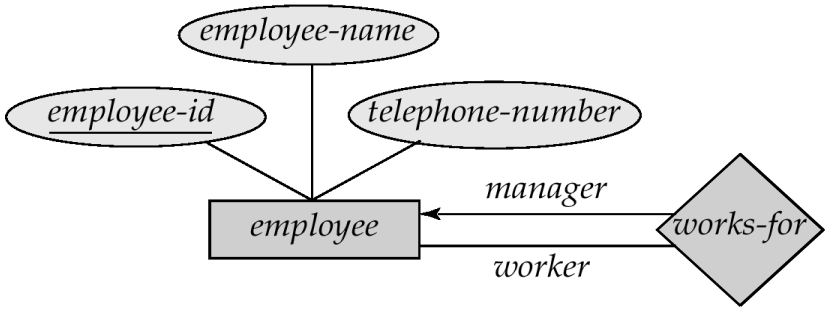
a) What is the primary key for your table *laon*?

b) Draw a relational table for weak entity *payment*

c) What is the primary key for your table *payment*?.

Question 3: Entity Sets vs. Attributes (10%)

- Consider a **Entity Set**: *employee*
  - with attributes (*employee-id*, *employee-name*, *telephone-number*)



  - Case 1: telephone-number as an attributes
  - Case 2: Create a entity set: telephone

a) Discuss case 1 之優缺點

b) Discuss case 2 之優缺點

Question 4: Explain Terms (20%)

- **Explain the following terms**
  a) blob
  b) clob
  c) Logical database design
  d) **grant** <privilege list> **on** <relation name/view name> **to** <user list>
  e) EXEC SQL <embedded SQL statement > END-EXEC
  f) Specialization vs. Generalization in E-R diagram
  g) UML Diagram
  h) Update Anomalies!

Question 5: Referential Integrity (15%)

```
create table account
   (account-number      char(10),
    branch-name         char(15),
    balance             integer,
    primary key (account-number),
    foreign key (branch-name)  references branch
                                on delete set null
                                on update cascade
   )
```

a) When we delete a tuple in ***branch,***
eg. Brighton Broklyn 7100000,
what will happen in ***account***?

b) When we update the first tuple in ***branch,***
eg. Donghwa Broklyn 7100000,
what will happen in ***account***?

c) When we delete the first tuple in ***account,***
what will happen in ***branch***?

5. account

account-number	*branch-name*	*balance*
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

references

1. branch

branch-name	*branch-city*	*assets*
Brighton	Brooklyn	7100000
Downtown	Brooklyn	9000000
Mianus	Horseneck	400000
North Town	Rye	3700000
Perryridge	Horseneck	1700000
Pownal	Bennington	300000
Redwood	Palo Alto	2100000
Round Hill	Horseneck	8000000

Question 6: About Your Final Term Project (15%)

- **According to your final project as "Design and implement a useful database application system"**
  a) What is the title of your project?
  b) Names of members in your team.
  c) Draw the E-R Diagram of your application system. (You can just give a similar diagram.)
  d) Draw a table to show one relation used in the system
  e) Check your answer in d) to see whether it is in the 1NF? Why? Please answer "why" by using the definition of the 1NF.
  f) Same as e) to see whether it is in the 2NF? Why?
  g) Same as e) to see whether it is in the 3NF? Why?