

1. Consider the given relational database.

(1) Please find the ER diagram for this database. (5%)

(2) Please translate the SQL statement into a sequence of SELECT, PROJECT, and JOIN operations. (15%)

Select JOB.JobTitle from ASSIGNMENT, JOB

where ASSIGNMENT.JobId=JOB.JobId and ASSIGNMENT.EmplId= "34Y70".

EMPLOYEE relation

Empl Id	Name	Address	SSN
25X15	Joe E. Baker	33 Nowhere St.	111223333
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555
⋮	⋮	⋮	⋮

JOB relation

Job Id	Job Title	Skill Code	Dept
S25X	Secretary	T6	Personnel
S26Z	Secretary	T8	Accounting
F5	Floor manager	FM3	Sales
⋮	⋮	⋮	⋮

ASSIGNMENT relation

Empl Id	Job Id	Start Date	Term Date
23Y34	S25X	3-1-1999	4-30-2001
34Y70	F5	10-1-2002	⋮
23Y34	S26Z	5-1-2001	⋮
⋮	⋮	⋮	⋮

2. Please answer the multiple-choice questions. (10%)

(1) A bridge operates at _____ layer of the OSI model.

- (a) the first layer (b) the first two layers (c) the first three layers (d) all layers.

(2) Which topology needs cable terminators?

- (a) bus (b) ring (c) star (d) all of the above

(3) A _____ is a connecting device that acts as a protocol converter.

- (a) repeater (b) bridge (c) router (d) gateway

(4) Kate's Irish Potato Company is based in Ireland but has branches in Boston and San Francisco. The branches communicate with each other through a _____.

- (a) LAN (b) MAN (c) WAN (d) none of the above.

(5) The _____ layer of the OSI model encrypts data.

- (a) physical (b) data-link (c) session (d) presentation.

本試題雙面印製

淡江大學 97 學年度碩士班招生考試試題

86-2

系別：資訊工程學系

科目：資 訊 概 論

本試題共 2 頁，7 大題

3. A digital signature provides for data integrity and a MAC (message authentication code) provides for data integrity.

A signature also provides for non-repudiation, while a MAC does not. Why not? (10%)

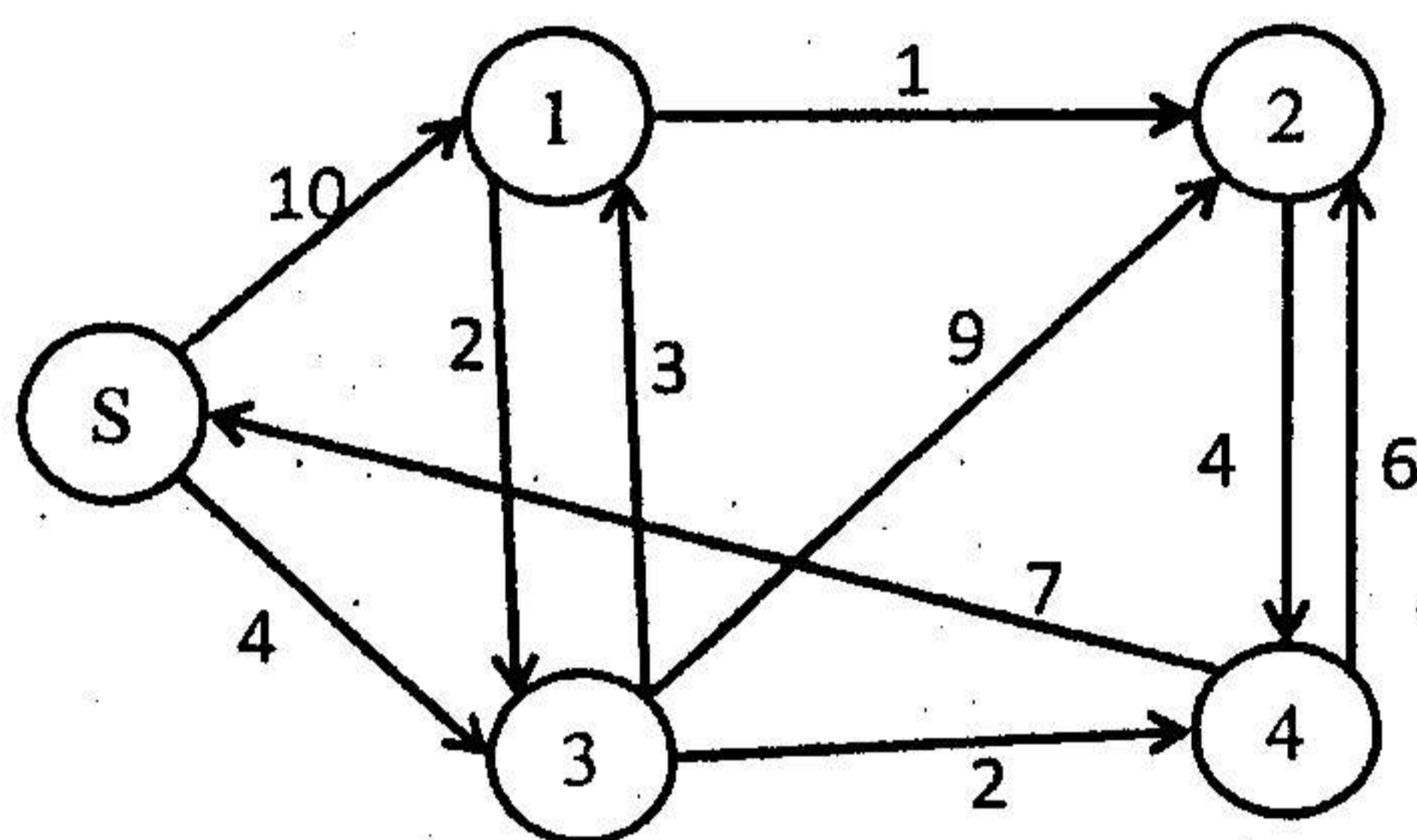
4. Please sort the input {40, 80, 35, 90, 45, 50, 70} by using the Heap sort algorithm. (15%)

5. Consider the following weighted directed graph.

(1) Please find the adjacency-matrix representation of the given directed graph. (5%)

(2) Please use Dijkstra's algorithm to solve the single-source shortest-paths problem with the source vertex is s.

(15%)



6. The Halting Problems asks the question: Given a program and an input to the program, determine if the program will eventually stop with this input. Please prove that there is no algorithm used to solve the Halting problem.

(20%)

7. Consider the circular queue using an array $q[0, n-1]$ and two variables front and rear. The variable front always points one position counterclockwise from the first element in the queue. The variable rear always points the position of the last element in the queue. Elements are inserted by increasing the variable rear to the next free position. Please give your way to check whether or not the circular queue is empty or full. Explain your answer briefly. (5%)