

# Khyber Pakhtunkhwa Public Service Commission

## Competitive Examination for Provincial Management Service 2010

### Computer Science

Time Allowed: 03 Hours

Max. Marks: 100

Attempt total FIVE questions, with at least ONE question from each section.  
Each question carries 20 marks.

#### Section A

##### Question No. 1

- What is a Binary Semaphore? What is its use?
- List the Coffman's conditions that lead to a Deadlock.
- What is a PCB? What are the typical elements of a process image?

##### Question No. 2

- List out some reasons for: Process Creation, Process Suspension, Process Termination.
- What is an Instruction Set? How can Pipelining improve the performance of a processor?

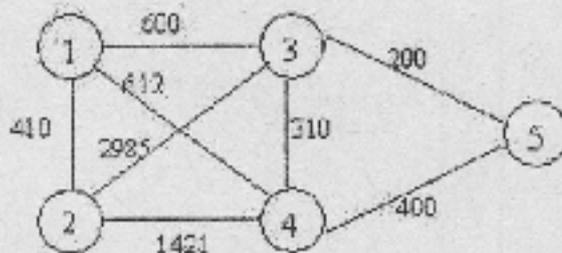
##### Question No. 3

- What is CSMA/CD and CSMA/CA and how do they differ? What layer 2 protocols use these techniques?
- What is the fundamental difference between Hubs, Bridges and Routers?

#### Section B

##### Question No. 4

- Draw a Binary Tree for the expression:  $A * B - (C - D) * (P / Q)$ .
- What is a Spanning Tree? Convert the given graph with weighted edges to minimal spanning tree.



### Question No. 5

- A. An integer number is said to be a perfect number if the sum of its factors, including 1 (but not the number itself), is equal to the number. For example, 6 is a perfect number, because  $6 = 1 + 2 + 3$ . Write a function *perfect* that determines whether parameter number is a perfect number. Use this function in a program that determines and prints all the perfect numbers between 1 and 1000. Print the factors of each perfect number to confirm that the number is indeed perfect.
- B. Write a program that implements **Linear Search** first using iterative function and then using recursive function.

## Section C

### Question No. 6

- A. Briefly describe with concrete examples the Key Constraint, Domain Constraint, Entity Integrity Constraint and Referential Integrity Constraint in Relational Model.
- B. Define Latency, Transfer and Seek Time with respect to disk I/O.

### Question No. 7

Differentiate between the following:

- A. Client-side and Server-side technologies
- B. B2B and B2C ecommerce models
- C. Proxy Server and Firewall
- D. Web Server and Web Client

### Question No. 8

What is the role of Information and Communication Technologies in the following areas?

- A. Tourism
- B. Education
- C. Government
- D. Counter Terrorism