一. Multiple-choice questions (30%)

1. _____ is a set of instructions in a computer language that tells the computer what to do with data.
   A. An operation system
   B. An algorithm
   C. A data processor
   D. A program

2. A step-by-step solution to a problem is called _____
   A. Hardware
   B. An operation system
   C. A computer language
   D. An algorithm

3. The bitmap graphic method and the vector graphic method are used to represent _____ in a computer.
   A. Audio
   B. Video
   C. Images
   D. Numbers

4. When you want to download music to a computer, the audio signal must be _____.
   A. Sampled
   B. Quantized
   C. Coded
   D. All of the above

5. There are ____ bytes in 16 terabytes.
   A. $2^{16}$
   B. $2^{40}$
   C. $2^{44}$
   D. $2^{58}$

6. Through the ____ layer of the OSI model, mail services and directory services are available to network users.
   A. Data connection
   B. Session
   C. Transport
   D. Application

7. The IP address is currently ____ bits in length.
   A. 4
   B. 8
   C. 32
   D. Any of the above

8. In paging, a program is divided into equally sized sections called _____.
   A. Pages
   B. Frames
   C. Segments
   D. Partitions
9. If C and D are two adjacent vertices in an undirected graph, then ____.
   A. There are two paths
   B. There is just one path \{C, D\}
   C. There is just one path \{D, C\}
   D. There are no paths

10. If there are 16 nodes to be stored in a binary tree, the minimum height of the tree is ____.
    A. 16
    B. 5
    C. 4
    D. 1

二．Please describe how to measure “Software Quality” and identify the possible factors. (15%)

三．Which of the OSI layers is (are) involved in each of the following activities: (15%)
   A. sending a frame to the next station
   B. sending a packet from the source to the destination
   C. sending a long message from the source to destination
   D. logging into a remote computer
   E. encrypting and decrypting data

四．Write a recursive algorithm to find the combination of n objects taken k at a time using the following definition. (10%)
   \[ C(n, k) = \begin{cases} 
   1 & \text{if } k=0 \text{ or } n=k \\
   C(n-1, k) + C(n-1, k-1) & \text{if } n>k>0 
   \end{cases} \]

五．Draw a graph for the adjacency matrix representation in figure below: (10%)

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<th>A</th>
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<th>C</th>
<th>D</th>
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六．You have two arrays, A and B, each of 10 integers. Write an algorithm that tests if every element of array A is equal to its corresponding element in array B. (10%)

七．In some country, the vehicle license plates have two decimal digits(0 to 9) followed by three uppercase letters (A to Z). How many distinct plates can you have? If the digit 0 is not allowed on the license plate, how many distinct plates can you have? (10%)

