

# 國立中央大學 105 學年度碩士班考試入學試題

所別： 土木工程學系 碩士班 資訊應用組(一般生)

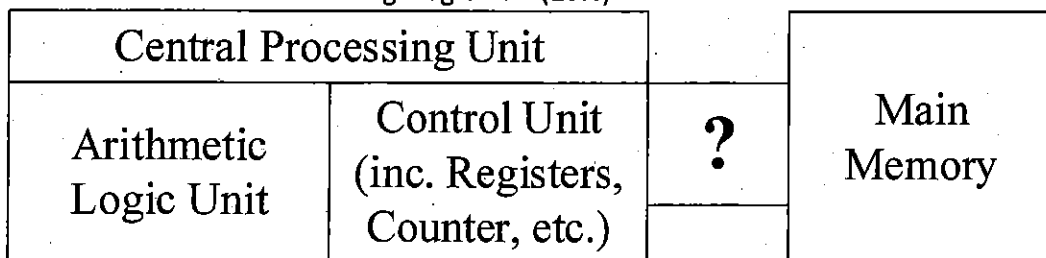
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科目： 計算機概論

本科考試可使用計算器，廠牌、功能不拘

\*請在答案卷(卡)內作答

1. Please write in binary notation the number 1976 (base 10). (2%)
2. Please write in binary notation the real number 0.671875 (base 10). (8%)
3. Regarding Huffman Encoding: Suppose that we want to use binary notation to represent the string "AAABBBBAABCAAAAABD". (15%)
  - (1) Please show the count occurrence of each character.
  - (2) Please build a Huffman tree.
  - (3) Please use the tree to represent the given string.
4. Please indicate the name and describe the functionality of the component labelled "?" in the following diagram. (10%)



5. Please describe the machine cycle, which includes FETCH, DECODE, and EXECUTE. (10%)
6. Please explain the following terms: (35%)
  - (1) Semaphores
  - (2) IPv4
  - (3) IPv6
  - (4) IP
  - (5) TCP
  - (6) UDP
  - (7) OSI 7-layer model
7. Please explain the Public/Private Key mechanism to securely transmit information on Internet. (10%)
8. Please explain why your mobile phone can approximately show the current physical address of the device, by using a WiFi connection. (10%)