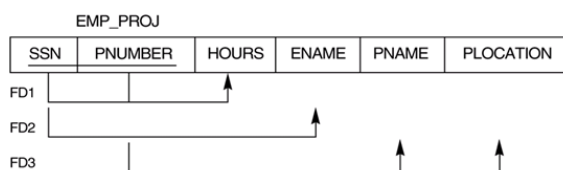注意：　**1. 請*勿*用鉛筆作答。不可使用任何字典。2. 手機關機且收藏妥當，不得置於桌面**
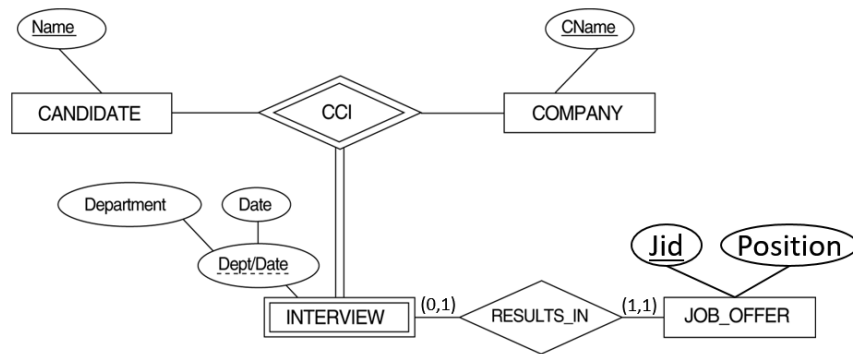　　　　**3. 請注意作答文句的通順與完整；詞不達意或作答不完整，會被扣分**

1. Which database programming method requires a preprocessor to convert SQL statement into a host language? (5%)
   (a) Embedded/Dynamic SQL. (b) Call level interface.
   (c) Stored procedures and functions. (d) Function calls.

2. Which is one of the advantages of the embedded SQL approach? (5%)
   (a) Program is more readable. (b) Syntax error are checked at compile time.
   (c) No impedance mismatch. (d) Flexibility.

3. Define the following terms: (20%)
   (a) Normalization (b) Functional Dependency (c) Recursive relationship type (d) Numeric array in PHP

4. What is the result of the PHP statement: print ucwords(strtolower ('JOHN smith'))? (5%)

5. Please explain the differences between ER model and EER model. What additional concepts does the EER model include? (5%)

6. R is in 3NF if whenever a FD X→Y holds in R, then (a) X is a superkey of R or (b) Y is a prime attribute of R. What is the definition of BCNF (Boyce-Codd Normal Form)? (5%)

7. What are the incompatibilities between a host programming language and the DB model, i.e., impedance mismatch? (5%)

8. Please explain the difference between a category (or UNION TYPE) and a shared subclass. (10%)

9. The relation EMP_PROJ is not a good relation. Please explain how this relation will cause (a) insert anomaly and (b) delete anomaly. (10%)

10. Please normalize the above EMP_PROJ relation to 2NF. (10%)

(背面有試題…)

11. Please map the following ER schema to a set of relations. (10%)

12. Please generalize the following to two schemas into one EER schema with a superclass VEHICLE and two subclasses CAR and TRUCK. (10%)