Your answers should be a coherently written essay that flows and reads similar to a technical paper. Please submit hard copy on the due date in class. If you cannot make it to class on the due date submit via email to xzhang6@gmu.edu or fax to 270-398-5872 before 10/19 class meeting.

All questions have equal score. Answer five (5) of the following questions. If you answer more than 5, I count the highest ones.

1. Consider RBAC0 only in this question. In RBAC96, users are allowed to activate and deactivate roles at their discretion. Any number of roles can be concurrently active in a session. Consider the following alternatives.
   a. RBACA: RBAC0 except that all roles are activated automatically.
   b. RBACB: RBAC0 except that only one role can be activated in a session at anytime. But a user can active any role that is necessary.

   Explain the main difference between RBAC0, RBACA, and RBACB.

2. Separation of duties is traditionally concerned with the regular roles in the organization. Consider application of separation of duties to administrative roles. Discuss what kinds of separation of duties may be useful in the context of administrative roles.

3. Discuss the pros and cons of storing authorization information in X.509 certificate extensions versus using separate attribute certificates.

4. Why URA97 and PRA97 revocation model do not include conditions. Give at least two examples that condition is useful for revocation.

5. Compare the different UCON architectures with metrics of policy definition flexibility (e.g., fine-grained policy supporting), policy revocation (e.g., describe what kind of policy revocation can be supported, and how can be implemented in each architecture.), enforcement efficient, and allowing off-line access or not.

6. Give an example that is most suitable for each of the fixed-control, embedded-control, and external-control architecture. Argue why it is not suitable with other architectures.

7. Map the Windows RMS into one of the most suitable UCON architectures we discussed. Explain your mapping.

Your answers MUST not exceed four(4) pages totally.