**Part I: Answer the following questions**

1. What are the differences among shell, kernel and API (Application Program Interface)?

2. What are the differences among file, program and process?

3. What are the UNIX philosophies?

4. What are the UNIX attributes? Part II: Regular Expression

**Part II: Regular Expression**

1. Chose match(es) for each given regular expression (maybe multiple correct matches)

e.g. ‘ab+a’ a) ababa b) aba c)abba d)aabbaa e)aa

Answer:b,c (Because matched string should begin and end with ‘a’ and ‘b’ occurs at least once between leading and ending ‘a’)

1) ‘a(ab)\*a’ (a)ababa (b) aaba (c) aabab (d) aabbaa (e)aa

2) ‘a(bc){1,5}’ (a) abcbc (b) abcb (c) abb (d) bcbc (e)abcbcbc

3) ‘(a|b)\*c’ (a) abbc (b) aabc (c) abab (d) c (e)abb

4) ‘a.[bc]+’ (a)azbc (b) az (c) azbcbc (d) acc (e)acz

5) ‘a.[0-9]’ (a)azz (b) a0z (c) a01 (d) a0a (e)aza

6) ‘[a-z]+[\.\?!]’ (a)good! (b) Book. (c) hard? (d) cool?hot (e)nothing

7) ‘[a-z]+[\.\?!]\s \*[A-Z]’ (hint: \s matches any space character and )

(a)Grade. A (b) book. Z (c) E. G (d) Level. a (e)index?a

8) ‘(very )+(cool )?(good|bad) weather’ (

a)good weather (b) very good weather (c) cool weather (d) very cool bad weather (e)cool good weather

9) ‘-?[0-9]+’

(a)3312 (b) -2231 (c) +32 (d) 0.5 (e)2/3

10) ‘-?[0-9]\*\.?[0-9]\*’

(a)3312 (b) -2231 (c) +32 (d) 0.5 (e)2/3

2. Write down the regular expression for following questions (3 points for each):

E.g. Social security number in the format of 999-99-9999.

Answer: [0-9]{3}-[0-9]{2}-[0-9]{4}

1) Valid URL beginning with “http://”. (e.g. <http://cs.gsu.edu>)

2) GSU panther ID in the format of 999-99-999. (e.g. 001-92-5434)

3) Valid email address, assuming ‘ a-z’,’0-9’,’-‘,’.’ are valid characters for user id and domain name has to be end with either “.com” or “.net” (e.g. aabb-123.xy@g3.com, [cdcd@12-3.net](mailto:cdcd@12-3.net))

4) Phone number in any of the following format: 999-9999999,999- 999-9999, (999)-9999999.