Department of Accounting
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Ph.D. Qualifying Exam- Managerial Accounting
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PART 2

1. A risk neutral principal employs an agent who can produce two levels of output: X1 that yields a profit of $100,000 before paying the agent's wages and output X2 that generates a profit of $200,000 before paying the agent's wages. The agent can provide either high effort (e=H) or low effort (e=L). The principal can not observe effort but can observe the level of output and profits. The effort conditional probabilities are:

	X1	X2
High Effort (H)	0.2	0.8
Low Effort (L)	0.8	0.2

The agent's reservation utility is 80 and his separable utility function is defined over wages (W) and effort (e) in the form of:

U(W, e)=w $w^{1/2} - V(e)$,

where V(e) is cost of personal effort, with V(H)=67 and V(L)=22

Require:

(1) Determine the optimal wage contract for the principal to offer the agent to ensure high effort. **(10%)**

(2) Check that encouraging high effort is most profitable for the principal. **(3%)**

(3) Explain how you think the optimal incentive package (the wages you have determined) might change if the effort conditional probabilities changed to:

	X1	X2
High Effort (H)	0.25	0.75
Low Effort (L)	0.75	0.25

Assume everything else stays the same.

Explain the implication of this change. **(10%)**

2. The usual total cost function for a firm in economic can be written as:

C(w, y)= $\sum_{1}^{N} c_i(w, y_i) + F$ equation(1)

Where w is a vector of input prices, j=1,…….M; y is a vector of product volumes, i=1,……..N, subscripts index products and F represents fixed costs. Similarly, the

usual total cost function using Activity Based Costing (ABC) can be represented as:

$c(w, y)\sum_{1}^{K} c^k y_i(w, y_i) + F$ equation(2)

Where $c^k y_i(w, y_i)$ represents the cost of product j in cost pool k, j=1,…..,K and F comprises non-assigned fixed and joint costs.

Required:

(1) Derive the incremental cost of product j from equation (1). **(3%)**

(2) Show that the activity based cost of product j in expression (2) can represent the incremental cost of product j to the firm. **(3%)**

(3) Indicate the characteristics required of an activity cost pool for its cost function to yield the incremental cost of a product using the cost pool. **(3%)**

(4) Explain whether Activity Based Costing can incorporate costs of the following types: **(8%)**

(i) $c = c^k(p_k(a_k y))$

(ii) $c = c^k(p_k(y / a_k))$

(iii) $c = c(H) = H \; if \; y_i > 0$

(iv) $c = c(y_{i,} y_l) = L \; if \; y_i > 0, i = (i, l)$

Where H and L are constants, a_k is unit cost driver of cost pool k, k=1,…..K and p_k is cost pool charge out rate for cost pool k.

(5) Explain how costs of types (4) (iii) and (iv) can be handled outside the Activity Based Costing system if necessary. **(4%)**

(6) Explain the difference between cost of types (4) and the cost setting of Mishra and Vaysman (2001). **(6%)**