DAA, ASSIGNMENT- 4

Q-1

(1) 1.1 → the maximum element in the Array A [1... r] & j = r+1

(2) 2.4 → The while-statement is always executed n times.

Q2

(1) A [n-r+1, ... n]

(2) Sum contains value of Array [n-n+1, ..., n]

(∵ n=r at termination)

i.e, [1, ..., n]

H.P

Q3

(1) At r^{th} iteration,

(i) j = r+1

(ii) $p = x^r$

(2) at termination,

⇒ i = n+1

⇒ n = r

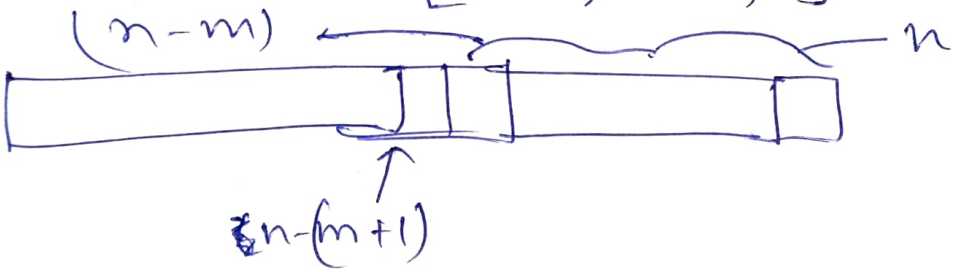
⇒ $p = x^n$

Q-4

(1) Input : Sorted Array A ; x
Output : array A (Sorted of updated) with value x in it.

(2) H(r) : when the control reaches the while statement for the rth time.
① $i = n - r$
② x is smaller than all the elements in array $A[n-r \ldots n]$

(3) * r-1 is true vacously
* Let H(r) be true for $r = m$
$\Rightarrow x \leq$ all elements in array $A[n-m, \ldots, n]$



Now, $x < A[n-m]$ {Strictly less}
bcoz x has reached $n-(m+1)$.
$\therefore x \leq$ all elements in array
$A[n-m-1, n-m, \ldots n]$
Hence, H(r) is true for $r = m+1$.

(4) Case 1 : $A[n-r] \leq x$
$A[i+1] = A[n-r+1]$ ← (correct pos of x

Case 2 : $i = 0$
$A[i+1] = A[i]$ ← (corr. pos of x as $x < \{A[0]\}$.