Primes, Factors & Multiples Mark Scheme

1. (a) 15 2

$75 = 3 \times 5 \times 5$
$90 = 2 \times 3 \times 3 \times 5$

M1 for the 3 prime factors (3, 5, 5) of 75
***OR** the 4 prime factors (2, 3, 3, 5) of 90*
[Alt: M1 for at least 3 factors in each list]
A1 cao

$HCF = 3 \times 5$

(b) 450 2

Using the above to give
$LCM = 2 \times 3 \times 3 \times 5 \times 5$

M1 for product of correct factors ($2 \times 3 \times 3 \times 5 \times 5$)
[Alt: M1 for at least 3 multiples in each list]
A1 cao
[SC: B1 for any common multiple of 75 and 90 but not 6750]
[SC: B2 for 15 and 450 reversed]

[4]

2. 36 2

$108 = 2 \times 2 \times 3 \times 3 \times 3$
$180 = 2 \times 2 \times 3 \times 3 \times 5$
$HCF = 2 \times 2 \times 3 \times 3$

M1 for 5 prime factors of 108 or 180
OR M1 for at least 3 factors in each list (factors must be > 1, condone 1 incorrect factor in each list)
A1 cao

[2]

3. 18 2

M1 for the prime factors (2, 3, 3, 3) of 54 or the 5 prime factors (2, 2, 2, 3, 3) of 72
(Alternative: M1 for at least 3 factors (>1) in each list. Condone one error in each list)
A1 cao

[2]

4. 18 2

$36 = 2 \times 2 \times 3 \times 3$
$54 = 2 \times 3 \times 3 \times 3$

M1 for 3 factors of each numbers (not inc. 1), condone one error
A1 cao
[or M1 for either $36 = 2 \times 2 \times 3 \times 3$ or $54 = 2 \times 3 \times 3 \times 3$]

[2]

5. (a) *7p* 1

B1

(b) (i) *xy* 3

B2 for xy
(B1 for any common factor)

(ii) x^2y^2

B1 for x^2y^2

[4]

6. (i) $2^3 \times 3^2$ oe 1

B1 for $2^3 \times 3^2$ oe

(ii) $2^4 \times 3^4 \times 5 \times 7$ oe 2

M1 for either 2^4 or 3^4 in a product of factors OR list of at least 3 correct multiples of each of 1008 and 3240
A1 cao
SC: B2 if both answers correct but reversed

[3]