Factorise the following (1 to 8) polynomials:

Question 1.

(i) $8xy^3 + 12x^2y^2$

(ii) $15ax^3 - 9ax^2$

Solution:

(i) $8xy^3 + 12x^2y^2 = 4xy^2 (2y + 3x)$

(ii) $15ax^3 - 9ax^2 = 3ax^2 (5x - 3)$

Question 2.

(i) $21\ py^2 - 56py$

(ii) $4x^3 - 6x^2$

Solution:

(i) $21\ py^2 - 56py = 7py (3y - 8)$

(ii) $4x^3 - 6x^2 = 2x^2 (2x - 3)$

Question 3.

(i) $25abc^2 - 15a^2b^2c$

(ii) $x^2yz + xy^2z + xyz^2$

Solution:

(i) $25abc^2 - 15a^2b^2c = 5abc (5c - 3ab)$

(ii) $x^2yz + xy^2z + xyz^2 = xyz(x + y + z)$

Question 4.

(i) $8x^3 - 6x^2 + 10x$

(ii) $14mn + 22m - 62p$

Solution:

(i) $8x^3 - 6x^2 + 10x = 2x (4x^2 - 3x + 5)$

(ii) $14mn + 22m - 62p = 2 (7mn + 11m - 31p)$

Question 5.

(i) $18p^2q^2 - 24pq^2 + 30p^2q$

(ii) $27a^3b^3 - 18a^2b^3 + 75a^3b^2$

Solution:

(i) $18p^2q^2 - 24\ pq^2 + 30p^2q$

$= 6pq\ (3pq - 4q + 5p)$

(ii) $27a^3b^3 - 18a^2b^3 + 75a^3b^2$

$= 3a^2b^2\ (9ab - 6b + 25a)$

Question 6.

(i) $15a\ (2p - 3p) - 106\ (2p - 3q)$

(ii) $3a\ (x^2 + y^2) + 6b\ (x^2 + y^2)$

Solution:

(i) $15a\ (2p - 3q) - 10b\ (2p - 3q)$

$= (2p - 3q)(15a - 10b)$

$= (2p - 3q)\ (5)\ (3a - 2b)$

$= 5\ (2p - 3q)\ (3a - 2b)$

(ii) $3a\ (x^2 + y^2) + 66\ (x^2 + y^2)$

$= (x^2 + y^2)\ (3a + 6b)$

$= (x^2 + y^2)\ (3)\ (a + 2b)$

$= 3\ (x^2 + y^2)\ (a + 2b)$

Question 7.

(i) $6(x + 2y)^3 + 8(x + 2y)^2$

(ii) $14(a - 3b)^3 - 21p(a - 3b)$

Solution:

(i) $6(x + 2y)^3 + 8(x + 2y)^2$

$(x + 2y)^2 [6 (x + 2y) + 8]$

$= (x + 2y)^2 [6x + 12y + 8]$

$= (x + 2y)^2 (2) (3x + 6y + 4)$

$= 2 (x + 2y)^2 (3x + 6y + 4)$

(ii) $14(a - 3b)^3 - 21 p(a - 3b)$

$= 7 [2 (a - 3b)^3 - 3p(a - 3b)]$

$= 7 [(a - 3b) \{2 (a - 3b)^2 - 3p\}]$

$= 7 (a - 3b) [2 (a - 3b)^2 - 3p]$

Question 8.

$10a (2p + q)^3 - 15b (2p + q)^2 + 35(2p + q)$

Solution:

$10a (2p + q)^3 - 15b (2p + q)^2 + 35(2p + q)$

$= 5 [2a (2p + q)]^3 - 3b (2p + q)^2 + 7 (2p + q)$

$= 5(2p + q) [2a (2p + q)^2 - 3b(2p + q) + 7]$