Q1. Expand each of the following using suitable identities :

(i) $(x+2y+4z)^2$ (ii) $(2x-y+z)^2$ (iii) $(-2x+3y+2z)^2$ (iv) $(3a+4b+5c)^2$

(v) $(3a-7b-c)^2$ (vi) $(4a-2b-3c)^2$ (vii) $(-2x+5y-3z)^2$ (viii) $\left[\frac{1}{4}a-\frac{1}{2}b+1\right]^2$

Ans. 1 (i) $x^2+4y^2+16z^2+4xy+16yz+8xz$ (ii) $4x^2+y^2+z^2-4xy-2yz+4xz$

(iii) $4x^2+9y^2+4z^2-12xy+12yz-8xz$ (iv) $9a^2+16b^2+25c^2+24ab+40bc+30ac$

(v) $9a^2+49c^2+c^2-42ab+14bc-6ac$ (vi) $16a^2+4b^2+9c^2-16ab+12bc-24ac$

(vii) $4x^2+25y^2+9z^2-20xy-30yz+12xz$ (viii) $\frac{a^2}{16}+\frac{b^2}{4}+1-\frac{ab}{4}-b+\frac{a}{2}$

Q2. Factorise :

(i) $9x^2+6xy+y^2$ (ii) $16x^2+24xy+9y^2$ (iii) $9x^2-6xy+y^2$ (iv) $4y^2-4y+1$

(v) $25a^2-40ab+16b^2$ (vi) $49p^2-112pq+64q^2$ (vii) $\frac{25}{4}x^2-\frac{200}{9}xy+\frac{16}{9}y^2$

(viii) $7x^2+10\sqrt{7}x+25$ (ix) $49a^2+70ab+25b^2$ (x) x^2-16 (xi) $25x^2-9y^2$ (xii) $x^2-\frac{y^2}{100}$

(xiii) $81a^2-49b^2$ (xiv) $\frac{25}{4}x^2-\frac{y^2}{9}$

Ans. 2 (i)

Q3. Factorise :

(i) $4x^2+9y^2+16z^2+12xy-24yz-16xz$ (ii) $9a^2+16b^2+25c^2+24ab+40bc+30ac$

(iii) $16a^2+4b^2+9c^2-16ab+12bc-24ac$ (iv) $4x^2+25y^2+9z^2-20xy-30yz+12xz$

(v) $2x^2+y^2+8z^2-2\sqrt{2}xy+4\sqrt{2}yz-8xz$ (vi) $3x^2+12y^2+z^2-12xy+4\sqrt{3}yz-2\sqrt{3}xz$

Q4. Factorise :

(i) $8a^3+b^3+12a^2b+6ab^2$ (ii) $8a^3-b^3-12a^2b+6ab^2$ (iii) $27-125a^3-135a+225a^2$

(iv) $64a^3-27b^3-144a^2b+108ab^2$ (v) $27p^3-\frac{1}{216}-\frac{9}{2}p^2+\frac{1}{4}p$ (vi) $8x^3+27y^3+36x^2y+54xy^2$