Exercise 1.1

Q1 $4 \times 3 \times 5 = 60$ ways

Q2 $6 \times 7 = 42$ ways

Q3 $\boxed{26} \times \boxed{9} \times \boxed{8} = 1872$

Q4 $10 \times 6 \times 4 = 240$ ways

Q5 $6! = 720$

Q6 $7! = 5040$

$6! \times 2! = 1440$

Q7 $5! = 120$

(i) $\boxed{1} \times \boxed{4} \times \boxed{3} \times \boxed{2} \times \boxed{1} = 24$

(ii) $\boxed{1} \times \boxed{3} \times \boxed{2} \times \boxed{1} \times \boxed{1} = 6$

Q8 PROBLEM $= 7! = 5040$

(i) $\boxed{2} \times \boxed{6} \times \boxed{5} \times \boxed{4} \times \boxed{3} \times \boxed{2} \times \boxed{1} = 1440$

(ii) $\boxed{6}\ \boxed{5}\ \boxed{4}\ \boxed{3}\ \boxed{2}\ \boxed{1} \times 2! = 1440$

Q9 PRINCE $6! = 720$

(i) $4 \times 5! = 480$

(ii) $5! \times 2! = 240$

(iii) $5! \times 2! = 240$

Q10 LEAVING $7! = 5040$

(i) $1 \times 6! = 720$

(ii) $6! \times 2! = 1440$

Q11 IRELAND $7! = 5040$

$5! \times 3! = 720$

Q12 (i) $5! \times 3! = 720$.

Take 3 girls together as 1 unit $\Rightarrow$ 5 choices, $5!$

Then consider the order the girls sit in, $3!$

(ii) 3 Girls 4 boys $\Rightarrow$ Boy Must be First

$[4] \times [3] \times [3] \times [2] \times [2] \times [1] \times [1]$

$= 144.$

Q13 ${}^7P_4 = 7 \times 6 \times 5 \times 4 = 840$

Q14 ${}^6P_4 = 6 \times 5 \times 4 \times 3 = 366$

Q15 ${}^8P_3 = 8 \times 7 \times 6 = 336$

Q16 $[5] \times [4] \times [9] \times [8] = 1440$

Q17 $9 \times 8 \times 7 = 504$ 3 digit N°'s

$9 \times 9 \times 8 = 648$ 3 digit N°'s

zero cannot be first.

Q18 $4 \times 3 \times 2 \times 1 = 24$ 4 digit N°'s

(i) $1 \times 3 \times 2 \times 1 = 6$ greater than 7000

(ii) $3 \times 2 \times 1 \times 1 = 6$ end in a 7

(iii) $2 \times 3 \times 2 \times 1 = 12$ are less than 6000

Q19 $9 \times 9 \times 8 \times 7 = 4536$ 4 digit N°'s

(i) $2 \times 9 \times 8 \times 7 = 1008$ are greater than 8000

(ii) $9 \times 8 \times 7 \times 1 = 504$

↑ must end in a zero

Q20 $3 \times 4 \times 3 \times 2 = 72$ 4 digit N°'s greater than 5000

odd ⇒ ends with 5 or 9.

Greater than 5000 and odd.

[3] [ ] [ ] [ ]

↑ choice of 2 but may have used one already ?? Do Separately.

→ How Many of These odd.

start with 5 ⇒ $1 \times 3 \times 2 \times 1 = 6$

" " 8 ⇒ $1 \times 3 \times 2 \times 2 = 12$

" " 9 ⇒ $1 \times 3 \times 2 \times 1 = 6$

Total = 24 are odd.

Q21 $5 \times 5 \times 4 = 100$ 3 digit N°'s

(i) $3 \times 5 \times 4 = 60$ greater than 600

(ii) $1 \times 5 \times 4 = 20$ begin with 1

Q22 (i) $5 \times 5 \times 4 \times 3 = 300$ codes

(ii) $1 \times 5 \times 4 \times 3 = 60$ codes

Q23 $3! \times 3! = 36$ codes

Q24 $\boxed{9} \times \boxed{8} \times \boxed{7} \times \boxed{1} \times \boxed{6} \times \boxed{5} \times \boxed{4}$
$= 60480$

Q25 $7! = 5040$

(i) $6! \times 2! = 1440$

(ii) $5040 - 1440 = 3600$

Q26 $10 \times 9 \times 8 = 720$ ways

(i) $8 \times 7 \times 6 = 336$ ways

(ii) $3 \times 2 \times 8 = 48$ ways.

3 choices: Smith / Jones / other

2 choices

any of others