CSM 166

ASSIGNMENT ONE

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INDEX NUMBER: 4217720

GROUP: B

EXERCISE A

i) The expansion that gives xyz^2

$= -24xyz^2$

The coefficient is therefore **-24**

ii) The expansion that gives xyz^{-2}

$=\frac{4!}{1!1!2!} * (x)(-2y)(-3z^{-1})^2$

$=-216xyz^{-2}$

The coefficient is therefore =**216**

iii) The expansion that gives $w^3x^2yz^2$

$=\frac{8!}{3!2!1!2!} * (2w)^3(-x)^2(3y)(-2z)^2$

$=161280\ w^3x^2yz^2$

The coefficient is **161280**

iv) The expansion that gives $x^{11}y^4z^2$

$=\frac{6!}{3!2!1!} * (2x^3)^3(-3xy^2)^2(z^2)$

$=4320\ x^{11}y^4z^2$

The coefficient of $x^{11}y^4z^2$ is therefore **4320**

v) The expansion that gives $x^3y^4z^5$

$=\frac{12!}{3!4!5!} * (x)^3(-2y)^4(3z)^5$

$=107775360\ x^3y^4z^5$

The coefficient of $x^3y^4z^5$ is therefore **107775360**

EXERCISE B

1) The number of permutations of the word B,C,E,E,N,R,S,S,Y,Z,Z,Z,Z is $\frac{13!}{2!2!4!}$

$= 64864800$

The probability of arranging the letters of the word B,C,E,E,N,R,S,S,Y,Z,Z,Z,Z to form SZCZEBRZESZYN = $\frac{2!2!4!}{64864800}$

$=\frac{\mathbf{1}}{\mathbf{675675}}$

2) $(x+y+z)^6 = x^6 + 6x^5y + 6x^5z + 15x^4y^2 + 30x^4yz + 15x^4z^2 + 20x^3y^3 + 60x^3y^2z + 60x^3yz^2 + 20x^3z^3 + 15x^2y^4 + 60x^2y^3z + 90x^2y^2z^2 + 60x^2yz^3 + 15x^2z^4 + 6xy^5 + 30xy4z + 60xy^3z^2 + 60xy^2z^3 + 30xyz^4 + 6xz^5 + y^6 + 6y^5z + 15y^4z^2 + 20y^3z^3 + 15y^2z^4 + 6yz^5 + z^6$

$$(0.9)^6 = (0.3+0.3+0.3)^6$$

$$\begin{aligned}
= \quad & (0.3)^6 + 6(0.3)^5(0.3) + 6(0.3)^5(0.3) \\
& + 15(0.3)^4(0.3)^2 + 30(0.3)^4(0.3)(0.3) \\
& + 15(0.3)^4(0.3)^2 + 20(0.3)^3(0.3)^3 \\
& + 60(0.3)^3(0.3)^2(0.3) + 60(0.3)^3(0.3)(0.3)^2 \\
& + 20(0.3)^3(0.3)^3 + 15(0.3)^2(0.3)^4 \\
& + 60(0.3)^2(0.3)^3(0.3) + 90(0.3)^2(0.3)^2(0.3)^2 \\
& + 60(0.3)^2(0.3)(0.3)^3 + 15(0.3)^2(0.3)^4 \\
& + 6(0.3)(0.3)^5 + 30(0.3)(0.3)^4(0.3) \\
& + 60(0.3)(0.3)^3(0.3)^2 + 60(0.3)(0.3)^2(0.3)^3 \\
& + 30(0.3)(0.3)^4(0.3) + 6(0.3)(0.3)^5 + (0.3)^6 \\
& + 6(0.3)^5(0.3) + 15(0.3)^4(0.3)^2 + 20(0.3)^3(0.3)^3 \\
& + 15(0.3)^2(0.3)^4 + 6(0.3)(0.3)^5 + (0.3)^6
\end{aligned}$$

$$= \mathbf{0.5314}$$

3) MISSISSIPPI = 11 words

M= 1

I= 4

S=4

P=2

The number of permutations of MISSISSIPPI is $\frac{11!}{4!4!2!}$

=**34650 ways**