

## (Assignment no 1)

① (a) Favourable outcomes = 6 = (1,1) (2,2) (3,3) (4,4) (5,5) (6,6)

Total outcomes = 36

$P(\text{Both dice show same number}) = \frac{6}{36} = \boxed{\frac{1}{6}}$

⑤  $P(\text{first die show 6}) = (6,1) (6,2) \dots (6,6)$

$P = \frac{6}{36} = \boxed{\frac{1}{6}}$  Ans

⑥ (a) Total number > 8

(3,6) (4,5) (4,6) (5,4) (5,5) (5,6) (6,3) (6,4) (6,5) (6,6)  
= 10

$P = \frac{10}{36} = \boxed{\frac{5}{18}}$  Ans d

⑦ (a) Total number = 5

(2,6) (3,5) (4,4) (5,3) (6,2) = 5

$P(8) = \boxed{\frac{5}{36}}$  Ans e

⑧ (c)  $P(13) = 0$  Not possible.

2 (a) Since all of them are independent events so

$$\frac{4}{52} \times \frac{4}{51} \times \frac{4}{50} \times \frac{4}{49} = 0.0000394$$

(b)  $\frac{4C_2 \times 4C_2}{52C_4} = \frac{6 \times 6}{13 \times 52 \times 51 \times 50 \times 49 \times 48} = \frac{4 \times 3 \times 2 \times 1 \times 4 \times 3}{13 \times 52 \times 51 \times 50 \times 49 \times 48} = 0.000132$

(c)  $\frac{4C_2 + 4C_2}{52C_2} = \frac{0.01357 \times 12}{2 \times 52 \times 51} = 0.00969$

(d)  $\frac{13C_2 + 13C_2}{52C_2} = 0.058$

3 (a)  $\frac{6C_2 \times 13C_1}{19C_3} = \frac{5 \times 13}{15 \times 17} = \frac{0.2012 \times 6}{12 \times 4} = \frac{16}{15} = 1.066$

(b)  $\frac{6C_1 \times 4C_1 \times 9C_1}{19C_3} = \frac{6 \times 4 \times 9}{15 \times 17} = \frac{0.222 \times 1}{15 \times 17} = \frac{1}{3 \times 17} = 0.0196$

(c)  $\frac{15C_3}{19C_3} = \frac{105 \times 13}{35 \times 17} = \frac{15C_1}{15 \times 14 \times 13} = \frac{5 \times 7}{15 \times 14 \times 13} = 0.469$

④  $1 - P(\text{no wheel}) = 1 - \frac{{}^{13}C_3}{{}^{19}C_3} = \boxed{0.704}$  Ans

④ ②  $\frac{1}{2} \times \frac{28}{14} + \frac{1}{2} \times \frac{16}{30} = \frac{8}{28} + \frac{16}{60} = \frac{2}{7} + \frac{4}{15}$   
 $= \frac{30 + 28}{105} = \boxed{\frac{58}{105}}$  odds that both will not solve

⑤  $\frac{1}{2} \times \frac{6}{14} + \frac{1}{2} \times \frac{14}{30} = \frac{6}{28} + \frac{14}{60} = \frac{3}{14} + \frac{7}{30}$   
 $= \frac{45 + 49}{210} = \boxed{\frac{47}{105}}$  Both

⑤ they will contradict if one speak Truth and other speak lie.

⑥  $\frac{1}{3} \times \frac{1}{2} + \frac{1}{3} \times \frac{3}{4} + \frac{1}{3} \times \frac{1}{4} = \frac{1}{6} + \frac{3}{12} + \frac{1}{12} = \frac{6}{12} = \boxed{\frac{1}{5}}$

⑦  $P(F|U) = \frac{\frac{1}{2} \times 0.2}{0.2 \times \frac{1}{2} + \frac{1}{2} \times 0.05} = 0.8$   
 $P(M|U) = \frac{\frac{1}{2} \times 0.05}{0.2 \times \frac{1}{2} + \frac{1}{2} \times 0.05} = 0.2$