PROBABILITY 1

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Problem: Three coins are tossed once Find the probability of getting (i) 3 heads (ii) 2 heads (iii) at least 2 heads (iv) at most 2 heads (v) no head (vi) 3 tails (vii) exactly two tails (viii) no tail (ix) at most two tails

Solution: When three coins are tossed once the sample space is given by

$$S = HHH, HHT, HTH, THH, HTT, THT, TTH, TTT \tag{1}$$

$$n(s) = 8 \tag{2}$$

(i) Let B be the event of the occurrence of 3 heads Accordingly

$$B = HHH \tag{3}$$

$$P(B) = \frac{n(B)}{n(s)} = \frac{1}{8} \tag{4}$$

(ii) Let C be the event of the occurrence of 2 heads Accordingly

$$C = HHT, HTH, THH \tag{5}$$

$$P(C) = \frac{n(C)}{n(s)} = \frac{3}{8} \tag{6}$$

(iii) Let D be the event of the occurrence of at least 2 heads Accordingly

$$D = HHH, HHT, HTH, THH \tag{7}$$

$$P(D) = \frac{n(D)}{n(s)} = \frac{4}{8} \tag{8}$$

(iv) Let E be the event of the occurrence of at most 2 heads Accordingly

$$E = HHT, HTH, THH, HTT, THT, TTH, TTT \tag{9}$$

$$P(E) = \frac{n(E)}{n(s)} = \frac{7}{8} \tag{10}$$

(v) Let F be the event of the occurrence of no head Accordingly

$$F = TTT \tag{11}$$

$$P(F) = \frac{n(F)}{n(s)} = \frac{1}{8} \tag{12}$$

(vi) Let G be the event of the occurrence of 3 tails Accordingly

$$G = TTT \tag{13}$$

$$P(G) = \frac{n(G)}{n(s)} = \frac{1}{8} \tag{14}$$

(vii) Let H be the event of the occurrence of exactly 2 tails Accordingly

$$H = HTT, THT, TTH \tag{15}$$

$$P(H) = \frac{n(H)}{n(s)} = \frac{3}{8} \tag{16}$$

(viii) Let I be the event of the occurrence of no tail Accordingly

$$I = HHH \tag{17}$$

$$P(I) = \frac{n(I)}{n(s)} = \frac{1}{8} \tag{18}$$

(ix) Let J be the event of the occurrence of at most 2 tails Accordingly

$$J = HHH, HHT, HTH, THH, HTT, THT, TTH \tag{19}$$

$$P(J) = \frac{n(J)}{n(s)} = \frac{7}{8} \tag{20}$$