1.) $\frac{13}{2}$

~~P=56~~ Event J = Probability of getting a Jack card

$$P(J) = \frac{4}{52} = \boxed{\frac{1}{13}}$$

2.)

Mode of transportation	Number of Respondents	Probability
Car	200	$\boxed{0.4}$ (200/500)
Bicycle	100	$\boxed{0.2}$ (100/500)
Bus	150	$\boxed{0.3}$ (150/500)
Walking	50	$\boxed{0.1}$ (50/500)
	Total 500	Total 1.00 (500/500)

3.)

a. $P(A) = \frac{4}{36} = \boxed{\frac{1}{9}}$ or 0.11 $P(B) = \frac{21}{36} = \boxed{\frac{7}{12}}$ or 0.58 $P(C) = \frac{6}{36} = \boxed{\frac{1}{6}}$ or 0.167

$P(D) = \frac{3}{36} = \boxed{\frac{1}{12}}$ or 0.08

b. $P(A \cap B) \neq 0 \rightarrow \boxed{\text{not mutually exclusive}}$

since Event A is a ~~subset~~ included in of Event B, it is not mutually exclusive because all of the outcomes of Event A are part of Event B

so $P(A \cap B) \neq 0$

c. $\boxed{\text{mutually exclusive}}$

$P(A \cap B)$

$P(A) = \{(1,4), (2,3), (3,2), (4,1)\}$
$P(B) = \{(1,1), (2,2), (3,3), (4,4)\}$
$= P(A \cap B) = 0$

d. not collectively Exhaustive

Because not all events are not covered. Ex. (2,3) is not covered.

$P(B \cup D) \frac{2}{3} \neq 1$

$B = \frac{7}{12} + \frac{1}{12} * 0 = \frac{8}{12} = \boxed{\frac{2}{3}}$

e. not collectively Exhaustive | not collectivly exclusive exhaustive

since $(R \cup D) = 1$, it covers all possible outcomes

$= \frac{1}{6} + \frac{1}{12} - \frac{1}{36} = \frac{6}{36} + \frac{3}{36} * \frac{1}{36} = \frac{8}{36} \cong \frac{2}{9} \neq 1$