**Name of the Student**:_____
**Max. Marks : 26 Marks** **Time : 26 Minutes**

Mark Schemes

## Q1.

(a) any **two** from:

- wet / icy road conditions
  *ignore weather*
- poor condition of brakes
- poor condition of tyres
- increased mass of car
  *allow weight for mass*
- negative gradient of the road
  *allow going downhill*

**2**

(b) distance = speed × time

**1**

(so) longer reaction time = longer distance

**1**

(c) mean reaction time increases after drinking alcohol

**1**

the change in reaction time is not the same for all people after drinking alcohol

**1**

(d) distance = 1500 (m)

**1**

1500 = 20 × *t*
*allow a correct substitution using an incorrectly / not converted value of distance*

**1**

$t = \frac{1500}{20}$
*allow a correct rearrangement using an incorrectly / not converted value of distance*

**1**

75 (s)
*allow a correctly calculated value using an incorrectly / not converted value of distance*

**1**

Downloaded from www.merit-minds.com

(e) velocity is a vector and speed is a scalar

*allow velocity includes direction (speed does not)*

**1**

road is not straight

*allow driver may change lanes*

**1**

therefore direction changes so the velocity changes

**1**

**[13]**

## Q2.

(a) apply the force further away from the pivot

*do not allow increase the length of the lever*

**1**

(b) $v$ = 15 (m/s)

**1**

24 000 = $m$ × 15

*allow a value of v = 14.5 (m/s)*

**1**

$$m = \frac{24\,000}{15}$$

**1**

$m$ = 1600 (kg)

**1**

(c) distance travelled during first 3 seconds = 22.5 (m)

**1**

distance travelled during last 2 seconds = 30 (m)

**1**

total distance = 52.5 (m)

*allow 53 (m)*

*allow 1 mark for the correct addition of their calculated distances*

*allow a maximum of 2 marks for total distance = 50.75 (m) if velocity used = 14.5 (m/s)*

**1**

(d) stopping distance includes thinking distance

*allow stopping distance = braking distance + thinking distance*

**1**

there is an additional time before the driver applies the brakes.

*allow the driver's reaction time will increase (due to the distraction)*

**1**

(so) the thinking distance will increase

**1**

Downloaded from www.merit-minds.com

(e) work is done due to friction (in the brakes)
*ignore friction alone*

**1**

(causing) an increase in the internal / thermal energy (of the brakes)

**1**

**[13]**

Downloaded from www.merit-minds.com