Q1. (2018)

a)

06.1	thinking distance stays the same braking distance increases		1 1	AO1 6.5.4.3.3	

b)

06.2	reaction time is increased by using a mobile phone hand-held mobile phones increase the thinking distance more than hands-free phone by 4 m more than the hands-free phone so overall stopping distance increases	 allow thinking distance is increased by using a mobile phone allow **2** marks for a hand-held mobile phone doubles the increase of the thinking distance 	1 1 1 1	AO3 6.5.4.3.2	

Q2. (2019)

02.6	reduces the force exerted the risk of injury to gymnast is reduced	ignore impact allow so the gymnast does not get injured	1 1	AO3 6.5.4.2.2	E

Q3. (2019)

a)

04.1	(thinking distance) will double any correct pair of points from graph eg (200,6) and (400,12)	 allow graph shows direct proportionality (after 200 ms) allow **1** mark for thinking distance increases with supporting data.	1 1	AO3 6.5.4.3.2	E

b)

04.2	(most) people cannot react any quicker than 200 ms		1	AO1 6.5.4.3.2	E

Q4. (2019)

a)

04.4	(258+265+302+248+327) / 5 280 (ms)	an answer of 280 gains **2** marks	1 1	AO2 6.5.4.3.2	E

b)

04.5	8.4 (m)	allow 7.9 (m) to 8.9 (m) allow ecf from **04.4**	1	AO2 6.5.4.3.2	E

c)

04.6	any **two** from: • (material of) road surface • condition of the tyres • speed of the car • wet / icy road surface • gradient of road • mass / weight of the car	Ignore any reference to brakes	2	AO1 6.5.4.3.3

Q5. (2021)

03.1	taking drugs tiredness		1 1	AO1 6.5.4.3.2

Q6. (2021)

a)

03.2	24 (years)		1	AO3 6.5.4.3.2

b)

03.3	0.55 (s)	allow answer in range 0.54 to 0.56	1	AO3 6.5.4.3.2

Q7. (2021)

03.5	braking distance = $\frac{(12)^2}{(2 \times 3)}$ braking distance = 24 unit = m		1 1 1	AO1 AO2 AO2 6.5.4.1.5

Q8. (2021)

03.6	so they know how far behind another car they should drive **or** so they can stop safely if the car in front stops		1	AO3 6.5.4.3.3

Q9. (2022)

05.1	tiredness of the driver using a mobile phone		1 1	AO1 6.5.4.3.2

Q10. (2022)

05.2	increases reaction time		1	AO1
	so increases the thinking distance		1	AO1
	so more likely to have a collision	allow travels a greater distance before stopping (in an emergency)	1	AO3 6.5.4.3.2

Q11. (2022)

a)

05.3	23 m/s		1	AO2 6.5.4.3.2

b)

05.4	directly proportional	allow **1** mark for as speed increases thinking distance increases	2	AO3 6.5.4.3.2

c)

05.5	straight line from the origin with a greater gradient		1	AO2 6.5.4.3.2
	through (15,21)	allow a line that passes within half a small square of (15,21) dependent on MP1	1	

Q12. (2023)

a)

02.4	the brakes on the car can overheat		1	AO1 6.5.4.3.4
	the driver may lose control of the car		1	

b)

02.5	the greater the speed the greater the braking distance		1	AO1 6.5.4.3.1

Q13. (2024)

05.1	reaction time of the driver		1	AO1 6.5.4.3.1

Q14. (2024)

a)

05.2	(initial) speed	allow section of road used ignore condition of road without further qualification	1	AO3 6.5.4.3.3

b)

05.3	**Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.	5–6	AO3
	Level 2: Some logically linked reasons are given. There may also be a simple judgement.	3–4	AO3
	Level 1: Relevant points are made. They are not logically linked.	1–2	AO2
	No relevant content	0	
	Indicative content • tyre A braking distance is 30 m on dry road and 31 m on wet road • tyre A has the shortest braking distance on wet road • tyre B braking distance is 42 m on dry road and 43 m on wet road • tyre B has the longest braking distance on both wet and dry road • tyre C braking distance is 29 m on dry road and 40 m on wet road • tyre C has the shortest braking distance on dry road • the difference between braking distance on wet and dry roads for tyre A and tyre B is 1m • the difference between braking distance on wet and dry roads for tyre C is 11m **<u>Judgements</u>** • the shorter the braking distance the safer the tyre • tyre A is 1 m longer on dry road, but is 9 m shorter on wet road than tyre C • tyre A has the shortest combined / average braking distance • overall tyre A is the safest • tyre C is safest on a dry road • tyre B is the least safe tyre • the manufacturer should not choose tyre B allow use of stopping distance for braking distance throughout		6.5.4.3.3

c)

05.6	the greater the force the shorter the braking distance (because) deceleration will be greater **or** (because) the work done to stop the car will be the same		1 1	AO2 6.5.4.3.4 6.5.4.2.2