

Multiple Choice Answers

Q8: C

Multiple Choice Answers

Q11: A

2(a)(i)	(normal) force per (unit cross-sectional) area
2(a)(ii)	(due to difference in depth there is a) difference in pressure between top and bottom (of ball)
	(due to pressure difference, upwards) force on bottom of ball is greater (than downwards force on top of ball, so resultant force is upwards)
2(b)(i)	arrow vertically downwards labelled 'weight'
	arrow vertically upwards labelled 'upthrust'
	arrow vertically upwards labelled '(viscous) drag'
2(b)(ii)	SI base units of D : kg m s^{-2}
	base units of η : $\text{kg m s}^{-2} / (\text{m} \times \text{m s}^{-1})$ $= \text{kg m}^{-1} \text{s}^{-1}$
2(c)(i)	$\text{upthrust} = 920 \times (4/3) \times \pi \times (4.2 \times 10^{-3})^3 \times 9.81 = 2.8 \times 10^{-3} \text{ (N)}$
2(c)(ii)	weight = drag + upthrust
	$(2.4 \times 10^{-3} \times 9.81) = (2.8 \times 10^{-3}) + (6\pi \times 4.7 \times 4.2 \times 10^{-3} \times v)$
	$v = 0.056 \text{ m s}^{-1}$

Multiple Choice Answers

Q20: B

Multiple Choice Answers

Q12: D

Multiple Choice Answers

Q8: B

Multiple Choice Answers

Q8: B

3(a)	$W = Fd$
	$P = Fd / t = Fv$ or $P = Fvt / t = Fv$
3(b)(i)	$(\Delta)E_{(p)} = mg(\Delta)h$
	increase of gravitational potential energy of car in 1.0 s $= 1500 \times 9.81 \times 30 \times \sin 6.0 = 46\,000 \text{ J}$
3(b)(ii)	(Power to overcome total resistive forces) $= 1600 \times 30$ $= 48\,000 \text{ W}$
	power $= 48\,000 + 46\,000$ $= 9.4 \times 10^4 \text{ W}$
3(c)(i)	Air resistance is the same, as the speed is the same
3(c)(ii)	Mass / weight has increased so (power will) increase