

MARKING SCHEME AND MODEL ANSWERS

Chapter 9: Mechanical Properties of Fluids

Maximum Marks: 40 | Suggested time: 60 minutes

Use after attempting the paper. Accept equivalent correct methods.

Suggested mark allocation:

1 mark: Correct fact, formula, unit or direction.

2 marks: Principle/formula (1); explanation, working or result (1).

3 marks: Relation (1); working/reasoning (1); final result and unit (1).

4 marks: Principle (1); setup/equation (1); working (1); result/interpretation (1).

Mark splits are a guide; award partial credit for valid steps.

Q1 - 1 mark

Normal force per unit area.

Q2 - 1 mark

Pa s.

Q3 - 1 mark

$A_1 v_1 = A_2 v_2$.

Q4 - 1 mark

$p + \rho v^2 + \rho gh = \text{constant}$.

Q5 - 1 mark

N/m.

Q6 - 1 mark

ρgh .

Q7 - 1 mark

$6\pi r v$.

Q8 - 1 mark

$2S/r$.

Q9 - 2 marks

30,000 Pa.

Q10 - 2 marks

Doubles.

Q11 - 2 marks

Lower.

Q12 - 2 marks

100 N.

Q13 - 2 marks

40 Pa.

Q14 - 2 marks

Bubble has two liquid-air surfaces; $\Delta p = 4S/r$.

Q15 - 3 marks

8 m/s.

Q16 - 3 marks

16,000 Pa.

Q17 - 3 marks

approx 1.88×10^{-4} N.

Q18 - 3 marks

Hydrostatic balance gives $p = p_0 + \rho gh$ due to weight of fluid above.

Q19 - 4 marks

4.5 m/s.

Q20 - 4 marks

$\Delta p = 4S/r = 60$ Pa.