

Year 3
Big Test Questions
Oral Part

1. HYDROMECHANICS

- a) division, definition
- b) What's difference between hydrodynamics and hydrostatics?
- c) Hydraulic principle, hydraulic jack- structure, physical idea

2. PRESSURE

- a) Definition, basic unit, derive units (convert), excess pressure, atmosphere
- b) What's normal pressure, Pascal's law
- c) Pascal's experiment with vases, structure of dam

3. PARADOX

- a) Hydrostatic paradox, Hydrodynamic paradox
- b) Archimedes law, flotation
- c) Upthrust

4. LIQUIDS

- a) Basic properties of ideal liquids, real liquids
- b) Viscosity & Lubricants
- c) Explain the principle of hydraulic brakes, hydraulic jack
- d) Changing the boiling point – pressure cooker

5. PRESSURE FROM THE AIR

- a) How can you drink water through a straw?
- b) Describe principle of vacuum cleaner
- c) compare manometer and barometer

6. FLUID FLOW

- a) Bernoulli's principle
- b) Laminar flow, Turbulent flow
- c) Streamline, stream tube, aerodynamic design

7. SOLIDS

- a) Characterize basic properties (shape, volume,...)
- b) Crystalline and Amorphous, hidden heat
- c) How can we change the solid state

8. LIQUIDS

- a) Characterize basic properties (shape, volume ...)
- b) Boiling and freezing point (salt problem, altitude)
- c) Calorimetric equation

9. GASES

- a) Characterize basic properties (shape, volume ...)
- b) Ideal gas, Real gas
- c) State equation

10. SURFACE TENSION

- a) What's surface tension?
- b) How can we change the tension?
- c) Experiments with surface tension + bubbles and drops

11. CAPILLARY ACTION

- a) Adhesion – picture, characterize the forces acting on the molecule
- b) Cohesion
- c) Anomaly of water

12. 3-PHASE GRAPH OF WATER

- a) Condensation, Evaporation. Sublimation, Desublimation, Melting, Freezing
- b) Temperature scale
- c) Basic unit of temperature, why

13. STRESS- STRAIN CURVE

- a) Definition, Graph – characteristic
- b) Young's modulus
- c) Hooke's law

14. STATE EQUATION

- a) Isothermal, Isobaric, Isochoric, Adiabatic action
- b) Boltzman's constant
- c) Avogadro's hypothesis

15. GRAVITY

- a) Compare gravitational field and electrostatic field?
- b) Strength and potential formula
- c) What's permittivity