

CHAPTER 01

1. What is a fluid?

- A. Substance that will deform when only a massive shearing stress is applied
- B. Substance that deforms under any shearing stress**
- C. Substance that cannot be compressed

2. What is meant by defining a fluid as a “continuum”?

- A. Fluid parameters vary continuously throughout the fluid**
- B. There exist certain discontinuities throughout the fluid
- C. The fluid is forced to continually flow

3. Examples of primary quantities are which of the following?

- A. Size, Density, and Texture
- B. Length, Mass, and Chemical Structure
- C. Length, Time, Mass, and Temperature**

4. Which of the following selections are all British Gravitational System units?

- A. foot, pound, Newton, gallon
- B. foot, second, pound, Rankin, and slug**
- C. foot, liter, Kelvin, Celsius, and pound

5. Which following prefix is used when the unit is multiplied by 10^{-9} ?

- A. nano**
- B. micro
- C. pico

6. The broad subject of fluid mechanics can be generally divided into ____.

- A. fluid statics and fluid dynamics**
- B. fluid motion and fluid stability
- C. fluid composition and fluid dynamics

7. Specific volume is the reciprocal of what measurement?

- A. volume
- B. gravity
- C. density**

8. What is the definition of specific gravity?

- A. the weight per unit gravity
- B. the ratio of the density of water to the density of a fluid
- C. the ratio of the density of a fluid to the density of water**

9. How can the absolute pressure be found by using the gage pressure?

- A. by adding the gage pressure and the atmospheric pressure**
- B. by using the equation $P = \rho RT$
- C. by subtracting the atmospheric pressure from the gage pressure

10. The gas constant, R , depends on what?

- A. a relationship between the density and the pressure of the gas
- B. the molecular weight of sea-level air
- C. the molecular weight of the gas**

11. What is the no-slip condition that all fluids satisfy?

- A. the experimental observation that the fluid “slips” by the solid boundaries
- B. the experimental observation that the fluid “sticks” to the solid boundaries**
- C. the experimental observation that the fluid doesn’t “stick” to the solid boundaries

12. Shearing stress can be increased by ____.

- A. increasing the surface area
- B. increasing pressure**
- C. decreasing pressure

13. Fluids for which the shearing stress is not linearly related to the rate of shearing strain are designated as what?

- A. viscous fluids
- B. Newtonian fluid
- C. non-Newtonian fluid**

14. Examples of shear thickening fluids are ____.

- A. water-corn starch mixture and water-sand mixture**
- B. water-baking soda mixture and water-sand mixture
- C. salt-water and quicksand

15. Which is an example of a Bingham plastic?

A. blood

B. mayonnaise

C. salad dressing

16. Kinematic viscosity is defined as the ratio of the absolute viscosity to the fluid mass.

A. True

B. False

17. The effect of pressure on viscosity is usually neglected.

A. True

B. False

18. Which of the following describes the process that occurs under constant temperature conditions?

A. isentropic process

B. isothermal process

C.

D. incompressible process

19. Another term for the speed of sound is what?

A. absolute velocity

B. acoustic speed

C. acoustic velocity

20. The development of vapor pressure closely relates to ____.

A. molecular activity

B. the boiling point

C. atmospheric pressure

21. What was the name of the NASA spacecraft lost due to inconsistencies in units?

A. Mars Exploration Rovers (火星探測漫遊者 Mars Exploration Rover MER 是美國國家航空航天局的 2003 年火星探測計畫)

B. Stardust (星塵號：一個美國發射的行星間宇宙飛船、蘭卡斯特王室 1947 年 8 月 2 日在智利墜毀的飛機)

C. Mars Climate Orbiter (火星氣候探測者號 (Mars Climate Orbiter) 是美國太空總署的火星探測衛星，也是火星探測 98 計畫的一部份，於 1999 年發射。火星極地著陸者號為另一個探測火星的任務。不過火星氣候探測者號後來在進入火星軌道的過程中失去聯絡，任務失敗)

22. What is meant by a dimensionally homogeneous equation?

YOUR ANSWER: dimensions on the left side of the equation must match the dimensions on the right.

23. There are strong similarities between the general approach to fluid mechanics and what?

A. rigid-body motion

B. rigid-body and deformable-body solid mechanics

C. statics and dynamics

24. The Pressure in a fluid at rest is defined as the _____ force per unit area exerted on a plane surface immersed in a fluid

YOUR ANSWER: normal

25. Since large pressures are required to effect a change in volume, we conclude that liquids can be considered as ____ for most practical engineering applications.

YOUR ANSWER: incompressible

26. Boiling, which is the formation of vapor bubbles within the fluid mass, is initiated when the ____ in the fluid reaches the vapor pressure.

YOUR ANSWER: absolute pressure

27. The dimensions of surface tension are:

A. L/T

B. F/L

C. L/F

28. Water striders are capable of covering 100 body lengths in one second. True or False

A. True

B. False

29. The rise (or fall) of a liquid in a capillary tube is a common phenomena associated with what?

A. difference in pressure

B. surface area

C. surface tension

30. Which of the following is a good example of a non-wetting liquid when it is in contact with a glass tube?

A. beryllium

B. mercury

C. saltwater

31. Elaborate water supply systems were built by whom during the period from the fourth century B.C. through the early Christian period?

A. Romans

B. Greeks

C. British

32. The great Leonardo da Vinci described through sketches and writings many different types of flow phenomena, true or false?

A. True

B. False

33. The German professor Ludwig Prandtl introduced the concept of what?

A. fluid mechanics

B. aerodynamics

C. fluid boundary layer