

#### Max. Marks: 200

Date: 16.10.2022

# ABHIMANYU BATCH PHYSICS : PART TEST SET - A Topic: Fluids

- 1. The pressure at depth h below the surface of a liquid of density  $\rho$  open to the atmosphere is
  - (a) greater than the atmospheric pressure by  $\rho$  gh
  - (b) less than the atmospheric pressure by  $\rho gh$
  - (c) equal to the atmospheric pressure
  - (d) increases exponentially with depth
- 2. The force acting on a window of area 50 cm  $\times$  50 cm of a submarine at a depth of 2000 m in an ocean, the interior of which is maintained at sea level atmospheric pressure is (Density of sea water = 10 ms<sup>-2</sup>)
  - (a)  $5 \times 10^5$  N (b)  $25 \times 10^5$  N (c)  $5 \times 10^6$  N (d)  $25 \times 10^6$  N
- 3. A tank with a square base of area 2 m<sup>2</sup> is divided into two compartments by a vertical partition in the middle. There is a small hinged door of face area 20 cm<sup>2</sup> at the bottom of the partition. Water is filled in one compartment and an acid of relative density  $1.53 \times 10$  kg m<sup>-3</sup> in the other, both to a height of 4 m. The force necessary to keep the door closed is (Take g = 10 ms<sup>-2</sup>)
  - (a) 10 N (b) 20 N (c) 40 N (d) 80 N
- 4. Some iron beads are embedded in wax ball which is just floating in water. The volume of ball is 18 cm<sup>3</sup> and relative density of wax is 0.9. Then mass of the iron trapped in the ball is
  - (a) 1.8 g (b) 2.7 g (c) 16.8 g (d) 8.1 g
- 5. Hydraulic brakes are based on
  - (a) Pascal's law (b) Torricelli's law (c) Newton's law (d) Boyle's law



- 6. A piece of solid weighs 120 g in air, 80 g in water and 60 kg in a liquid. The relative density of the solid and that of the liquid are respectively
  - (a)  $2, \frac{1}{2}$  (b)  $2, \frac{3}{2}$  (c)  $3, \frac{1}{2}$  (d)  $3, \frac{3}{2}$
- 7. A block of wood floats in water with  $\left(\frac{4}{5}\right)^{\text{th}}$  of its volume submerged. If the same block just floats in a liquid, the density of the liquid (in kg m<sup>-3</sup>) is (a) 1250 (b) 600 (c) 400 (d) 800
- 8. Iceberg floats in sea water with a part of it submerged. The percentage fraction of the ice berg submerged is (Density of ice =  $0.9 \text{ g cm}^{-3}$ , density of sea water =  $1.1 \text{ g cm}^{-3}$ )
  - (a) 18% (b) 12% (c) 10% (d) 8%
- 9. A body of mass 100 kg and density 500 kg m<sup>-3</sup> floats in water. The additional mass should be added to the body so that the body will sink is
  - (a) 80 kg (b) 100 kg (c) 150 kg (d) 200 kg
- 10. A man is sitting in a boat which is floating in a pond. If the man drinks some water from the pond, the level of water in the pond
  - (a) increases
  - (b) decreases
  - (c) remains unchanged
  - (d) increases or decreases depends upon the weight of man



11. An ice block having two similar metallic pieces is floating in water in a vessel as shown in figure. After sometime the ice melts completely then



- (a) the water level rises in the vessel
- (b) the water level falls in the vessel
- (c) the water level does not change in vessel
- (d) the water level may rise or fall depending upon the ratio of masses of ice and metallic pieces.
- 12. An adulterated sample of milk has a density 1032 kg m<sup>-3</sup>, while pure milk has a density of 1080 kg m<sup>-3</sup>. Then the volume of pure milk in a sample of 10 litres of adulterated milk is
  - (a) 1 litre (b) 2 litre (c) 3 litre (d) 4 litre
- 13. A body is just floating on the surface of liquid. The density of the body is same as that of the liquid. The body is slightly pushed down. Then it will
  - (a) come back slowly to its earlier position (b) remain submerged where it is left.
  - (c) sink in liquid (d) come out vigoursly
- 14. Streamline flow is more likely for liquids with
  - (a) high density and high viscosity (b) low density and low viscosity
  - (c) high density and low viscosity (d) low density and high viscosity
- 15. When the flow parameters of any given instant remain same at every point, then flow is said to be
  - (a) laminar (b) steady state (c) turbulent (d) quasi static



16. An ideal flow of any fluid must satisfy

- (a) Pascal law
- (c) continuity equation (d) Bernoulli's theorem
- 17. Water is flowing continuously from a tap having an internal diameter  $8 \times 10^{-3}$  m. The water velocity as it leaves the tap is 0.4 m s<sup>-1</sup>. The diameter of the water stream at a distance  $2 \times 10^{-1}$  m below the tap is close to

(b)

Stokes law

(a)  $5.0 \times 10^{-3}$  m (b)  $7.5 \times 10^{-3}$  m (c)  $9.6 \times 10^{-3}$  m (d)  $3.6 \times 10^{-3}$  m

18. In the figure shown an ideal liquid is flowing through the tube which is of uniform area of cross-section. The liquid has velocities  $V_A$  and  $V_B$ , and pressures  $P_A$  and  $P_B$  at points A and B respectively. Then





23.

- 22. In old age arteries carrying blood in the human body become narrow resulting in an increase in the blood pressure. This follows from
  - (a) Pascals law
    (b) Stokes law
    (c) Bernoulli's principle
    (d) Archimedes principle
    Applications of Bernoulli s theorem can be seen in
  - (a) dynamic lift of aeroplane (b) hydraulic press
    - (c) helicopter (d) none of these
- 24. A liquid flows through a horizontal tube as shown in figure. The velocities of the liquid in the two sections which have areas of cross-section  $A_1$  and  $A_2$ , are  $v_1$  and  $v_2$ , respectively. The difference in the levels' the liquid in the two vertical tubes is h. Then



- (a)  $v_2^2 v_1^2 = 2gh$  (b)  $v_2^2 + v_1^2 = 2gh$  (c)  $v_2^2 v_1^2 = gh$  (d)  $v_2^2 + v_1^2 = gh$
- 25. Which of the following figure shown below is correct regarding the steady flow of a non viscous liquid?





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### ABHIMANYU BATCH CHEMISTRY : PART TEST SET-A Topic: Full Organic

26. Which one of the following will be most reactive for reaction?

(a) 
$$\bigvee CI \\ CH \longrightarrow CH \longrightarrow (b)$$

(c) 
$$CH_3 - C - CH_3$$
  
 $| CH_3$ 



 $\begin{array}{c} Cl \\ \downarrow \\ C_6H_5 - CH - C_6H_5 \end{array}$ 

27. Two monomers in maltose are :

- (a)  $\alpha$  -D-glucose and  $\beta$  -D-glucose (b)  $\alpha$  -D-glucose and  $\alpha$  -D-Fructose
- (c)  $\alpha$  -D-glucose and  $\alpha$  -D-glucose
- 28. The following compound can be classified as N, N-dimethylpropanamine, N-methyl Ethanamine and aniline

(d)

- (a) Primary, secondary, tertiary
- (c) Tertiary, secondary, primary
- 29. Petrol for aviation purpose must contain
  - (a) straight chain hydrocarbons
  - (c) olefinic hydrocarbons
- 30. Which of the following is correct statement
  - (a) Proteins are amino acid
    - (c) Starch is polymer of  $\alpha$  -glucose

(b) Primary, tertiary, secondary

 $\alpha$  -D-glucose and  $\alpha$  -D-galactose

- (d) Tertiary, primary, secondary
- (b) aromatic hydrocarbons
- (d) highly branched chain paraffins
- (b)  $\alpha$  -hydrogen is present in fructose
- (d) Amylose is compound of cellulose



- 31. The non-protein portion of an enzyme is called
  - (a) Functional group
  - (c) Prosthetic group
- 32. The product formed in the reaction of cumene with O<sub>2</sub> followed by treatment with dil.HCl are

(b)

(d)





S<sub>N</sub>2 mechanism only

(d)

Rickets

Beriberi

Characteristic group

Enolic group

- 33. Isopropyl chloride undergoes hydrolysis by
  - (a) Either  $S_N 1$  or  $S_N 2$  mechanism (b) Neither  $S_N 1$  nor  $S_N 2$  mechanisms
  - (c)  $S_N 1$  mechanism only
- 34. Deficiency of vitamin A leads to a disease known as
  - (a) Scurvy (b) Night blindness
- 35. In the given structure number of oxygen atoms in A is

(d)

(c)



Learning with the Speed of Mumbai and the Tradition of Kota

| 36. | Which of the following is not an electrophile?   |  |           |                            |     |                      |     |                                    |  |  |
|-----|--|--|-----------|----------------------------|-----|----------------------|-----|------------------------------------|--|--|
|     | (a)  | BF <sub>3</sub>  | (b)       | $\mathrm{CO}_2$            | (c) | $\mathrm{NH}_4^+$    | (d) | $CH_3^+$                           |  |  |
| 37. | Glucos   | se contains  |           |                            |     |                      |     |                                    |  |  |
|     | (a)  | One – CHO group  | )         |                            | (b) | Five – OH groups     |     |                                    |  |  |
|     | (c)  | One primary alcoh  | nolic gro | oup                        | (d) | All are correct      |     |                                    |  |  |
| 38. | Which  | of the following give  | ves Aldo  | ol condensation reaction   | on? |                      |     |                                    |  |  |
|     | (a)  | (CH <sub>3</sub> ) <sub>3</sub> CCHO                               |           |                            | (b) | CCl <sub>3</sub> CHO |     |                                    |  |  |
|     | (c)  |  | НО        |                            | (d) | СНО                  |     |                                    |  |  |
| 39. | The ha   | The harmone that helps in the conversion of glucose to glycogen is |           |                            |     |                      |     |                                    |  |  |
|     | (a)  | Adrenaline   | (b)       | Insulin                    | (c) | Cortisone            | (d) | Bile acids                         |  |  |
| 40. | In alde  | dehydes and ketones, carbon of carbonyl group is                   |           |                            |     |                      |     |                                    |  |  |
|     | (a)  | sp <sup>3</sup> hybridized   | (b)       | sp <sup>2</sup> hybridized | (c) | sp hybridized        | (d) | Unhybridised                       |  |  |
| 41. | The decomposition of a certain mass of CaCO <sub>3</sub> gave 11.2 of gas at STP. The mass of KOH required to complete neutralise the gas is |  |           |                            |     |                      |     |                                    |  |  |
|     | (a)  | 56 g   | (b)       | 28 g                       | (c) | 42 g                 | (d) | 20 g                               |  |  |
| 42. | Which one of the following methods is not related to amines?   |  |           |                            |     |                      |     |                                    |  |  |
|     | (a)  | Curtius reaction   | (b)       | Wurtz reaction             | (c) | Hofmann method       | (d) | Hinsberg method                    |  |  |
| 43. | The we   | eakest +m group o t  | he given  | species is:                |     |                      |     |                                    |  |  |
|     | (a)  | $-\operatorname{OCH}_3$  | (b)       | –F                         | (c) | _I                   | (d) | - N(CH <sub>3</sub> ) <sub>2</sub> |  |  |
|     |  |  |           |                            |     |                      |     |                                    |  |  |



Learning with the Speed of Mumbai and the Tradition of Kota

| 44. | What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromophenol                |  |                    |   |          |                    |          |                     |  |  |
|-----|---|--|--------------------|---|----------|--------------------|----------|---------------------|--|--|
|     | (a)   | 4.00                                     | (b)                | 10.22   | (c)      | 6.00               | (d)      | 20.44               |  |  |
| 45. | The IU  | JPAC name of the f                       | ollowing           | g compound is                                   |          |                    |          |                     |  |  |
|     |   | CH <sub>3</sub> O                        |                    |   |          |                    |          |                     |  |  |
|     | CH <sub>3</sub> -   | $-CH - CH_2 - CH_2 - CH_2$               | CH <sub>2</sub> OH | I   |          |                    |          |                     |  |  |
|     | (a)   | 1-Hydroxy-4-met                          | hyl-3-pe           | entanone  | (b)      | 2-Methyl-5-hydrox  | y-3-pent | anone               |  |  |
|     | (c)   | 4-Methyl-3-oxo-1-pentanol                |                    |   |          | Hexanol-1-one-3    |          |                     |  |  |
| 46. | Amino   | mino acids are produced on hydrolysis of |                    |   |          |                    |          |                     |  |  |
|     | (a)   | Nucleic acid                             | (b)                | Carbohydrates                                   | (c)      | Fats               | (d)      | Proteins            |  |  |
| 47. | Which   | is an electrophile                       |                    |   |          |                    |          |                     |  |  |
|     | (a)   | AlCl <sub>3</sub>                        | (b)                | $\mathrm{CN}^{-}$                               | (c)      | NH <sub>3</sub>    | (d)      | CH <sub>3</sub> OH  |  |  |
| 48. | Geom  | metrical isomerism is possible in:       |                    |   |          |                    |          |                     |  |  |
|     | (a)   | Butene-2                                 | (b)                | Ethene  | (c)      | Propane            | (d)      | Propene             |  |  |
| 49. | The re  | agent used for separ                     | ration of          | acetaldehyde and ace                            | etopheno | one is             |          |                     |  |  |
|     | (a)   | NaHSO <sub>3</sub>                       | (b)                | C <sub>6</sub> H <sub>5</sub> NHNH <sub>2</sub> | (c)      | NH <sub>2</sub> OH | (d)      | NaOH–I <sub>2</sub> |  |  |
| 50. | In order to make alcohol undrinkable pyridine and methanol are added to it. The resulting alcohol is called |  |                    |   |          |                    |          |                     |  |  |
|     | (a)   | Power alcohol                            | (b)                | Proof spirit                                    | (c)      | Denatured spirit   | (d)      | Poison alcohol      |  |  |



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| 1.  | (a) | 2.  | (c) | 3.  | (c) | 4.  | (a) | 5.  | (a) |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 6.  | (d) | 7.  | (d) | 8.  | (a) | 9.  | (b) | 10. | (c) |
| 11. | (b) | 12. | (d) | 13. | (c) | 14. | (d) | 15. | (b) |
| 16. | (c) | 17. | (d) | 18. | (b) | 19. | (a) | 20. | (b) |
| 21. | (c) | 22. | (c) | 23. | (a) | 24. | (a) | 25. | (a) |

# ABHIMANYU BATCH CHEMISTRY : PART TEST SET-A ANSWER KEY Topic: Full Organic

| 26. | (d) | 27. | (c) | 28. | (c) | 29. | (d) | 30. | (c) |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 31. | (c) | 32. | (c) | 33. | (a) | 34. | (b) | 35. | (b) |
| 36. | (c) | 37. | (d) | 38. | (c) | 39. | (b) | 40. | (b) |
| 41. | (a) | 42. | (b) | 43. | (c) | 44. | (b) | 45. | (a) |
| 46. | (d) | 47. | (a) | 48. | (a) | 49. | (a) | 50. | (c) |