



**Max. Marks: 60**

**Date: 15.10.2022**

**ABHIMANYU BATCH (SET B)**

**PHYSICS : DCT**

**Topic: Fluids**

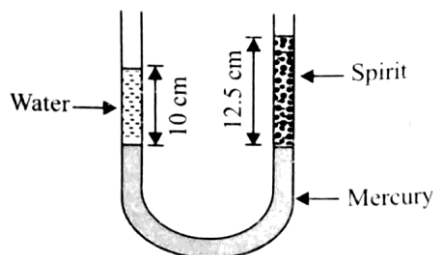
1. A 50 kg girl wearing heel shoes balances on a single heel. The heel is circular with a diameter 1 cm. The pressure exerted by the heel on the horizontal floor is (Take  $g = 10 \text{ ms}^{-2}$ )  
 (a)  $6.4 \times 10^4 \text{ Pa}$       (b)  $6.4 \times 10^5 \text{ Pa}$       (c)  $6.4 \times 10^6 \text{ Pa}$       (d)  $6.4 \times 10^7 \text{ Pa}$
2. Two syringes of different cross section (without needle) filled with water are connected with a tightly fitted rubber tube filled with water. Diameters of the smaller piston and larger piston are 1 cm and 3 cm respectively. If a force of 10 N is applied to the smaller piston then the force exerted on the larger piston is  
 (a) 30 N      (b) 60 N      (c) 90 N      (d) 100 N
3. In question number 2, if the smaller piston is pushed in through 6 cm, how much does the larger piston move out?  
 (a)  $\frac{2}{3} \text{ cm}$       (b)  $\frac{3}{2} \text{ cm}$       (c)  $\frac{1}{3} \text{ cm}$       (d)  $\frac{1}{2} \text{ cm}$
4. To what height should a cylindrical vessel be filled with a homogeneous liquid to make the force with which the liquid pressure on the sides of the vessel equal to the force exerted by the liquid on the bottom of the vessel?  
 (a) Equal to the radius      (b) Less than radius  
 (c) More than radius      (d) Four times of radius

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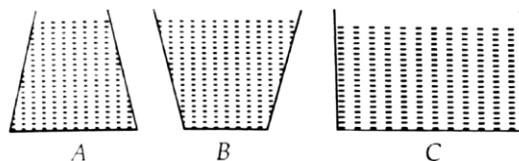
**Space for Rough Work**



5. A U tube contains water and methylated spirit separated by mercury. The mercury columns in the two arms are at the same level with 10 cm of water in one arm and 12.5 cm of spirit in the other as shown in figure. The relative density of the spirit is



- (a) 0.6                      (b) 0.8                      (c) 1.0                      (d) 1.25
6. In question number 10, if 15 cm of water and spirit each are further poured into the respective arms of the tube, difference in the level of mercury in the two arms is (Take, relative density of mercury = 13.6)
- (a) 0.20 cm              (b) 0.22 cm              (c) 0.27 cm              (d) 0.26 cm
7. In a wind tunnel experiment the pressures on the upper and lower surfaces of the wings are  $0.90 \times 10^5$  Pa and  $0.91 \times 10^5$  Pa respectively. If the area of the wing is  $40 \text{ m}^2$  the net lifting force on the wing is
- (a)  $2 \times 10^4$  N              (b)  $4 \times 10^4$  N              (c)  $6 \times 10^4$  N              (d)  $8 \times 10^4$  N
8. Three vessels A, B and C of different shapes contain a water upto the same height as shown in the figure.  $P_A$ ,  $P_B$  and  $P_C$  be the pressures exerted by the water at the bottom of the vessels A, B and C respectively. Then



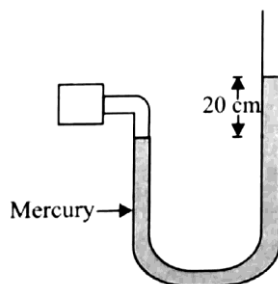
- (a)  $P_A > P_B > P_C$               (b)  $P_B > P_C > P_A$               (c)  $P_C > P_B > P_A$               (d)  $P_A = P_B = P_C$
9. Which of the following instrument is used for measuring gauge pressure?
- (a) Thermometer              (b) Barometer              (c) Manometer              (d) Hydrometer

**Space for Rough Work**



10. A manometer reads the pressure of a gas in an enclosure as shown in the figure. The absolute and gauge pressure of the gas in cm of mercury is

(Take atmospheric pressure = 76 cm of mercury)



- (a) 76, 20                      (b) 20, 76                      (c) 96, 20                      (d) 20, 96
11. Pressure applied to an enclosed fluid is transmitted undiminished to every point of the fluid and the walls of containing vessel. This law was first formulated by
- (a) Reynolds                      (b) Bernoulli                      (c) Pascal                      (d) Torricelli
12. Which of the following conversions is correct?
- (a)  $1 \text{ atm} = 1.01 \times 10^4 \text{ Pa}$                       (b)  $1 \text{ mm of Hg} = 133 \text{ Pa}$   
(c)  $1 \text{ bar} = 10^7 \text{ Pa}$                       (d)  $1 \text{ torr} = 10^2 \text{ Pa}$
13. Pressure is a scalar quantity because
- (a) it is the ratio of force to area and both force and area are vectors.  
(b) it is the ratio of the magnitude of the force to area.  
(c) it is the ratio of the component of the force normal to the area.  
(d) it depends on the size of the area chosen.

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14. Pressure at a point inside a liquid does not depend on
- (a) the nature of the liquid.
  - (b) shape of the container.
  - (c) the depth of point below the surface of the liquid.
  - (d) acceleration due to gravity at that point
15. The two femurs each of cross-sectional area  $10 \text{ cm}^2$  support the upper part of a human body of mass  $40 \text{ kg}$ . The average pressure sustained by the femurs is (Take  $g = 10 \text{ ms}^{-2}$ )
- (a)  $2 \times 10^3 \text{ Nm}^{-2}$       (b)  $2 \times 10^4 \text{ Nm}^{-2}$       (c)  $2 \times 10^5 \text{ Nm}^{-2}$       (d)  $2 \times 10^6 \text{ Nm}^{-2}$

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**ABHIMANYU BATCH**  
**CHEMISTRY : DCT SET - B**  
**Topic: Full Organic**

16. The number of hybrid orbitals in a molecule of benzene is :  
(a) 24 (b) 6 (c) 12 (d) 18
17. Which of the following is used as hypnotic?  
(a) Acetaldehyde (b) Paraldehyde (c) Formaldehyde (d) Metaldehyde
18. Formation of benzene from acetylene is  
(a) Trimerisation (b) Tetramerisation (c) Dimerisation (d) Condensation
19. Which of the following is not a sugar?  
(a) Sucrose (b) Glucose (c) Fructose (d) Cellulose
20. Preparation of Bakelite proceeds via reactions.  
(a) Condensation and elimination (b) Electrophilic addition and dehydration  
(c) Electrophilic substitution and dehydration (d) Nucleophilic addition and dehydration
21. Insulin is a protein which plays the role of  
(a) An antibody (b) A hormone  
(c) An enzyme (d) A transport agent
22. Which among the following is the strongest o, p-directing group  
(a) OH (b) Cl (c) C<sub>6</sub>H<sub>5</sub> (d) Br
23. A gene is a segment of a molecule of  
(a) DNA (b) m-RNA (c) t-RNA (d) Protein

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**Space for Rough Work**



24. The number of geometrical isomers of  
 $\text{H}_3\text{C} - \text{CH} = \text{CH} - \text{CH} = \text{CH} - \text{CH} = \text{CH} - \text{CH}_3$   
 (a) 4 (b) 5 (c) 6 (d) 3
25. Number of structural isomers for  $\text{C}_6\text{H}_{14}$  is  
 (a) 3 (b) 4 (c) 5 (d) 6
26. Bond angle in ethene is  
 (a)  $120^\circ$  (b)  $180^\circ$  (c)  $109^\circ$  (d)  $111^\circ$
27. A nanopptide contains ..... peptide linkages  
 (a) 10 (b) 8 (c) 9 (d) 18
28. The number of geometrical isomers for the following compound is  
 $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH} - \text{CH} = \text{CH} - \text{CH} = \text{CH}_2$   
 (a) 4 (b) 8 (c) 6 (d) 2
29. Ethyl alcohol exhibits acidic character on reacting with  
 (a) Acetic acid (b) Sodium metal  
 (c) Hydrogen iodide (d) Acidic potassium dichromate
30. The mass average molecular mass & number average molecular mass of a polymer are respectively 40,000 and 30,000. The polydispersity index of polymer will be  
 (a)  $< 1$  (b)  $> 1$  (c) 1 (d) 0

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**ABHIMANYU BATCH (SET B)**  
**PHYSICS : DCT ANSWER KEY**  
**Topic: Fluids**

1.	(c)	2.	(c)	3.	(a)	4.	(a)	5.	(b)
6.	(b)	7.	(b)	8.	(d)	9.	(c)	10.	(c)
11.	(c)	12.	(c)	13.	(c)	14.	(b)	15.	(c)

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**ABHIMANYU BATCH**  
**CHEMISTRY : DCT SET – B ANSWER KEY**  
**Topic: Full Organic**

16.	(d)	17.	(b)	18.	(a)	19.	(d)	20.	(c)
21.	(b)	22.	(a)	23.	(a)	24.	(c)	25.	(c)
26.	(a)	27.	(b)	28.	(a)	29.	(b)	30.	(b)