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Delhi | Bhopal | Hyderabad | Jaipur | Pune
Web: www.madeeasy.in | E-mail: info@madeeasy.in | Ph: 011-45124612

# BUILDING MATERIALS

## CIVIL ENGINEERING

**Date of Test : 25/03/2026**

## ANSWER KEY ➤

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

## DETAILED EXPLANATIONS

**1. (a)**

| Velocity of pulse (km/sec) | Quality of concrete |
|---|---|
| > 4.5 | Excellent |
| 3.5 – 4.5 | Good |
| 3 – 3.5 | Moderate |
| < 3 | Doubtful |

**2. (c)**

**3. (d)**

Wane is a defect arises due to conversion, denoted by the presence of original round surface on the manufactured piece of timber.

**4. (a)**

**5. (d)**

**6. (c)**

**7. (a)**

**8. (d)**

**9. (d)**

**10. (d)**

**11. (c)**

To prepare 2.5 $m^3$ workable RCC mix,

Volume of dry concrete = 1.53 × 2.5 = 3.825 $m^3$

$$V_{cement} = \frac{1}{7} \times 3.825 = 0.546\,m^3$$

$$\text{Number of bags} = \frac{0.546}{0.347} = 15.74 \simeq 16$$

**12. (d)**

**13. (d)**

- High alumina cement is not a type of portland cement and its predominant compound is mainly CA (monocalcium aluminate) in place of calcium silicates of portland cement.
- Hydrophobic cements are suitable for large transportation periods and long storage durations while quick setting cement are most suitable for tremie concreting.

**14. (d)**

**15. (b)**

$$\text{water} = \left(\frac{P}{5} + 2.5\right)\% \text{ where } P = \text{Std. consistency}$$

$$= \left(\frac{30}{5} + 2.5\right)\% = 8.5\%$$

**16. (a)**

**17. (c)**

$$CaO + H_2O \rightarrow Ca(OH)_2$$

56 g 18g

1g $\frac{18}{56}g$

10kg $\frac{18}{56} \times 10\text{kg} = 3.2\text{kg}$

**18. (d)**

- In dry process, raw ingredients are pre-heated by exhaust gases at 800°C which reduces the cost of fuel used in kiln to attain the required temperature.
- In wet process, cost of excavating and grinding of raw materials is low while the fuel consumptions cost is high as there is no preheating done in wet process.

**19. (c)**

- Angularity number varies in the range between 0 to 11.
- LA abrasion test is used to find hardness of the aggregates.

**20. (d)**

- Weight of timber section is measurement standard moisture content of 12%.
- Tensile strength of timber is generally 2 to 4 times the compressive strength.
- Felling of trees is avoided when sap is in vigorous motion i.e. in autumns and springs.

In this areas, felling is preferred in summers while in plane areas, falling is preferred in winters.

**21. (c)**

**22. (d)**

- Curing must be done for at least one week and its desirable upto 3 weeks.
- Maximum permissible height of free fall for concrete is 1.5 m.

**23. (c)**

Weight batching is preferred more than the volume batching as correction due to bulking of sand is to be applied in volume batching.

**24. (c)**

Size of mould is kept greater in order to account for shrinkage during drying and burning process.

**25. (a)**

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