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BUILDING MATERIALS

CIVIL ENGINEERING

Date of Test : 30/09/2025

ANSWER KEY ➤

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

DETAILED EXPLANATIONS

1. (a)

2. (a)

3. (d)

4. (b)

Let quantity of find sand = x

$\therefore$ Quantity of coarse aggregate = $(1-x)$

Let total quantity of (F.A + C.A) = 1

$(F.M)_{F.A} \times (Qty)_{F.A} + (F.M)_{C.A} \times (Qty)_{C.A} = (Qty)_{(F.A+C.A)} \times (F.M)_{mixed}$

$\therefore \quad (x \times 2.8) + (1-x)(7.6) = 1 \times 6.4$

$\Rightarrow \quad x = 0.25$

$\therefore \quad x = 25\%$

$\therefore \quad [F.A : C.A] = [25\% : 75\%] = [1 : 3]$

$\therefore$ Proportion of f.A is $\frac{1}{3} \times 100 = 33\%$

5. (b)

If sand quantity is *"x"* in given quantity of mortar therefore if x quantity is increased then binding material will be insufficient to bind the given quantities, quantity of sand in mortar, thereby shrinkage will also reduced during setting.

6. (c)

7. (d)

8. (c)

C.F. > 0.95, represent high workable concrete although the C.F. Test conducted on dry concrete/low workable concretes.

9. (d)

Minimum compressive strength of first class brick is 10 N/mm^2.

10. (a)

11. (d)

12. (b)

13. (d)

14. (a)

15. (c)

Let weight of cement = W_c kg
Weight of sand = W_s kg
Weight of aggregate = W_a kg
Net volume of concrete = Total volume as concrete – Volume of air in concrete
= $0.25 - 0.25 \times 0.02 = 0.245\ m^3$
Net volume of concrete = Volume of water + Volume of solids

$$0.245 = \frac{\text{Weight of water}}{\text{Density of water}} + \frac{\text{Weight of solids}}{\text{Density of solids}}$$

$$\Rightarrow \quad 0.245 = \frac{0.5W_e}{1000} + \left[\frac{W_c}{3.15\times1000} + \frac{W_s}{2.65\times1000} + \frac{W_a}{2.7\times1000}\right]$$

$$\Rightarrow \quad 0.245 = \frac{0.5\times W_c}{1000} + \left[\frac{W_c}{3.15\times1000} + \frac{2W_c}{2.65\times1000} + \frac{3W_c}{2.7\times1000}\right]$$

$$\therefore \quad W_c = 91.30\ \text{kg}$$

16. (b)

17. (b)

18. (c)

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

$\therefore$ 56 g of CaO requires 18 g of water

$\therefore$ 10 g of CaO will require $\frac{18}{56}\times 10\ \text{kg} = 3.2\ \text{kg}$ of water

19. (c)

Pulse velocity decreases with increase in temperature and increases below freezing temperature.

20. (b)

21. (d)

22. (d)

As per Table 9, IS 456:2000, for M20 it is 250 kg.

23. (c)

24. (c)

Rough aggregate surface results in stronger bond.

Vermiculite is an artificial light weight aggregate which produces low strength and high-shrinkage concrete.

25. (a)

Quick lime also known as fat lime, rich lime, pure lime or white lime slakes vigrously on addition of water.

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