

# CLASS TEST

S.No. : 01 PT\_CE\_A+B\_060719

Building Material



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# CLASS TEST 2019-2020

## CIVIL ENGINEERING

Date of Test : 06/07/2019

### ANSWER KEY > Building Material

1. (a)	7. (c)	13. (d)	19. (d)	25. (b)
2. (b)	8. (d)	14. (d)	20. (c)	26. (a)
3. (a)	9. (b)	15. (d)	21. (d)	27. (d)
4. (c)	10. (d)	16. (c)	22. (b)	28. (a)
5. (b)	11. (b)	17. (b)	23. (c)	29. (d)
6. (b)	12. (a)	18. (c)	24. (d)	30. (b)

## Detailed Explanations

9. (b)

Due to more water absorption property of bricks, stone work is more water tight.

11. (b)

Let quantity of fine sand =  $x$

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

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

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

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

$$\Rightarrow x = 0.25$$

$$\therefore x = 25\%$$

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

$$\therefore \text{Proportion of f.A is } \frac{1}{3} \times 100 = 33.33\%$$

16. (c)

The need to prepare sulphate resisting cement is the proneness of OPC towards sulphur.

The main constituents of OPC that are valuable to sulphur are  $C_3A$  and  $C_4AF$ . The ideal way to prepare sulphate resisting cement will be by reducing the concentration of  $Al_2O_3$  in raw material which will eventually produce less  $C_3A$  and  $C_4AF$  but concentration of  $Al_2O_3$  cannot be reduced feasibly.

So, excess  $Fe_2O_3$  is added in raw material which results in the formation  $C_4AF$  at the expense of  $C_3A$  and  $C_4AF$  is less vulnerable to sulphate attack as compared to  $C_3A$ .

17. (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.

20. (c)

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

21. (d)

Minimum compressive strength of first class brick is  $10 \text{ N/mm}^2$ .

22. (b)

Bleeding is the mechanism/defect in concrete where denser particles get settled down and lighter particles/material of concrete floats on the surface of denser mass of concrete and therefore due to “Excess quantity of coarse aggregate” may cause segregation in concrete.

23. (c)

The rebound hammer test measures the elastic rebound of concrete. The rebound number is correlated with compressive strength of concrete. The variation of strength of a properly calibrated hammer may lie between  $\pm 15\%$  and  $\pm 20\%$ .

24. (d)

High alumina cement never used along with admixture because it itself impart rapid gain of strength with maximum heat of hydration and if any admixture is added, it will produce cracks in structure.

29. (d)

$E_c = 5000\sqrt{f_{ck}}$ , where  $f_{ck}$ : characteristics compressive strength

- Hardness increases, Brittleness of concrete increases.
- Compressive strength and shear strength are dependent to each other, if compressive strength increases shear strength also increases.

30. (b)

Here, Let "F.A" quantity is =  $x$  in a mix of C.A and F.A

Given, Quantity of C.A. = 1

$\therefore$  Total quantity of (C.A + F.A) =  $(1 + x)$

$\therefore (1 + x) \times 6.14 = x + 2.78 + 1 \times 7.82$

$x = 0.50 \approx 50\%$  fine aggregate quantity.

