CLASS TEST

S.No.: 02_CE_JP_21092024

RPSC
Rajasthan Public Service Commission
ASSISTANT ENGINEER EXAMINATION

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BUILDING MATERIALS

CIVIL ENGINEERING

Date of Test : 21/09/2024

ANSWER KEY ➤

1.	(b)	11.	(c)	21.	(d)	31.	(a)	41.	(b)
2.	(d)	12.	(a)	22.	(a)	32.	(b)	42.	(a)
3.	(c)	13.	(d)	23.	(d)	33.	(c)	43.	(c)
4.	(b)	14.	(b)	24.	(d)	34.	(c)	44.	(c)
5.	(d)	15.	(d)	25.	(c)	35.	(b)	45.	(a)
6.	(d)	16.	(d)	26.	(a)	36.	(c)	46.	(d)
7.	(b)	17.	(b)	27.	(d)	37.	(d)	47.	(b)
8.	(d)	18.	(b)	28.	(d)	38.	(c)	48.	(a)
9.	(d)	19.	(b)	29.	(d)	39.	(c)	49.	(b)
10.	(a)	20.	(a)	30.	(a)	40.	(a)	50.	(c)

Detailed Explanations

1. (b)

$$\text{water} = \left(\frac{P}{5}+2.5\right)\% \text{ where } P = \text{Std. consistency} = \left(\frac{30}{5}+2.5\right)\% = 8.5\%$$

2. (d)

The compound C_3A characteristically reacts fast with water and may lead to an immediate stiffening of paste, and this process is termed flash set.

It provides weak resistance against sulphate attack and its contribution to the development of strength of cement is less significant than that of silicates. In addition, the C_3A phase is responsible for highest heat of evolution.

7. (b)

Oxide	Percentage	Average
Lime, CaO	60-65	63
Silica, SiO_2	17-25	20
Alumina, Al_2O_3	3-8	6.3
Iron oxide, Fe_2O_3	0.5-6	3.6
Magnesia, MgO	0.5-4	2.4
Sulphur trioxide, SO_3	1-2	1.5
Alkalis, i.e., soda and or potas, $Na_2O + K_2O$	0.5-1.3	1.0

24. (d)

Shotcrete is mortar or very fine concrete deposited by jetting or impacting it with high velocity (pneumatically projected or sprayed) on to a prepared surface. Shotcrete is frequently more economical than conventional concrete because of less formwork requirements, requiring only a small portable plant for manufacture and placement.

28. (d)

Brard's test is performed to check the frost resistance of stone.

31. (a)

Cubical mould of area = 5000 mm^2 is used to find compressive strength of cement.

Side of mould = $\sqrt{5000} \simeq 70.7$ mm

Volume = 353500 mm^3 = 353.5 cm^3

32. (b)

It is present either free as sand or in combination as silicate of alumina. Presence of silica prevents shrinking, cracking or warping of green brick. In the presence of lime and oxide of iron, silica fuses at lower temperature and provides the brick its hardness and durability.

40. (a)

$$6.4 = \frac{x\times 2.8+(100-x)\times 8.8}{100}$$

$$x = 40\%$$

42. (a)

Lack of ventilation leads to dry root in timber.

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