



**POSTAL
BOOK PACKAGE
2025**

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**CIVIL
ENGINEERING**

Objective Practice Sets

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Cement

- Q.1** Regarding the composition of raw materials used for manufacturing ordinary Portland cement, match **List-I** with **List-II** and select the correct answer by using the codes given below the lists:

List-I	List-II
A. Calcium oxide (CaO)	1. 2%
B. Silica (SiO ₂)	2. 3%
C. Aluminium oxide (Al ₂ O ₃)	3. 5%
D. Ferrous oxide (Fe ₂ O ₃)	4. 65%
E. Magnesium oxide (MgO)	5. 25%

Codes:

	A	B	C	D	E
(a)	4	5	3	2	1
(b)	1	2	3	4	5
(c)	2	4	5	1	2
(d)	2	1	3	5	4

- Q.2** The constituent compounds of cement in decreasing order of rate of hydration are
- C₂S, C₃S and C₃A
 - C₃S, C₃A and C₂S
 - C₃A, C₃S, and C₂S
 - C₃A, C₂S and C₃S
- Q.3** The tricalcium aluminate compound present in cement
- provides weak resistance against sulphate attack.
 - is responsible for highest heat of evaluation.
 - is characteristically fast reacting with water.
 - all of the above.
- Q.4** Match **List-I** with **List-II** and select the correct answer by using the codes given below the list:

List-I	List-II
A. Argillaceous	1. Sand (silica SiO ₂)
B. Silicious	2. Lime (CaO)
C. Calcareous	3. Clay (alumina Al ₂ O ₃)

Codes:

	A	B	C
(a)	1	2	3
(b)	3	2	1
(c)	2	1	3
(d)	3	1	2

- Q.5** Gypsum consists of
- H₂S and CO₂
 - CaSO₄ and H₂O
 - Lime and H₂O
 - CO₂ and calcium
- Q.6** A sample of cement is said to be sound when it does not contain free
- lime
 - silica
 - iron oxide
 - alumina
- Q.7** Low heat cement contains lower percentage of which of the following?
- C₃A
 - C₃S
 - C₂S
 - None of these
- Q.8** An excess of free lime in portland cement
- results in an increase in strength.
 - increases the initial setting time.
 - causes unsoundness in the product.
 - improves the quality of the product.
- Q.9** Initial setting time is maximum for
- portland-pozzolana cement
 - portland-slag cement
 - low-heat portland-pozzolana cement
 - high strength portland cement
- Q.10** The cement used in construction of docks and harbours is
- blast-furnace slag cement.
 - water proof cement.
 - hydrophobic cement.
 - sulphate-resisting portland cement.

- Q.11** The field test for the quality of cement consists in putting a small quantity of cement in a bucket containing water. A good quality cement will
- immediately dissolve in the water.
 - float on the water surface.
 - sink to the bottom of the bucket.
 - produce steam.

- Q.12** Match **List-I** (Apparatus) with **List-II** (Purpose) and select the correct answer using the code given below the lists:

List-I

- Le-Chatelier's apparatus
- Vicat Needle
- Vee-Bee apparatus
- Briquettes test machine

List-II

- Workability of concrete.
- Soundness of cement.
- Tensile strength.
- Final setting time of cement.

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 3 | 2 | 4 |
| (b) | 2 | 4 | 1 | 3 |
| (c) | 1 | 4 | 2 | 3 |
| (d) | 2 | 3 | 1 | 4 |

- Q.13** Match **List-I** with **List-II** and select the correct answer by using the codes given below the lists:

List-I

- Water and cement
- Tricalcium silicate
- Di-calcium silicate
- Tri-calcium aluminate

List-II

- Fast in reaction
- Slow in reaction
- Slowest in reaction
- Hydrates

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 4 | 2 | 3 | 1 |
| (b) | 1 | 3 | 2 | 4 |
| (c) | 4 | 1 | 2 | 3 |
| (d) | 3 | 2 | 1 | 4 |

- Q.14** High alumina cement is produced by fusing together a mixture of
- limestone and bauxite.
 - limestone, bauxite and gypsum.
 - limestone, gypsum and clay.
 - limestone, gypsum, bauxite, clay and chalk.

- Q.15** Pick out the incorrect statement.

- For hydraulic structures, a cement with small percentage of C_3S and more C_2S is recommended.
- Setting and hardening of cement stop as soon as the concrete becomes dry.
- The product $C - S - H$ get is known as tobermorite gel.
- The stiffening of cement without strength development is caused because of C_4AF .

- Q.16** Which one of the following statement regarding the cement fineness is NOT correct?

- Fine cement is more liable to suffer from shrinkage cracking than a coarse cement.
- Fine cement will show faster rate of hardening than coarse cement.
- Fine cement shows faster rate of heat evolution and total quantity of heat evolved is much larger than coarse cement.
- Fine cement shows the same setting time as coarse cement.

- Q.17** If ' P ' is percentage of water required for standard consistency of cement, water to be added for determination of unsoundness due to lime is

- $0.65 P$
- $0.85 P$
- $0.78 P$
- $0.5 P$

- Q.18** Match **List-I** (Cement mortar for different work) with **List-II** (Proportion of cement and sand in mortar) and select the correct answer using the codes given below the lists:

List-I

- Cement mortar for normal brick work
- Cement mortar for plastering works
- Cement mortar for grouting the cavernous rocks
- Cement mortar for guniting

List-II

1. 1 : 4
2. 1 : 3
3. 1 : 6
4. 1 : 1.5

Codes:

	A	B	C	D
(a)	3	4	2	1
(b)	1	2	3	4
(c)	3	1	4	2
(d)	1	4	2	3

- Q.19** The percentage of gypsum added to the clinker during manufacturing process is
- (a) 0.2 (b) 0.25 to 0.35
(c) 2.5 to 3.5 (d) 5 to 10
- Q.20** In the air permeability test of cement, the specific surface (in mm^2/g) is of the order of
- (a) 1000-2000 (b) 2000-2500
(c) 2500-5000 (d) 225000-350000
- Q.21** For ordinary portland cement the maximum expansion by Le Chatelier's method should not exceed
- (a) 2 mm (b) 5 mm
(c) 7.5 mm (d) 10 mm
- Q.22** As per IS specifications, the maximum final setting time for ordinary Portland cement should be
- (a) 30 minutes (b) 1 hour
(c) 6 hour (d) 10 hours
- Q.23** The temperature range in a cement kiln is
- (a) 500° to 1000°C (b) 1000° to 1200°C
(c) 1300° to 1500°C (d) 1600° to 2000°C
- Q.24** Specific surface of portland cement should not be less than
- (a) $2500 \text{ cm}^2/\text{gm}$ (b) $2000 \text{ cm}^2/\text{gm}$
(c) $2250 \text{ cm}^2/\text{gm}$ (d) $2250 \text{ m}^2/\text{kg}$
- Q.25** Loss on ignition in portland cement shall not be more than
- (a) 4% (b) 5%
(c) 3% (d) 6%
- Q.26** Consider the following statements:
1. Fine grinding of cement results in early development of strength.
 2. Rate of hydration of cement is increased when

it is ground finer.

Which of the above statements are CORRECT?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) None of these

Q.27 Consider the following statements:

High early strength of cement is obtained as a result of

1. fine grinding
2. decreasing the lime content
3. burning at higher temperatures
4. increasing the quantity of gypsum

Which of these statements are correct?

- (a) 1 and 2 (b) 1 and 3
(c) 2, 3 and 4 (d) 1, 3 and 4

Q.28 Consider the following statements:

More than 6% magnesium oxide by weight in cement results in

1. high early strength and high heat generation.
2. less tendency towards volume change and formation of cracks

Which of these statements is/are correct?

- (a) 1 only (b) 2 only
(c) Neither 1 nor 2 (d) Both 1 and 2

Q.29 Consider the following statements:

1. Setting and hardening of cement takes place after the addition of water.
2. Water causes hydration and hydrolysis of the constituent compounds of cement which act as binders.

Which of these statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q.30 Match List-I (Type of cement) with List-II (Characteristics) and select the correct answer using the codes given below the lists:

List-I

- A. Ordinary portland cement
- B. Rapid hardening cement
- C. Low heat cement
- D. Sulphate resistant cement

List-II

1. The percentage of C_3S is maximum and is of the order of 50%
2. The percentages of C_2S and C_3S are the same and of the order of 40%

3. Reacts with silica during burning and causes particles to unite together and development of strength
4. Preserves the form of brick at high temperature and prevents shrinkage

Codes:

	A	B	C	D
(a)	2	4	1	3
(b)	3	1	4	2
(c)	2	1	4	3
(d)	3	4	1	2

Q.31 Consider the following statements:

1. Tests on cement paste to determine initial and final setting times are done at normal consistency condition.
2. Low heat cement has a high percentage of tricalcium aluminate.
3. High early strength portland cement contains a larger percentage of tricalcium silicate and a lower percentage of dicalcium silicate.

Which of these statements are correct?

- (a) 1 and 2 (b) 3 only
(c) 2 and 3 (d) 1, 2 and 3

Q.32 Consider the following statements:

High Alumina Cement (HAC)

1. has high early compressive strength and high heat of hydration than OPC-43 grade
2. is not suitable to be used in cold regions

Which of these statements is/are correct?

- (a) 1 alone (b) 2 alone
(c) Both 1 and 2 (d) Neither 1 nor 2

Q.33 The minimum compressive strength of grade 43 cement mortar cube at the age of 7 days in _____ N/mm².

Q.34 The proper size of mould for testing compressive strength of cement is _____ cm cube.

Q.35 The specific gravity of commonly available ordinary portland cement is _____.

Q.36 A cement bag contains 0.035 cubic meter of cement by volume. How many bags will one tonne of cement comprise _____.

Q.37 The creep strain of cement attains its terminal value by _____ years.

Directions : Each of the next items consists of two statements, one labelled as 'Statement (I)' and the other as 'Statement (II)'. Examine these two statements carefully and select the answers to these items using the codes given below:

Codes:

- (a) Both Statement (I) and Statement (II) are individually true; and Statement (II) is the correct explanation of Statement (I)
(b) Both Statement (I) and Statement (II) are individually true; but Statement (II) is NOT the correct explanation of Statement (I)
(c) Statement (I) is true; but Statement (II) is false
(d) Statement (I) is false; but Statement (II) is true

38. Statement (I): The higher percentage of tricalcium silicate in cement results in rapid hardening with an early gain in strength at a higher heat of hydration.

Statement (II): A higher percentage of dicalcium silicate in cement results in slow hardening and less heat of hydration and greater resistance to chemical attack.

Q.39 Statement (I): The greater the surface area of a given volume of cement the greater the hydration.

Statement (II): The reaction between the water and cement starts from the surface of the cement particles.

Q.40 Statement (I): Finer the cement, greater is the need for water for hydration and workability.

Statement (II): Bleeding of a mix occurs due to low water-cement ratio.

Q.41 Statement (I): Expansive cement is used in repair work for opened up joints.

Statement (II): Expansive cement expands while hardening.

Q.42 Statement (I): Fine cement is more liable to suffer from shrinkage cracking than a coarse cement.

Statement (II): Fine cement shows the same setting time as that shown by coarse cement.

Multiple Select Questions (MSQ)

Q.43 Which of the following pair(s) in respect of ordinary portland cement (OPC) is/are correctly matched?

- (a) Initial setting time — 30 minutes