

QUESTION BANK

1. According to the relevant IS code, the weight of the timber is to be reckoned at a moisture content of
- (a) zero (b) 4%
(c) 8% (d) 12%
2. Match List-I (name of stone) with List-II (Use of stone) and select the correct answer using the codes given below the lists :
- | | |
|--|--|
| <p style="text-align: center;">List-I</p> <p>A. Granite</p> <p>B. Marble</p> <p>C. Chalk</p> <p>D. Laterite</p> | <p style="text-align: center;">List-II</p> <p>1. Ornamental work</p> <p>2. Ballast</p> <p>3. Rough stone work</p> <p>4. Manufacture of cement</p> |
|--|--|
- Codes :**
- | | | | |
|----------|----------|----------|----------|
| A | B | C | D |
| (a) 3 | 1 | 2 | 4 |
| (b) 2 | 3 | 1 | 4 |
| (c) 2 | 1 | 4 | 3 |
| (d) 1 | 4 | 2 | 3 |
3. The strength of timber is maximum when load applied is
- (a) parallel to grain
(b) perpendicular to grain
(c) inclined at 45° to grain
(d) inclined at 60° to grain
4. A good brick should not absorb water by weight more than
- (a) 10% (b) 20%
(c) 25% (d) 30%
5. Match List-I with List-II and select the correct answer using the codes given below the lists :
- | | |
|--|---|
| <p style="text-align: center;">List-I</p> <p>A. Fineness of cement</p> <p>B. Setting time</p> <p>C. Soundness</p> <p>D. Workability</p> | <p style="text-align: center;">List-II</p> <p>1. Le-Chatelier apparatus</p> <p>2. Vicat's needle</p> <p>3. Air permeability apparatus</p> <p>4. Slump cone</p> |
|--|---|
- Codes :**
- | | | | |
|----------|----------|----------|----------|
| A | B | C | D |
| (a) 1 | 2 | 3 | 4 |
| (b) 3 | 1 | 4 | 2 |
| (c) 3 | 2 | 1 | 4 |
| (d) 1 | 4 | 3 | 2 |
6. If 'p' is the standard consistency of cement, the amount of water used in conducting the initial setting time test on cement is
- (a) 0.65p (b) 0.85p
(c) 0.6p (d) 0.8p
7. The mortar used for masonry construction are classified based on strength in IS:2250 and IS:1905 according to their designation L₁, L₂, H₁, H₂, M₁, M₂. The correct sequence of increasing order of their strength is
- (a) L₁, L₂, H₁, H₂, M₁, M₂
(b) L₂, L₁, M₂, M₁, H₂, H₁
(c) M₁, M₂, H₁, H₂, L₁, L₂
(d) L₂, L₁, M₁, M₂, H₁, H₂

8. Lime mortar is generally made with
 (a) quick lime (b) fat lime
 (c) hydraulic lime (d) white lime
9. The compressive strength of a standard good 1 : 3 portland cement-sand mortar after 3 days of curing should not be less than
 (a) 70 kg/cm² (b) 115 kg/cm²
 (c) 175 kg/cm² (d) 210 kg/cm²
10. The split tensile strength of M 15 grade concrete when expressed as percentage of its compressive strength is
 (a) 10 to 15% (b) 15 to 20%
 (c) 20 to 25% (d) 25 to 30%
11. The approximate ratio between the strengths of cement concrete at 7 days and at 28 days is
 (a) 3/4 (b) 2/3
 (c) 1/2 (d) 1/3
12. Modulus of elasticity of M 25 concrete as determined by formula of IS:456 is
 (a) 1,24,500 MPa (b) 90,125 MPa
 (c) 28,500 MPa (d) 16,667 MPa
13. Match List-I (Metals or alloys) with List-II (Their common use) and select the correct answer using the codes given below the lists:
- | List-I | List-II |
|-------------------|------------------------------|
| A. Steel bars | 1. Water taps |
| B. Zinc | 2. Door Frames |
| C. Aluminium | 3. Reinforcement in concrete |
| D. Brass castings | 4. Corrugated roof sheet |
- Codes :** A B C D
- (a) 3 1 4 2
 (b) 3 2 4 1
 (c) 1 3 4 2
 (d) 3 4 2 1
14. The modulus of elasticity of high tensile steel is
 (a) smaller than that of mild steel
 (b) equal to that of mild steel
 (c) larger than that of mild steel
 (d) equal to that of aluminium
15. Yield stress of ordinary mild steel bars after twisting to a pitch of about 9 to 12 diameters
 (a) increases by about 50%
 (b) decreases by about 30%
 (c) increases by about 20%
 (d) decreases by about 10%
16. **Assertion (A) :** Dimensional changes in wood result due to variation in the moisture content of the wood with atmospheric condition.
Reason (R) : The cell walls in wood are highly hygroscopic and when exposed to moisture, absorb large amounts of water and swell.
 (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true but R is not a correct explanation of A
 (c) A is true but R is false
 (d) A is false but R is true
17. **Assertion (A) :** Pozzolana is added to cement to increase early strength.
Reason (R) : It offers greater resistance to the attack of aggressive waters.
 (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true but R is not a correct explanation of A
 (c) A is true but R is false
 (d) A is false but R is true
18. **Assertion (A) :** Use of cement lime mortar is generally preferred to cement mortar.
Reason (R) : Cement-lime mortar has higher workability and water retentivity characteristics than cement mortar.
 (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true but R is not a correct explanation of A
 (c) A is true but R is false
 (d) A is false but R is true

19. **Assertion (A)** : For identical mix, the cube compressive strength of concrete obtained from 15 cm cube is higher than 15 cm × 30 cm cylinder compressive strength.
- Reason (R)** : Cube compressive strength is higher than the cylinder compressive strength because of its higher contact area under the load.
- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
20. For good bonding in bricks uniform in size
- (a) all bricks need not be uniform in size
(b) bats must be used in alternate course only
(c) the vertical joints in alternate course should fall in plumb
(d) cement mortar used must have surkhi as additive
21. The nail diameter should not be more than (t = least thickness of the wooden member to be connected)
- (a) t/6 (b) t/8
(c) t/10 (d) t/12
22. King closers are related to
- (a) door and windows (b) king post truss
(c) queen post truss (d) brick masonry
23. **Assertion (A)** : The specific surface of aggregate decreases with increase in size of the aggregate.
- Reason (R)** : The workability of a mix is influenced more by the finer fractions than the coarse particles.
- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
24. **Assertion (A)** : Workability of concrete is improved by air entraining agent.
- Reason (R)** : Air entraining agent increases concrete strength.
- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
25. The expansion and shrinkage of plywoods are comparatively very low as
- (a) they are held in position by adhesives
(b) they are glued under pressure
(c) plies are placed at right angles to each other
(d) they are prepared from veneers
26. Seasoning of timber is required to
- (a) soften the timber
(b) harden the timber
(c) straighten the timber
(d) remove sap from the timber
27. The coefficient of linear expansion of granite is in the range of that of
- (a) glass (b) mild steel
(c) high carbon steel (d) bamboo
28. The texture of sandstone is
- (a) porphyritic (b) conglomerate
(c) vesicular (d) granular crystalline
29. A good brick, when immersed in water bath for 24 hours, should not absorb more than
- (a) 20% of its dry weight
(b) 30% of its saturated weight
(c) 10% of its dry weight
(d) 20% of its saturated weight
30. For complete hydration of cement the water-cement ratio needed is
- (a) less than 0.25
(b) more than 0.25 but less than 0.35
(c) more than 0.35 but less than 0.45
(d) more than 0.45 but less than 0.60

31. 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. Air entraining portland cement
- B. Low-heat portland cement
- C. Hydrophobic portland cement
- D. Rapid hardening portland cement

List-II

- 1. Suitable for very large structures
- 2. Unsuitable for very large masses of concrete
- 3. Greater resistance to frost attack
- 4. Safe storage under unfavourable conditions of humidity

Codes : **A** **B** **C** **D**

- | | | | |
|-------|---|---|---|
| (a) 4 | 2 | 1 | 3 |
| (b) 3 | 4 | 1 | 2 |
| (c) 3 | 1 | 4 | 2 |
| (d) 4 | 1 | 2 | 3 |

32. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I

- | | |
|-----------------------|-----------------------------|
| A. Fat lime | 1. Calcined dolomitic stone |
| B. Hydraulic lime | 2. Calcined lime stone |
| C. Quick lime | 3. Kankar |
| D. Non-hydraulic lime | 4. Sea shells |

List-II

Codes : **A** **B** **C** **D**

- | | | | |
|-------|---|---|---|
| (a) 3 | 4 | 2 | 1 |
| (b) 4 | 3 | 2 | 1 |
| (c) 3 | 4 | 1 | 2 |
| (d) 4 | 3 | 1 | 2 |

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

List-I

- | | |
|---------------------------------|-----------|
| A. Normal brick work | 1. 1 : 4 |
| B. Plastering works | 2. 1 : 3 |
| C. Grouting the cavernous rocks | 3. 1 : 6 |
| D. Guniting | 4. 1 : 15 |

List-II

Codes : **A** **B** **C** **D**

- | | | | |
|-------|---|---|---|
| (a) 1 | 2 | 3 | 4 |
| (b) 3 | 1 | 2 | 4 |
| (c) 3 | 1 | 4 | 2 |
| (d) 4 | 3 | 2 | 1 |

34. Tensile strength of concrete is measured by

- (a) direct tension test in the universal testing machine
- (b) applying compressive load along the diameter of the cylinder
- (c) applying third point loading on a prism
- (d) applying tensile load along the diameter of the cylinder

35. The approximate ratio of strength of 15 cm × 30 cm concrete cylinder to that of 15 cm cube of the same concrete is

- | | |
|----------|----------|
| (a) 1.25 | (b) 1.00 |
| (c) 0.85 | (d) 0.50 |

36. If in a concrete mix the fineness modulus of coarse aggregate is 7.6, the fineness modulus of fine aggregate is 2.8 and the economical value of the fineness modulus of combined aggregate is 6.4, then the proportion of fine aggregate is

- | | |
|---------|-----------------------|
| (a) 25% | (b) $33\frac{1}{3}\%$ |
| (c) 50% | (d) $66\frac{2}{3}\%$ |

37. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I

- A. Vicat's needle
- B. Michaeli's compound
- C. Le Chatelier's apparatus
- D. Turbidimeter

List-II

- 1. Setting time
- 2. Specific surface lever apparatus
- 3. Tensile strength
- 4. Soundness

Codes : **A** **B** **C** **D**

- | | | | |
|-------|---|---|---|
| (a) 1 | 2 | 3 | 4 |
| (b) 1 | 3 | 4 | 2 |
| (c) 2 | 4 | 3 | 1 |
| (d) 3 | 4 | 1 | 2 |

38. Blast furnace slag has approximately
- 45% calcium oxide and about 35% silica
 - 50% alumina and 20% calcium oxide
 - 25% magnesia and 15% silica
 - 25% calcium sulphate and 15% alumina
39. The ratio of Young's modulus of high tensile steel to that mild steel is about
- 0.5
 - 1.0
 - 1.5
 - 2.0
40. Bureau of Indian Standards classifies bitumen into grades 65/25, 85/40 etc. The first and second numbers respectively refer to
- softening point and penetration
 - penetration and softening point
 - flash point and penetration
 - flash point and softening point
41. Polyvinyl chloride (PVC) is a
- thermosetting material
 - thermoplastic material
 - elasto-plastic material
 - rigid plastic material
42. General shrinkage in cement concrete is caused by
- carbonation
 - stressed due to external load
 - drying with starting with a stiff consistency
 - drying with starting with a wetter consistency
43. While concreting in cold weather where frosting is also likely, one uses
- high quality portland cement with minimum additives
 - high alumina cement with calcium chloride additives
 - portland cement together with calcium chloride additives
 - a mixture of high alumina cement and portland cement
44. Gypsum is used as an admixture in cement grouts for
- accelerating the setting time
 - retarding the setting time
 - increasing the plasticity
 - reducing the grout shrinkage
45. Weight-batching proceeds on
- the assumption of the declared weight in each bag of cement
 - weighing the contents of each bag
 - accurately estimating the weight of each material to be used in each batch
 - the assumption of correct dry weight of each size range of each material and the weight of water
46. **Assertion (A):** While painting on flush doors of plywood, putty-filling is done after prime coat.
Reason (R): This reduces the quantity of paint and effort involved in the regular coats of the paints.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not a correct explanation of A
 - A is true but R is false
 - A is false but R is true
47. **Assertion (A):** The task work expected from a good mason with his team is about 7.00 sq.m (approximately 0.8 cu.m) in half-brick partition walls, whereas it is about 1.25 cu.m in one brick or thicker walls in superstructure.
Reason (R): Quantity of cement mortar in half-brick work is less than proportionate when compared to one-brick wall.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not a correct explanation of A
 - A is true but R is false
 - A is false but R is true
48. Match List-I with List-II and select the correct answer using the codes given below the lists:
- | List-I | List-II |
|---------------|---------------|
| A. Deciduous | 1. Soft wood |
| B. Conifer | 2. Hard wood |
| C. Endogenous | 3. Eucalyptus |
| D. Exogenous | 4. Bamboo |

Codes :

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

49. The modulus of elasticity of timber is about

- (a) 0.5 to 1.0×10^4 N/mm²
- (b) 1.0 to 1.5×10^4 N/mm²
- (c) 1.5 to 2.0×10^4 N/mm²
- (d) 2.0 to 2.5×10^4 N/mm²

50. During the conversion of timber by sawing, in order to obtain strong timber pieces, the cuts should be made by

- (a) ordinary sawing
- (b) tangential sawing
- (c) quarter swaying
- (d) radial sawing

□□□

ENGINEERS ACADEMY

ANSWER AND EXPLANATIONS

1. **Ans. (d)**

Weight and strength properties of timber are greatly influenced by moisture content. Therefore the strength values and weight obtained are usually standardized at 12% moisture content.

2. **Ans. (c)**

Chalk is used as a colouring material in the manufacture of portland cement. Laterite is used as a road metal, in rough masonry work etc.

3. **Ans. (a)**

Timber is stronger in tension along the grain but it is quite difficult to determine this because of the difficulties in conducting the test.

4. **Ans. (b)**

The brick should not absorb water more than 20% by weight for first class bricks and 22% by weight for second class bricks, when soaked in cold water for 24 hours.

5. **Ans. (c)**

Blaine's Air permeability apparatus is used to test fineness of cement. Vicat's needle is used for determining the setting time of cement Soundness of cement is determined by Lechatelier apparatus and Slump cone is used to determine workability of concrete.

6. **Ans. (b)**

According to IS 4031 Part 5. The initial setting time test is conducted on cement by gauging the cement with 0.85 times the water required to give a paste of standard consistency.

7. **Ans. (b)**

According to IS 1905-1987 following are the strength of various grades of mortars

Grade	Strength (MPa)
H ₁	10
H ₂	7.5 – 6.0
M ₁	5.0 – 3.0
M ₂	3.0 – 2.0
L ₁	0.7
L ₂	0.5

8. **Ans. (c)**

Lime used for mortar may be fat lime (quick or hydrated lime) or hydraulic lime. Slaked fat lime is used to prepare mortar for plastering, while hydraulic lime is used in preparing mortar for masonry construction.

9. **Ans. (c)**

The strength of standard mortar cube after 3 days, shall not be less than

- 16 MPa (160 kg/cm²) for 33 grade OPC as per IS : 269-1989
- 23 MPa (230 kg/cm²) for 43 grade OPC as per IS: 8112-1989
- 27 MPa (270 kg/cm²) for 53 grade OPC as per IS: 12269-1987

10. **Ans. (b)**

Split tensile strength is 5% to 12% higher than direct tensile strength. The ratio of split tensile strength to compressive strength for different grades of concrete are given below:

M10	10%–15%
M15	15%–20%
M20	20%–25%
M30	25%–30%

For approximation purpose one can take split tensile strength as $0.7\sqrt{f_{ck}}$ which is the flexural strength given by IS: 456-2000. The ratio of split tensile strength to compressive strength is given by

$$\frac{0.7\sqrt{f_{ck}}}{f_{ck}} \times 100$$

For M 15 $f_{ck} = 15 \text{ N/mm}^2$

$$\Rightarrow \frac{0.7\sqrt{15}}{15} \times 100 = 18\%$$

So 15% – 20% should be the choice.

11. **Ans. (b)**

7 day strength of concrete shouldn't be less than 2/3 of 28 days strength of concrete.

12. **Ans. (c)**

The modulus of elasticity as per IS : 456 – 1978

$$E_c = 5700\sqrt{f_{ck}} \text{ N/mm}^2$$

The modulus of elasticity as per IS : 456 – 2000

$$E_c = 5000\sqrt{f_{ck}} \text{ N/mm}^2$$

For M 25

$$\begin{aligned} E_c &= 5700\sqrt{f_{ck}} = 28,500 \text{ MPa} \\ E_c &= 5000\sqrt{f_{ck}} = 25,000 \text{ MPa} \end{aligned}$$

13. **Ans. (d)**

Steel bars are used as reinforcement in R.C.C.

Zinc is used for making corrugated roof sheet.

Aluminium is used for making door frames.

Brass castings is used for water taps.

14. **Ans. (b)**

$E = 2 \times 10^5 \text{ N/mm}^2$ for both mild steel and high tensile bars.

15. **Ans. (c)**

The yield strength of mild steel plain rounded bar is 255 N/mm^2 . So the increase is about 20% from a value of 250 N/mm^2 .

16. **Ans. (a)**

Dimensional changes in wood occurs due to variation in the moisture content of the wood with atmospheric condition any drying of wood below the fibre saturation point result in shrinkage. If a dry piece of timber is kept in saturated atmosphere timber absorbs water from air up to about 15% of its weight. This water goes into the cell walls which tend to swell up.

17. **Ans. (d)**

Portland-pozzolana cement produces less heat of hydration and offers greater resistance to sulphate attack and chloride-ion penetration due to impurities in water than normal portland cement. All pozzolanas need not necessarily contribute to strength at early ages.

18. **Ans. (a)**

Cement lime mortar have the good qualities of cement as well as of lime. They possess medium strength along with good workability and good

water retentivity freedom from cracks and good resistance to rain penetration.

19. **Ans. (c)**

The restraining effect of the platens of the testing machine extends over the entire height of the cube but leaves unaffected a. part of test cylinder because of its greater height. It is therefore, the strength of cub made from identical concrete will be higher from strength of cylinder.

20. **Ans. (c)**

For good bonding in brick masonry

- Arrangement of bricks in brick work so that vertical joint don't come over each other vertical joints in alternate course should fall in plumb.
- Bats are generally avoided in construction.

21. **Ans. (a)**

In nailed joints in timber, it is found that where prebore is necessary, the diameter of the hole should not be greater than $\frac{4}{5}$ of the diameter of the nail and that the diameter of the nails must lie with in $\frac{1}{4}$ and $\frac{1}{6}$ least thickness of timbers to be connected.

22. **Ans. (d)**

King closers are the portions of a brick obtained by cutting off the triangular piece between the centre of one end and the centre of one side.

23. **Ans. (b)**

The specific surface of aggregate is inversely proportional to the particle size.

The greatest contribution to the total surface area is made by the smaller size aggregate and therefore particular attention should be paid to the proportion and grading of fine aggregate. Too coarse aggregate results in hardness, reaggregation and bleeding and too fine aggregate requires too large w/c ratio for adequate workability.

24. **Ans. (c)**

Air entrainment increases workability of fresh concrete. The tiny bubbles of cement act like fine aggregates and reduce the interaction between solid aggregates. Excessive air will lower strength and reduce freeze thaw resistance.

25. **Ans. (c)**

In plywood because of the cross-grained construction, the tendency to shrink and swell is considerably reduced.

26. **Ans. (d)**

A newly fallen tree contains water and sap both about 50% of its over dry weight. For using the timber for any engineering purpose, all the moisture and sap are removed out of its and for this seasoning of timber is done.

27. **Ans. (a)**

The linear thermal coefficient range is 6×10^{-6} to 10×10^{-6} for both glass and granite.

28. **Ans. (d)**

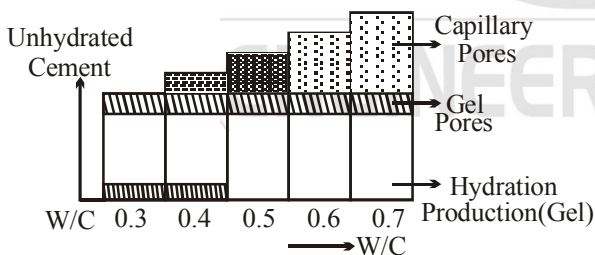
Sandstones are made of sand grains that have been cemented together. Sandstones usually have a rough, granular texture.

29. **Ans. (a)**

A/c to IS 1077 – 1992 Cl 7.2 water absorption shall not be more than 20% by weight for higher class.

30. **Ans. (c)**

On an average 25% of water by weight of cement is required for chemical reaction with Portland cement compounds. About 17% water by weight of cement is required to fill the gel-pores. Thus 42% water by weight is required for chemical, reaction and gel pores. If more than 42% of water is used, the excess will cause undesirable cavities.



31. **Ans. (c)**

Low heat portland cement can be used for mass concreting in very large structure while rapid hardening portland cement is unsuitable for it. Air entraining portland cement provides greater resistance to frost attack and hydrophobic portland cement can be stored safely under unfavourable conditions of humidity.

32. **Ans. (b)**

Sea shells are the source of fat lime.

Kankar is the source of hydraulic lime.

Quick lime is made for calcined limestone.

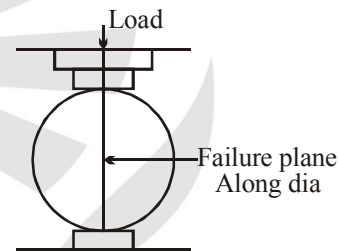
Calcined dolomitic stone is Non-Hydraulic lime.

33. **Ans. (c)**

The gunite is a mixture of 100 parts by weight of cement, 300 parts by weight of quartz sand, 35-50 parts by weight of water and 2 parts by weight approved quick compounds.

34. **Ans. (b)**

Tensile strength is generally determined indirectly. A compressive force is applied to a concrete specimen in such a way that specimen fails due to tensile stress induced in specimen. The compressive load is applied along opposite generators of concrete cylinder placed with its axis horizontal between the platens.



35. **Ans. (c)**

Ratio of cylinder strength to cube strength varies from 0.77 – 0.96. Thus 0.85 can be taken as approximate ratio.

36. **Ans. (b)**

The proportion of fine aggregate to combined aggregate,

$$R = \frac{p_2 - p}{p - p_1} \times 100$$

$$\therefore R = \frac{7.6 - 6.4}{6.4 - 2.8} \times 100 = 33\frac{1}{3}\%$$

37. **Ans. (b)**

Vicat's needle is used for determining the setting time of cement. Michaeli's compound lever apparatus is used for determine the tensile strength of concrete Le-chatelier's apparatus is used for checking the soundness of cement and Turbidimeter is used for measuring the specific surface.

38. Ans. (a)

Blastfurnace slag composition

CaO	: 42.4%
SiO ₂	: 32.3%
Al ₂ O ₃	: 13.3%
Fe ₂ O ₃	: 0.3%
MgO	: 6.4%
SO ₃	: 2.1%

39. Ans. (b)

Young's modulus of both high tensile steel and mild steel is equal hence its ratio is 1.0.

40. Ans. (a)

Industrial bitumens are specified as per 18:73-1961 as 65/25 meaning the penetration value is 20-30 and softening point is 55 -76°C. Thus first number is softening point and second is penetration value. Paving grade bitumens are specified as 60/ 70 means that penetration value is 60 to 70.

41. Ans. (b)

Thermoplastic or heat non-convertible group means that the plastics become soft when heated and hard when cooled. Thermosetting or heat convertible group means that plastics become rigid when moulded at suitable pressure and temperature.

Rigid plastics have a high modulus of elasticity and they retain their shape under external stresses application at normal or moderately increased temperatures.

42. Ans. (d)

The drying in concrete starting from a wetter consistency causes shrinkage of concrete.

43. Ans. (b)

Calcium chloride is a rapid hardening agent. The acceleration of setting, hardening and evolution of this large quantity of heat in the early period of hydration makes the cement suitable for concreting in cold weather. The increased porosity of high alumina cement further develops more resistance to frosting.

44. Ans. (b)

The retarder is an admixture that slow down the chemical process of hydration so that concrete remains plastic and workable for a longer time than concrete without the retarder. Gypsum is used in grouting to retard the setting time.

45. Ans. (d)

In weigh batching the correct dry weight of each size range of each material is calculated from their actual weight and then the weight of water is measured after making compensation for absorbed and surface water.

46. Ans. (b)

Putty-filling shall be done after priming. If the surface is not primed first, the filler on stopping may shrink and fall a way, because wood absorbs the oil in stopping and latter is, therefore liable to crack and work loose. The use of putty fills the opened cells of the wood in the surface layer and level up slight irregularities of the surface. This reduces the quantity of paint and effort involved in the regular coats of the paints.

47. Ans. (c)

Half brick work is done in stretcher course only while other brickworks are done in both header and stretcher courses.

48. Ans. (c)

Deciduous trees are hardwood trees and are broad leaved trees. Coniferous trees have needle shaped leaves and grow in temperature region and in high altitudes.

49. Ans. (a)

The species of timber recommended for construction purpose are classified into three groups on the basis of their modulus of elasticity.

Group A: with modulus of elasticity above 125 t/cm² (12500 N/mm²)

Group B: with modulus of elasticity between 98 t/cm² (9800 N/mm²) and 125 t/cm² (12500 N/mm²)

Group C: with modulus of elasticity above 56 t/cm² (5600 N/mm²) and below 98 t/cm² (9800 N/mm²)

50. Ans. (d)

The order of strength of timber section is Radial sawing > Quarter sawing > Ordinary sawing > Tangential sawing

□□□