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DEPARTMENT OF CIVIL ENGINEERING

SECOND YEAR (SY)

SCHEME: I **SEMESTER: III**

NAME OF SUBJECT: CONCRETE TECHNOLOGY

Subject Code: 22305

UNIT WISE MULTIPLE CHOICE QUESTIONS BANK

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Question Bank for Multiple Choice Questions

Program: Diploma in Civil engineering	**Program Code:- CE**
Scheme:-I	**Semester:- 3**
Course:- CONCRETE TECHNOLOGY	**Course Code:- 22305**

01 Cement	**Marks:-06**
Content of Chapter:- 1.1 Constituents of OPC and their properties lies of OPC 1.2 Different grades of OPC. 33, 43, and 53 with specifications 1.3 Testing of OPC: Field tests and laboratory tests-fineness test, standard consistency test 1.4 Physical properties, I.S. Specifications and field applications of different types of cements	

Q. 1. Why is natural cement used very limitedly?
a) Brown in Colour
b) Standard consistency is not met with
c) Sets too quickly
d) Particle size is too fine

Answer: c
Explanation: Natural cement sets very quickly after the addition of water and hence it is not quite workable. Artificial cement is preferred over this.

Q. 2. Who invented Portland cement and in which year?
a) William Aspdin, 1824
b) William Aspdin, 1840s
c) Joseph Aspdin, 1840s
d) Joseph Aspdin, 1824

Answer: b
Explanation: Joseph Aspdin patented Portland cement in 1824. William Aspdin, his son is regarded as the inventor of modern Portland cement due to his developments in 1840s.

Q. 3. What is the average particle size of cement?
a) 15 microns
b) 45 microns
c) 75 microns
d) 100 microns

Answer: a
Explanation: Approximately 95% of cement particles are smaller than 45 microns and the average particle size is 15 microns.

Q. 4. What is the meaning of soundness of cement?
a) Ability to flow when mixed
b) Ability to make ringing noise when struck
c) Ability to form strong and sound structure
d) Ability to retain volume after setting.

Answer: d
Explanation: When cement paste hardens and sets, it should not undergo any volume change. Soundness ensures this and is tested using Autoclave expansion test.

Q. 5. Time elapsed from the instance of adding water until paste ceases to behave as fluid is called:
a) Initial setting time
b) Final setting time
c) Intermediate setting time

Answer: a
Explanation: Final setting time is the time required for cement paste to reach a certain state of hardness. Option c and d does not exist.

Q. 6. Which of the below mentioned is not a result of field test performed on cement?
a) There should not be any lumps
b) It should feel cold when you put your hand in bag of cement
c) The colour should be blackish grey
d) It should not be gritty when rubbed with finger

Answer: c
Explanation: The colour of cement is normally grey with a greenish tint. There are different shades – lighter and darker, but it does not go as dark as blackish grey.

Q. 7. Which equipment is used to test the setting time of cement?
a) Core cutter
b) Vibrator
c) Universal testing machine (UTM)
d) Vicat apparatus

Answer: d
Explanation: Core cutter is used to determine dry density of soil. Vibrator is used in sieve analysis. UTM can be used to test various parameters – tension, bending, shear of various materials. Vicat apparatus consists of a needle, used to penetrate the cement paste sample.

Q. 8. What is the initial setting time of cement?
a) 1 hour
b) 30 minutes
c) 15 minutes
d) 30 hours

Answer: b
Explanation: As per IS code 4031-part 5, the initial setting time of cement is minimum of 30 minutes. After this cement will start losing its plasticity and will not be workable.

Q. 9. Use of coarser cement particles leads to:
a) Low durability
b) Higher strength
c) Low consistency
d) Higher soundness

Answer: a
Explanation: For coarser particles, hydration starts on the surface of particles, hence, it might not be completely hydrated. This causes low strength and low durability.

Q. 10. Wet cement can cause severe skin burns if not washed off with water immediately.
a) True
b) False

Answer: a
Explanation: Cement is highly alkaline and setting process is exothermic. Wet cement is strongly caustic and causes skin burns. Similarly, dry cement causes eye or respiratory irritation, when it comes in contact with mucous membranes.

Q. 11. Green cement is:
a) Green coloured cement
b) Cement mixed with plant products
c) Cement mixed with recycled materials

Answer: c
Explanation: Green cement is a cementitious material which employs the use of optimized recycled materials. These can meet or even exceed the functional performance of Portland cement.

Q. 12. What is the depth the needle in Vicat apparatus should penetrate into the cement paste in consistency test?
a) 33-35 cm from bottom of the mould
b) 33-35 mm from top of the mould
c) 33-35 cm from top of the mould
d) 33-35 mm from bottom of the mould

Answer: b
Explanation: The best procedure has been clearly mentioned in IS 4031 Part 4. According to the code, 33-35mm depth of penetration is ideal.

Q. 13. Why is natural cement used very limitedly?
a) Brown in Colour
b) Standard consistency is not met with
c) Sets too quickly
d) Particle size is too fine

Answer: c
Explanation: Natural cement sets very quickly after the addition of water and hence it is not quite workable. Artificial cement is preferred over this.

Q. 14. Who invented Portland cement and in which year?
a) William Aspdin, 1824
b) William Aspdin, 1840s
c) Joseph Aspdin, 1840s
d) Joseph Aspdin, 1824

Answer: b
Explanation: Joseph Aspdin patented Portland cement in 1824. William Aspdin, his son is regarded as the inventor of modern Portland cement due to his developments in 1840s.

Q. 15. What is the average particle size of cement?
a) 15 microns
b) 45 microns
c) 75 microns
d) 100 microns

Answer: a
Explanation: Approximately 95% of cement particles are smaller than 45 microns and the average particle size is 15 microns.

Q. 16. What is the meaning of soundness of cement?
a) Ability to flow when mixed
b) Ability to make ringing noise when struck
c) Ability to form strong and sound structure
d) Ability to retain volume after setting.

Answer: d
Explanation: When cement paste hardens and sets, it should not undergo any volume change. Soundness ensures this and is tested using Autoclave expansion test.

Q. 17. Time elapsed from the instance of adding water until paste ceases to behave as fluid is called:
a) Initial setting time
b) Final setting time
c) Intermediate setting time
d) Absolute setting time

Answer: a
Explanation: Final setting time is the time required for cement paste to reach a certain state of hardness. Option c and d does not exist.

Q. 18 . Which of the below mentioned is not a result of field test performed on cement?
a) There should not be any lumps
b) It should feel cold when you put your hand in bag of cement
c) The colour should be blackish grey
d) It should not be gritty when rubbed with finger

Answer: c
Explanation: The colour of cement is normally grey with a greenish tint. There are different shades – lighter and darker, but it does not go as dark as blackish grey.

Q. 19. Which equipment is used to test the setting time of cement?
a) Core cutter
b) Vibrator
c) Universal testing machine (UTM)
d) Vicat apparatus

Answer: d
Explanation: Core cutter is used to determine dry density of soil. Vibrator is used in sieve analysis. UTM can be used to test various parameters – tension, bending, shear of various materials. Vicat apparatus consists of a needle, used to penetrate the cement paste sample.

Q.20. What is the initial setting time of cement?
a) 1 hour
b) 30 minutes
c) 15 minutes
d) 30 hours

Answer: b
Explanation: As per IS code 4031-part 5, the initial setting time of cement is minimum of 30 minutes. After this cement will start losing its plasticity and will not be workable.

Q.21 . Use of coarser cement particles leads to:
a) Low durability
b) Higher strength
c) Low consistency
d) Higher soundness

Answer: a
Explanation: For coarser particles, hydration starts on the surface of particles, hence, it might not be completely hydrated. This causes low strength and low durability.

Q. 22. Wet cement can cause severe skin burns if not washed off with water immediately.
a) True
b) False

Answer: a
Explanation: Cement is highly alkaline and setting process is exothermic. Wet cement is strongly caustic and causes skin burns. Similarly, dry cement causes eye or respiratory irritation, when it comes in contact with mucous membranes.

Q. 23. Green cement is:
a) Green coloured cement
b) Cement mixed with plant products
c) Cement mixed with recycled materials
d) Cement mixed with green algae

Answer: c
Explanation: Green cement is a cementitious material which employs the use of optimized recycled materials. These can meet or even exceed the functional performance of Portland cement.

Q. 24. What is the depth the needle in Vicat apparatus should penetrate into the cement paste in consistency test?
a) 33-35 cm from bottom of the mould
b) 33-35 mm from top of the mould
c) 33-35 cm from top of the mould
d) 33-35 mm from bottom of the mould

Answer: b
Explanation: The best procedure has been clearly mentioned in IS 4031 Part 4. According to the code, 33-35mm depth of penetration is ideal.

Q.25 . What is the abbreviation of PPC?
a) Perfect Portland Cement
b) Portland Produced Cement
c) Portland Pozzolana Cement
d) Productive Portland Cement

Answer: c
Explanation: Pozzolana is a material containing silica. PPC is formed by intergrinding ordinary Portland cement, clinker, gypsum and pozzolanic material.

Q.26 . Which of the following is not an advantage of rapid hardening cement?
a) Faster construction
b) Short curing period
c) Light in weight
d) Higher final setting time

Answer: d
Explanation: The initial and final setting time of rapid hardening cement is the same as that of ordinary cement. It attains higher strength in less time. It develops the same strength of ordinary cement in four days rather than 28 days.

Q.27 . High alumina cement can be used for massive concrete work.
a) True
b) False

Answer: b
Explanation: High alumina cement is obtained by adding 55% bauxite and 35-45% lime. It hardens rapidly and it is costlier. It cannot be used for massive concrete work.

Q.28 . How many types of cement are there based on the ability to set in presence of water?
a) 2
b) 3
c) 4
d) 5

Answer: a
Explanation: The 2 types are hydraulic and non-hydraulic cement. Hydraulic cement sets and becomes adhesive due to reaction with water. Non-hydraulic cement does not set under-water or in wet conditions.

Q.29 . What property does air-entraining cement provide?
a) Workability
b) Soundness
c) Fineness
d) Strength

Answer: a
Explanation: Air-entraining agents are added to cement during manufacturing. These create voids and in turn increases workability when used in concrete.

Q.30 . Which of the following types of cement is used in marine structures?
a) Expanding cement
b) High alumina cement
c) Blast furnace slag cement
d) White cement

Answer: c
Explanation: Blast furnace slag cement is obtained by combining slag and cement clinkers. These have less heat of hydration and are not affected by sea water. Hence, can be used for marine structures.

Q.31 . Which pair of the compound and coloured cement mentioned below is wrong?
a) Iron oxide-yellow
b) Cobalt-black
c) Chromium oxide-green
d) Manganese dioxide-brown

Answer: b
Explanation: Cobalt imparts blue colour to cement. Iron oxide in different proportion imparts brown, red and yellow colour. Manganese dioxide produces brown and black coloured cement.

Q.32 . Low heat cement is ideal for use in the construction of dams.
a) True
b) False

Answer: a
Explanation: Heat of hydration is heat produced during chemical action between cement and water. In mass concreting works (dam) heat will be high and effect the stability of a structure. Hence, low heat cement is ideal for use.

Q.33 . Which of the following is not a pozzolanic material?
a) Fly ash
b) Silica fume
c) Cinder
d) Slag

Answer: c
Explanation: Pozzolans are silicate based materials that form cementitious materials. Fly ash, silica fumes and slag are composed of oxide of silicon. Cinder is a coal residue.

Q.34 . Water proof cement is prepared by mixing ordinary cement with:
a) Resins
b) Water repellent chemicals
c) Sulpho-aminate
d) Metal stearates

Answer: d
Explanation: Resins are added in air entraining cement. Water repellent chemicals in hydrophobic cement. Sulpho-aminate is added in expanding cement. Metal stearates (Ca, Al, etc) are added in small percentage during grinding to get water proof cement.

Q.35 . What does grade 33 cement indicate?
a) Tensile strength of 33 kN/m^2
b) Tensile strength of 33 N/mm^2
c) Compressive strength of 33 kN/m^2
d) Compressive strength of 33 N/mm^2

Answer: d
Explanation: The grades of cement are specified by IS 1489-1991. Cements are usually graded based on their compressive strength.

Q.36. Ordinary Portland cement (OPC) has been classified into how many grades?
a) 2
b) 3
c) 10
d) 5

Answer: b
Explanation: There was only one grade of OPC before 1987 and was according to IS 269-1976. It was revised in 1991 and IS 1489-1991 included 3 grades namely, 33 grade, 43 grade and 53 grade.

Q.37 . Grade 43 OPC is used widely for:
a) High rise buildings
b) Plastering
c) House construction
d) Finishing works

Answer: c
Explanation: Grade 43 OPC has higher strength than grade 33 and lower than grade 53. Grade 33 used for finishing works under normal condition. Grade 53 is used for high rise building.

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02 Aggregates	Marks:-10
Content of Chapter:- 2.1 Aggregates: Requirement of good aggregates, Classification according to source 2.2 Fine aggregates: Properties, size 2.3 Coarse aggregates: Properties, size, shape 2.4 Water: Quality of water, impurities in mixing water.	

Q.1. Fine Aggregates should pass through which IS sieve?
a) 2.35mm
b) 45µ
c) 4.75mm
d) 75µ

Answer: c
Explanation: 4.75mm IS sieve is the aggregate size deciding sieve. Anything retained on sieve is coarse aggregate and the ones that pass through sieve are fine aggregates.

Q.2. How many types of fine aggregates are there based on source?
a) 3
b) 2
c) 4
d) 6

Answer: a
Explanation: Three types are natural sand (river banks), crushed stone sand (hard stone) and crushed gravel sand (gravel).

Q.3. What is the fineness modulus value of a fine sand?
a) <2.2
b) 2.2-2.6
c) <1
d) 1-2

Answer: b
Explanation: Based on the fineness of sand, there are very fine sand, fine sand, medium sand, coarse sand and very coarse sand. Fine sand has fineness modulus between 2.2-2.6.

Q.4. M-Sand has _____ type of particle shape.
a) Flaky
b) Round
c) Angular
d) Cubical

Answer: d
Explanation: The stone is crushed to obtain M-Sand. The shape of the crushed stone is cubical and it has rounded edges.

Q.5. Which of the below can be used as fine aggregates?
a) Lime
b) Splinters
c) Surkhi
d) Rice Husk

Answer: c
Explanation: Surkhi consists of broken brick pieces. They can be ground to the size of fine aggregates.

Q.6. The specific gravity for sand is:
a) 2.6
b) 2.65
c) 2.8
d) 2.75

Answer: a
Explanation: As per the results from specific gravity test in pycnometer, this specific gravity for sand is 2.6.

Q.7. In the ratio 1:4:8, which number indicates the quantity of fine aggregates?
a) 1
b) 4
c) 8
d) None

Answer: b
Explanation: For plain cement concrete (PCC), ratio 1:4:8 is usually used. The ratio is of cement: fine aggregates: coarse aggregates. Hence, 4 is the quantity of fine aggregates.

Q.8. PGBS stands for:
a) Perfectly Graded Blast furnace Slag
b) Pre-Grinded Blast furnace Slag
c) Poly Granule Blast furnace Slag
d) Processed Granulated Blast furnace Slag

Answer: d
Explanation: It is obtained by processing the waste by-product from the iron industry. It is now being used as an alternative to river sand.

Q.9. Coarse aggregates are classified into how many groups?
a) 3
b) 4
c) 6
d) 2

Answer: d
Explanation: The two main groups of coarse aggregates are single-sized aggregates and graded aggregates.

Q.10. How much percent of material which passes through a specific sieve is contained in that single-size aggregate?
a) 50-60%
b) 85-100%
c) 70-90%
d) 80-85%

Answer: b
Explanation: Single-size aggregate contains mostly one sieve sized particle. 85-100% of the particular size should be there, with 0-25% of such aggregate retaining on next lower sieve.

Q.11. Graded aggregate contains particles of size:
a) Single grade
b) 4.75mm
c) Multi grade
d) <80mm

Answer: c
Explanation: It consists of aggregates of more than one single grade. It ideally contains particles of size 4.75mm and above in a proportionate amount.

Q.12. Flaky particles have:
a) Small thickness
b) Elongated sides
c) Sharp edges
d) Rounded edges

Answer: a
Explanation: Flaky particles have a small thickness compared to the dimensions of other parameters that is width and length.

Q.13. Which size coarse aggregate is ideal for use in a concrete mix?
a) Smaller
b) 4.75-10mm
c) Larger
d) 10-20mm

Answer: c
Explanation: Using the largest size will result in a reduction of cement, water and shrinkage in the concrete mix.

Q.14. Elongation index of coarse aggregates is calculated using:
a) $E=w_1/w_2$
b) $E=w_2/w_1$
c) $E=w_2-w_1$
d) $E=w_2+w_1$

Answer: a
Explanation: Elongation index is obtained as a percentage. $E=w_1/w_2$ where w_1 is the weight of particles retained in length gauge and w_2 is the weight of test sample.

Q.15. In crushing test on coarse aggregates, what size particle is taken as a sample?
a) Passing 12.5mm IS sieve
b) Retained on 10mm IS sieve
c) Passing 10mm and retained on 4.75mm IS sieve
d) Passing 12.5mm and retained on 10mm IS sieve

Answer: d
Explanation: As per IS code 383, the sample should contain those aggregates which pass through 12.5mm sieve and are retained on 10mm IS sieve.

Q.16. What is the density of undisturbed gravel?
a) 2630-2760 kg/cum
b) 1920-2160 kg/cum
c) 1600 kg/cum
d) 1200 kg/cum

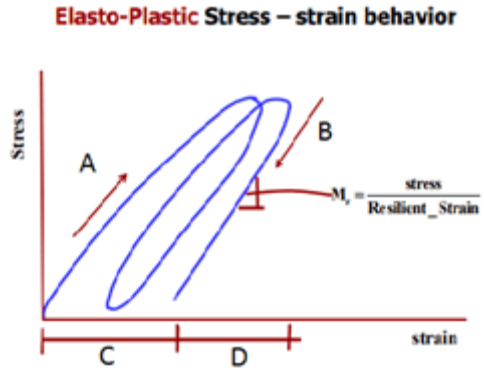
Answer: b
Explanation: 2630-2760 kg/cum is a density of granite. 1600 kg/cum is of loose gravel and 1200 kg/cum is that of brick ballast.

Q.17. What is the symbol used for well graded gravel as per ISC system of classification?
a) WG
b) G
c) GW
d) W

Answer: c
Explanation: Classification of coarse grained soils (ISC system) gives the symbol for well graded gravel as GW. For poorly graded, it is GP.

Q.18 . Gravel is a type of:
a) Rounded aggregate
b) Angular aggregate
c) Flaky aggregate
d) Irregular aggregate

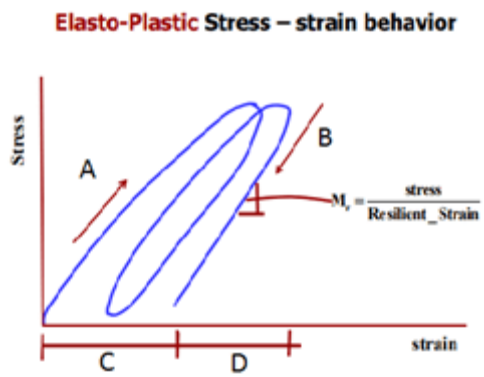
Answer: d
Explanation: All gravel particles have an irregular shape and sharp edge. Sand has a rounded shape. Laminated rocks have flaky shape and crushed rocks have an angular shape.



a) Unloading
b) Loading
c) Permanent strain unrecovered
d) Resilient strain recovered

Answer: b
Explanation: According to Highway Construction and Maintenance, they prepared a graph of aggregates for stress vs strain in which stress is increasing wrt strain at first i.e. loading.

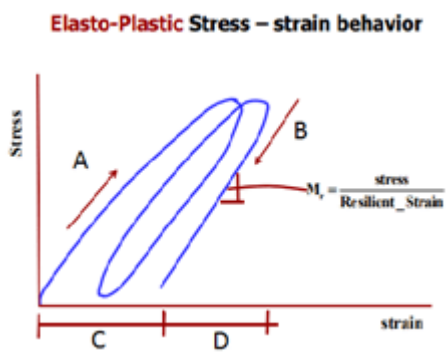
Q. 20 . What is B in the following figure?



a) Unloading
b) Loading
c) Permanent strain unrecovered
d) Resilient strain recovered

Answer: a
Explanation: According to Highway Construction and Maintenance, they prepared a graph of aggregates for stress vs strain in which stress is decreasing wrt strain after a period of time i.e. unloading.

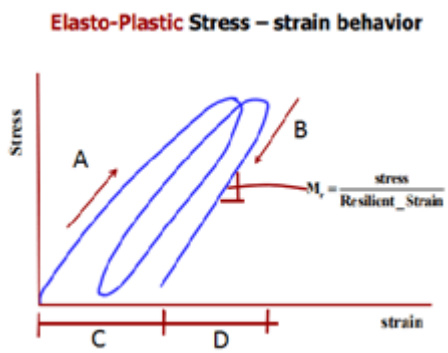
C?



a) Unloading
b) Loading
c) Permanent strain unrecovered
d) Resilient strain recovered

Answer: c
Explanation: According to Highway Construction and Maintenance, they prepared a graph of aggregates for stress vs strain in which they came to a conclusion C is Permanent strain unrecovered.

Q. 22. From the graph below, what is D?



a) Unloading
b) Loading
c) Permanent strain unrecovered
d) Resilient strain recovered

Answer: d
Explanation: According to Highway Construction and Maintenance, they prepared a graph of aggregates for stress vs strain, where D is resilient strain recovered.

Q. 23 . A maximum value of ___ percent is allowed for WBM base course in Indian conditions.
a) 25
b) 35
c) 40
d) 50

Answer: c
Explanation: A maximum value of 40%age is allowed for WBM base course in Indian conditions.

Q. 24 . Aggregates to be used for wearing course, the impact value shouldn't exceed _____ percent.
a) 30
b) 35
c) 40
d) 25

Answer: a
Explanation: Aggregates to be used for wearing course, the impact value shouldn't exceed 30 %. For bituminous macadam the maximum permissible value is 35 %.

Q. 25 . The loss in weight should not exceed _____ percent when tested with sodium sulphate and _____ percent with magnesium sulphate solution.
a) 12, 18
b) 18, 12
c) 10, 15
d) 15, 10

Answer: a
Explanation: The loss in weight should not exceed 12 percent when tested with sodium sulphate and 18 percent with magnesium sulphate solution.

Q. 26. What do you mean by bulking?
a) The volume increase of fine aggregate due to presence of moisture content in it
b) The moisture present in aggregate forms a film around each particle
c) Fine aggregate shows completely realistic volume
d) The state of setting someone or something apart from others

Answer: a
Explanation: The volume increase of fine aggregate due to presence of moisture content is known as bulking. Fine sand bulks more as compared to coarse sand.

Q. 27 . Fine aggregate do not show any bulking when it is absolutely dry.
a) True
b) False

Answer: a
Explanation: Fine aggregate do not show any bulking when it is absolutely dry or completely saturated.

Q. 28. What is the percentage of bulk if fine aggregates manufactured by extremely fine sand?
a) 20
b) 30
c) 40
d) 50

Answer: c
Explanation: Extremely fine sand particularly the manufactured fine aggregate bulks as much as about 40%.

Q. 29 . Bulking _____ with increase in moisture.
a) Increase
b) Decrease
c) First increase then decrease
d) First decrease then increase

Answer: c
Explanation: Bulking increases with increase in moisture content upto a certain limit and beyond that the further increase in moisture content results in decrease in volume.

Q.30 . Fine sand bulks _____ than coarse sand.
a) Less
b) More
c) Equal
d) Depends on volume

Answer: b
Explanation: Fine sand bulks more as compared to coarse sand, i.e. percentage of bulking in indirectly proportional to the size of particle.

Q. 31 . If h = height of sand when moist and h1 is the height when saturated then what is the percentage of bulking?
a) {(h-h1)/h1}*100
b) {(h1-h)/h1}*100
c) {(h-h1)/h}*100
d) {(h1-h)/h}*100

Answer: a
Explanation: It is the formula to calculate the percentage of bulking. Percentage in bulking = {(h-h1)/h1}*100.

Q. 32 . Which apparatus we don't need to calculate the bulking of fine aggregates?
a) Measuring cylinder
b) Weighing balance
c) Steel rule
d) Vicat's mould

Answer: d
Explanation: Vicat's mould don't come in use to calculate the bulking percentage because it is used to find initial and final setting time.

Q. 33 . What is bulking of coarse aggregates?
a) More than sand
b) Less than sand
c) Equal than sand
d) Negligible

Answer: d
Explanation: Bulking is indirectly proportional to the particle size of the aggregates. Size of coarse aggregates is more hence negligible bulking.

Q. 34 . If the moisture content of 5 to 10% by weight, then the bulking of sand is increased by _____
a) 20
b) 30
c) 40
d) 50

Answer: d
Explanation: With the moisture content of 5 to 10% by weight, the bulking of sand is increased by 50.

Q. 35 . When sand is fully dry then it's volume is _____
a) Equal
b) Less
c) More
d) Can't say

Answer: a
Explanation: When the sand is fully dry then there is 0 bulking in it. Therefore, the volume of the same will be same.

Q. 36 . In crushing test, dry aggregates passing through _____ mm sieve and retained _____ mm in a cylinder.
a) 12.5, 10
b) 11.5, 10
c) 12.5, 11.5
d) 10, 2.36

Answer: a
Explanation: Dry aggregates passing through 12.5 mm sieves and retained 10 mm sieves are filled in a cylindrical measure of 11.5 mm diameter and 18 cm height in three layers.

Q. 37 . According to IS: 2386 part-IV, each layer is tamped _____ times in crushing test.
a) 20
b) 25
c) 30
d) 10

Answer: b
Explanation: Each layer is tamped 25 times with at standard tamping rod. The test sample is weighed and placed in the test cylinder in three layers each layer being tamped again.

Q. 38. A value less than 10 signifies an exceptionally _____ while above 35 would normally be regarded as _____
a) Strong aggregates, weak aggregates
b) Weak aggregates, strong aggregates
c) Strong aggregates, strong aggregates
d) Weak aggregates, weak aggregates

Answer: a
Explanation: A value less than 10 signifies an exceptionally strong aggregate while above 35 would normally be regarded as weak aggregates.

Q. 39 . Los Angeles machine consists of circular drum of internal diameter _____ mm and length _____ mm.
a) 700, 700
b) 520, 520
c) 520, 700
d) 700, 520

Answer: d
Explanation: Los Angeles machine consists of circular drum of internal diameter 700 mm and length 520 mm mounted on horizontal axis enabling it to be rotated.

Q. 40. Which machine is preferred for abrasion test?
a) Vicat's mould
b) Los Angeles
c) Flakiness Gauge
d) Elongation Gauge

Answer: b
Explanation: Los Angeles is preffered for abrasion test for carrying out the hardness property and has been standardized in India.

Q. 41 . A maximum value of _____ percent is allowed for WBM base course in Indian conditions.
a) 25
b) 35
c) 40
d) 50

Answer: c
Explanation: The aggregate crushing value provides a relative measure of a maximum value of 40%age is allowed for WBM base course in Indian conditions.

Q.42 . Aggregates to be used for wearing course, the impact value shouldn't exceed _____ percent.
a) 30
b) 35
c) 40
d) 25

Answer: a
Explanation: Aggregates to be used for wearing course, the impact value shouldn't exceed 30 %. For bituminous macadam the maximum permissible value is 35 %.

Q.43 . What is the range of water absorption of aggregates used in road?
a) 2.5-2.9
b) .1-2
c) .1-2.5
d) 2-2.9

Answer: b
Explanation: The specific gravity of aggregates normally used in road ranges from about 2.5 to 2.9. Water absorption values range from 0.1 to about 2.0 percent for aggregates normally used in road surfacing.

Q.44 . The loss in weight should not exceed _____ percent when tested with sodium sulphate and _____ percent with magnesium sulphate solution.
a) 12, 18
b) 18, 12
c) 10, 15
d) 15, 10

Answer: a
Explanation: The loss in weight should not exceed 12 percent when tested with sodium sulphate and 18 percent with magnesium sulphate solution.

Q. 45 . If 60% aggregates doesn't pass through the 2.36mm sieve, then what would be the value of Aggregate impact value?
a) 60%
b) 40%
c) 25%
d) 100%

Answer: b
Explanation: Aggregate impact value = (W1/W2)*100
= {(100-60)/100} * 100
= 40%.

Q. 46 . Pick up the most appropriate statement from the following.
a) Bulk density of normal weight aggregate is 1600 kg/m^3
b) Bulk density of normal weight aggregate is 2000 kg/m^3
c) Bulk density of normal weight aggregate is 1000 kg/m^3
d) Bulk density of normal weight aggregate is 1250 kg/m^3

Answer: a
Explanation: Bulk density of normal weight aggregate is around 1520 to 1680 kg/m^3 and the rest of the options don't come under that range.

Q. 47 . The 28 days cube strength of mass concrete using aggregates of maximum size 5 cm for gravity dams should be _____

a) Between 150 to 300 kg/cm^2
b) Between 350 to 600 kg/cm^2
c) Between 150 to 400 kg/cm^2
d) Less than 200 kg/cm^2

Answer: d

Explanation: The 28 days cube strength of mass concrete using aggregates of maximum size 5 cm for gravity dams should be less than 200 kg/cm^2.

Q. 48 . The unit weight of heavy weight concrete varies from _____ kg/m^3.

a) 1000
b) 2400
c) 2000
d) 1400

Answer: b

Explanation: The unit weight of heavy weight concrete varies from 2400 kg/m^3 with sp.gr range from 4.0 to 4.6. (eg: mineral ore sand barite).

Q. 49. The use of crushed aggregates may results in 10 to 20% higher compressive strength.

a) True
b) False

Answer: a

Explanation: The use of crushed aggregates may results in 10 to 20% higher compressive strength due to development of stronger aggregate-mortar bond.

Q.50 . S.I. unit of bulk density is?

a) kg/l
b) g/ml
c) kg/ml
d) g/l

Answer: a

Explanation: Bulk density of an aggregate is defined as the mass of material in a given volume and expressed in kg/l.

Q. 51 . What is void ratio?

a) 1 – (bulk density/apparent sp gr)
b) (bulk density/apparent sp gr) – 1
c) 1 – bulk density/apparent sp gr
d) bulk density/apparent sp gr – 1

Answer: a

Explanation: The empty space between the aggregates particles are termed as voids. And the corresponding ratio will be calculated by the given formula.

Q.52 . The average specific gravity of natural aggregate is?
a) 2.7
b) 3
c) 1.5
d) 1

Answer: a
Explanation: The average specific gravity of majority of natural aggregates lies between 2.6 and 2.8.

Q. 53. Pick up the most appropriate statement from the following.
a) Sp. Gr. = c/a-b
b) Sp. Gr. = c/(a-b)
c) Sp. Gr. = a-b/c
d) Sp. Gr. = (a-b)/c

Answer: b
Explanation: Specific gravity is the ratio of the density of a substance to the density of a reference substance; equivalently, it is the ratio of the mass of a substance to the mass of a reference substance for the same given volume.

Q. 54 . The ratio of the mass of the aggregate dried in an oven at _____ for 24 hours to the mass of the water occupying a volume equal to that of solid.
a) 100-110°C
b) 150-180°C
c) 100°C
d) 1500°C

Answer: a
Explanation: First sieve the sample aggregate, aggregate passing 12.5mm sieve and retaining 10mm sieve is oven dries at 100-110°C for 3-4 hrs.

Q. 55 . Aggregate abrasion value is determined by_____
a) Aggregates crushing strength
b) Los Angeles abrasion test
c) Aggregates Impact value test
d) Ten percent fine test

Answer: b
Explanation: Aggregate abrasion value is determined by Los Angeles abrasion test as described in IS: 2386.

Q. 56 . What do you mean by bulking?
a) The volume increase of fine aggregate due to presence of moisture content in it
b) The moisture present in aggregate forms a film around each particle
c) Fine aggregate shows completely realistic volume
d) The state of setting someone or something apart from others

Answer: a
Explanation: The volume increase of fine aggregate due to presence of moisture content is known as bulking. Fine sand bulks more as compared to coarse sand.

Q. 57 . Fine aggregate do not show any bulking when it is absolutely dry.
a) True
b) False

Answer: a
Explanation: Fine aggregate do not show any bulking when it is absolutely dry or completely saturated.

Q. 58 . What is the percentage of bulk if fine aggregates manufactured by extremely fine sand?
a) 20
b) 30
c) 40
d) 50

Answer: c
Explanation: Extremely fine sand particularly the manufactured fine aggregate bulks as much as about 40%.

Q. 59 . Bulking _____ with increase in moisture.
a) Increase
b) Decrease
c) First increase then decrease
d) First decrease then increase

Answer: c
Explanation: Bulking increases with increase in moisture content upto a certain limit and beyond that the further increase in moisture content results in decrease in volume.

Q. 60 . Fine sand bulks _____ than coarse sand.
a) Less
b) More
c) Equal
d) Depends on volume

Answer: b
Explanation: Fine sand bulks more as compared to coarse sand, i.e. percentage of bulking in indirectly proportional to the size of particle.

Q. 61 . If h = height of sand when moist and h1 is the height when saturated then what is the percentage of bulking?
a) {(h-h1)/h1}*100
b) {(h1-h)/h1}*100
c) {(h-h1)/h}*100
d) {(h1-h)/h}*100

Answer: a
Explanation: It is the formula to calculate the percentage of bulking. Percentage in bulking = {(h-h1)/h1}*100.

Q. 62 . Which apparatus we don't need to calculate the bulking of fine aggregates?
a) Measuring cylinder
b) Weighing balance
c) Steel rule
d) Vicat's mould

Answer: d
Explanation: Vicat's mould don't come in use to calculate the bulking percentage because it is used to find initial and final setting time.

Q. 63. What is bulking of coarse aggregates?
a) More than sand
b) Less than sand
c) Equal than sand
d) Negligible

Answer: d
Explanation: Bulking is indirectly proportional to the particle size of the aggregates. Size of coarse aggregates is more hence negligible bulking.

Q. 64 . If the moisture content of 5 to 10% by weight, then the bulking of sand is increased by _____
a) 20
b) 30
c) 40
d) 50

Answer: d
Explanation: With the moisture content of 5 to 10% by weight, the bulking of sand is increased by 50.

Q. 65 . When sand is fully dry then it's volume is _____
a) Equal
b) Less
c) More
d) Can't say

Answer: a
Explanation: When the sand is fully dry then there is 0 bulking in it. Therefore, the volume of the same will be same

Q. 66 . Aggregate abrasion value is determined by_____
a) Aggregates crushing strength
b) Los Angeles abrasion test
c) Aggregates Impact value test
d) Ten percent fine test
View Answer

Answer: b
Explanation: Aggregate abrasion value is determined by Los Angeles abrasion test as described in IS: 2386.

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03 – Concrete	Marks:-14
Content of Chapter:- 3.1 Concrete: Necessity of supervision for concreting operation 3.2 Water cement ratio Duff Abraham w/c law, significance of w/c ratio 3.3 Properties of fresh concrete: Workability. Factors affecting workability of 3.4 Properties of Hardened concrete: compressive strength.	

Q.1. How many components are mainly used to prepare concrete?
a) 5
b) 3
c) 2
d) 4

Answer: d
Explanation: Concrete is prepared by mixing cement, fine aggregate, coarse aggregate with water. It is a thick paste and hence has high bulk density.

Q. 2. **Which of the below is the most common alternative to cement in concrete?**
a) Slag
b) Fly ash
c) Asphalt
d) Lime

Answer: c
Explanation: Asphalt is the highly cementitious material. It possesses almost all qualities of cement and is widely used as an alternative to cement.

Q. 3. What is the ideal water-cement ratio to be used while hand mixing?
a) 0.4-0.5
b) 0.5-0.6
c) 0.6-1
d) 1.6-2

Answer: b
Explanation: Ideal water cement ratio for general works is 0.45. During machine mixing, it can be in the range of 0.4-0.5. Hand mixing is done by labourers and maximum 0.6 can be allowed.

Q. 4. Which IS code gives details regarding water to be used in concrete?
a) IS 456
b) IS 383
c) IS 565
d) IS 3012

Answer: a
Explanation: Normally, potable water is to be used for preparing concrete. In the case where potable water is not available, a certain amount of impurities are permissible in the water to be used. Those are given in Table in IS 456.

Q. 5. **How many types of chemical admixture are there?**
a) 2
b) 3
c) 4
d) 5

Answer: c
Explanation: Admixtures are compounds added to concrete to attain specific properties. The chemical admixtures are added in small amounts. The 4 types are accelerators, retarders, plasticizers and air entraining agents.

Q. 6. Retarders are used for:
a) Construction of high rise building
b) Repair works
c) Cold weather conditions
d) Grouting deep oil wells

Answer: d
Explanation: Retarders are used to slow down the initial rate of hydration and extend the initial setting time. It is therefore used to grout deep oil wells, transport RMC (Ready Made Concrete) and avoid cold joints. Accelerator is used for first 3 options.

Q. 7. **_____ is added to make white concrete.**
a) Fly ash
b) Metakaolin
c) Rise husk
d) Pigments

Answer: b
Explanation: Fly ash, Rise husk are dark in colour. Metakaolin is usually bright white in colour and is the preferred choice for architectural concrete where appearance is important.

Q. 8. As water cement ratio increases, _____ also increases.
a) Compressive strength
b) Tensile strength
c) Bleeding
d) Workability

Answer: d
Explanation: More water improves the workability of a mix, but compromises on the strength requirements. Hence, ideal w/c ratio of 0.45 is to be used.

Q. 9. Which of the below is an example of plasticizer?
a) Hydroxylated carboxylic acid
b) Fluoro-silicate
c) Gypsum
d) Surkhi

Answer: a
Explanation: Fluoro-silicate is an accelerator. Gypsum is a retarder and surkhi is a type of mineral admixture.

Q. 10. Which component of concrete gives it desired compressive strength?
a) Water
b) Cement
c) Aggregates
d) Admixture

Answer: c
Explanation: Aggregates used are sand, gravel or crushed stones. These have high compressive strength. Concrete is strong in compression and weak in tension due to this reason.

Q. 11. What is the ratio of the component in grade M20 concrete?
a) 1:3:6
b) 1:1.5:3
c) 1:1:2
d) 1:2:4

Answer: b
Explanation: Concrete is graded into many types as per IS 456-2000. M stands for mix and the number, say, 20 is a compressive strength after 28 days in N/mm^2. Generally, M20 grade is used. The ratio of cement: fine: coarse aggregate for M20 is 1:1.5:3. For M10 it is 1:3:6, M15 it is 1:2:4 and M25 it is 1:1:2.

Q. 12. Which process comes after batching in manufacture process?
a) Transportation
b) Placing
c) Mixing
d) Compacting

Answer: c
Explanation: Batching involves measuring the amount of raw materials required for the manufacture of concrete. The next step is to mix all these ingredients together.

Q.13 . Ready mix plant and central mix plant differ in:
a) Transportation
b) Setting time
c) Properties
d) Water addition

Answer: d
Explanation: In ready mix plants, all the other ingredients are mixed, except water. While in central mix plants, water is also mixed along with other ingredients.

Q. 14. How many methods of batching are there?
a) 2
b) 3
c) 5
d) 6

Answer: a
Explanation: There are 2 types of batching – weigh and volume batching. In volume batching, volumetric measure of materials is taken (1 bag cement-35 litre). In weigh batching, measurement is in terms of weight (1 bag cement-50 kg).

Q. 15 . What is the maximum height through which concrete can be poured?
a) 0.1-0.6 m
b) 0.8-1 m
c) 0.5 m
d) 2 m

Answer: b
Explanation: Concrete consists of coarse aggregates. If it is placed or poured from a height above 1 m, segregation of coarse aggregate will take place, leading to improper distribution. It affects the strength parameter.

Q. 16 . How many types of machine mixers are available?
a) 2
b) 5
c) 6
d) 3

Answer: d
Explanation: Based on the technique of discharging mixed concrete, there are 3 types of mixers available. They are tilting type, non-tilting type and pan type mixers.

Q.17 . In small works, concrete is transported using:
a) Conveyer belts
b) Pumps
c) Pans
d) Buckets

Answer: c
Explanation: In small works, less quantity of concrete is required. So, workers carry it in a pan atop their heads. Conveyer belts and pumps are used for large construction works.

Q. 18 . Compacting is done to:
a) Place concrete on flat surface
b) Remove air bubbles
c) Place concrete on sloping surface
d) Introduce air bubbles

Answer: b
Explanation: While mixing of concrete, sometimes air gets trapped in it in the form of bubbles. These have to be removed to ensure strength parameters are met with.

Q. 19 . Concrete is generally placed on a:
a) Form work
b) Stand
c) Mould
d) Platform

Answer: a
Explanation: Form work is a mould in which concrete is poured and allowed to set. It should be properly oiled and cleaned before pouring concrete. It can be used to cast beams, slabs, columns, etc.

Q. 20 . Which is the best method for curing flat surfaces?
a) Spraying water
b) Placing wet gunny bags
c) Applying curing compounds
d) Stagnating water

Answer: d
Explanation: Curing is the process of maintaining moisture in freshly laid concrete to strengthen it. For flat surfaces like floors and slabs, ponding or stagnating water is the best method. Temporary bund can be made with mortar and filled with water to cure.

Q. 21 . Excess vibration during compacting can lead to:
a) Bleeding
b) Segregation
c) High strength
d) Air bubbles

Answer: b
Explanation: Over vibration may lead to a problem called segregation. The coarse aggregate is separated from the cement matrix. This leads to low strength.

Q.22 . Steam curing is adopted for:
a) Precast structures
b) Columns
c) Beams
d) Walls

Answer: a
Explanation: The precast structures are placed in enclosed chambers. Then the steam is pumped into the chamber. It accelerates the hydration of concrete and it is left for the curing period.

Q. 23 . A gap of 0.3m is to maintained between cement bag and wall, while storing cement.
a) True
b) False

Answer: a
Explanation: The storage of cement is important. It should not be placed too close to the wall or other cement bags to avoid air circulation around bags. It may dampen the cement and make it useless.

Q. 24 . Properties of concrete can broadly be divided into:
a) 8
b) 6
c) 4
d) 2

Answer: d
Explanation: Based on the state of concrete, its properties vary. Concrete in the fresh state has different properties than concrete in a hardened state.

Q. 25 . The accumulation of water on the outer surface of the concrete is:
a) Transpiration
b) Bleeding
c) Guttation
d) Ponding

Answer: b
Explanation: Bleeding can be good as well as bad for fresh concrete. Sometimes due to improper mixing, the water forms a thin layer on the outer surface, by oozing out through voids.

Q. 26 . Which of the below property of aggregates is not desirable?
a) Smooth texture
b) Well graded
c) Angular shape
d) Smaller size

Answer: c
Explanation: Aggregates should provide space for cement paste so as to lubricate the area. The parameters like texture, size, shape, grading are to be considered. Larger size, cubical, round and rough textured aggregates are preferred.

Q. 27 . How does the strength of concrete differ with age of concrete?
a) Increases
b) Decreases
c) No effect
d) Increases, then decreases

Answer: a
Explanation: It increases with increase in age. The strength measured after days, months and years shows an increase. It takes 28 days for concrete to attain full strength. However, it continues to attain strength even after 28 days.

Q.28 . Impermeability is a property of fresh concrete.
a) True
b) False

Answer: b
Explanation: Fresh concrete cannot be judged as impermeable. After it hardens and forms a structure, it may be impervious or pervious. Ideally, it should be impermeable.

Q.29 . Permanent dimension changes due to loading is termed as:
a) Strain
b) Extent
c) Creep
d) Ambit

Answer: c
Explanation: Concrete shrinks with age. The changes in dimension are called creep. It is determined using creep coefficient which is the ratio of ultimate creep strain to elastic strain at the age of loading.

Q. 30 . Which admixture is used to improve workability?
a) Plasticizers
b) Metakaolin
c) Reducers
d) Accelerators

Answer: a
Explanation: Plasticizers help to increase the workability of concrete without altering the water-cement ratio. It is very helpful as it provides the required workability, at the same time does not compromise on strength.

Q. 31 . Workability reduces with time.
a) True
b) False

Answer: a
Explanation: The rate of evaporation of water from concrete mix increases as time increases. Loss of water leads to less workability.

Q.32 . Bleeding is good to an extent if it occurs when concrete is:
a) Transported
b) Mixed
c) Plastic
d) Placed

Answer: c
Explanation: While the concrete is still plastic, the accumulated water due to bleeding can be used to mix concrete again and improve workability. It also benefits by further reducing water-cement ratio.

Q. 33 . M15 concrete is used for:
a) Dams
b) Foundation
c) R.C.C
d) Mass concreting works

Answer: b
Explanation: M10 is used for Mass concrete works, dams, etc. M20 is used for R.C.C. structures. M15 can be used for ground floor construction also.

Q. 34 . In design of R.C.C. structures, the tensile strength of concrete is taken as:
a) 5N/mm^2
b) 2N/mm^2
c) 0.3N/mm^2
d) 0N/mm^2

Answer: d
Explanation: Since concrete does not take up tensile loads, it is taken as zero. But IS 456-2000 recommends the tensile strength to be calculated using $F_t = 0.7\sqrt{fck}$ N/mm^2.

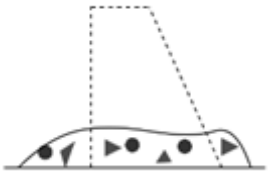
Q. 35 . Higher the cement content,
a) Higher aggregates
b) Lower workability
c) Higher strength
d) Lower strength

Answer: c
Explanation: Higher the cement content i.e. lower the aggregate cement ratio, higher is the strength. It improves workability also.

Q. 36 . Modulus of elasticity, E is calculated using:
a) $E=5000\sqrt{fck}$
b) $E=500\sqrt{fck}$
c) $E=50\sqrt{fck}$
d) $E=5\sqrt{fck}$

Answer: a
Explanation: The modulus of elasticity is found out to determine plastic or elastic nature of concrete. In the formula, f_{ck} is the characteristic strength.

Q. 37 . The figure below represents a:



a) Low slump
b) Normal slump
c) Shear slump
d) Collapse slump

Answer: d
Explanation: In slump test, fresh concrete is filled in a slump cone and it is taken off. The shape of the so formed concrete is represented in the figure above. The concrete has completely collapsed, hence the name.

Q. 38. Tensile strength is found out using:
a) CTM
b) Gradual tensile test
c) Split tensile test
d) Radial tensile test

Answer: c
Explanation: In addition to using characteristic strength fck to determine tensile strength, split tensile test can also be used. It is performed using a UTM.

Q. 39 . Compaction factor for a heavily reinforced section with vibration is:
a) <0.75
b) 0.75-0.85
c) 0.85-0.92
d) >0.92

Answer: c
Explanation: Compaction factor test is conducted to determine the compaction factor. It has different values required for different purposes. To concrete a heavily reinforced section with vibration it is 0.85-0.92.

Q. 40 . The result of Vee-Bee test is expressed in terms of:
a) s
b) m
c) N/mm^2
d) kg

Answer: a
Explanation: The time is tested is Vee-Bee test. Time required to complete remoulding of concrete when subjected to the vibration is measured. It is then expressed in seconds.

Q. 41 . The size of a commonly used specimen for compression test is:
a) 50×30 mm
b) 150x150x150 mm
c) 150x50x50 mm
d) 150×150 mm

Answer: b
Explanation: The commonly used specimen to test compressive strength is a cube. It has 3 dimensions -length, width and height. These cubes are cast in moulds of size 150x150x150mm.

Q. 42 . Concrete is filled in how many layers in slump cone in slump test.
a) 3
b) 2
c) 6
d) 4

Answer: d
Explanation: The fresh concrete is filled in slump cone in 4 layers. Each layer is tamped 25 times with a 16mm pointed rod. The specifications are given in IS 1199.

Q. 43 . Modulus of rupture is calculated using the formula:
a) $f=PL/bd^2$
b) $f=PL^3/3EI$
c) $f=l/6bd^2$
d) $f=Pb/Ld^2$

Answer: a
Explanation: The modulus of rupture is found out dividing maximum moment M/section factor Z. M is given by PL/6 and $Z=1/6bd^2$.

Q. 44 . A slump of 50-100mm can be used for:
a) Mass concreting
b) Strip footing
c) Trench fill
d) Beams

Answer: d
Explanation: Slump of higher value gives greater workability, but yields less strength. A slump of 25-75mm can be used for mass concreting and strip footing. A slump of 100-150cm is used for trench fill.

Q. 45 . How many hoppers are there in compaction factor test?
a) 1
b) 4
c) 2
d) 3

Answer: c
Explanation: There are 2 hoppers and 1 cylinder in the apparatus. Concrete is poured in hopper A (first one). The hinged bottom is opened, concrete falls to 2nd hopper B. Again, hinged bottom is opened, concrete is allowed to fall into cylinder C.

Q. 46 . If cylinder specimen is used to test compressive strength, equivalent cubes strength can be found using:
a) 3/4th strength of cylinder
b) 5/4th strength of cylinder
c) 5/6th strength of cylinder
d) 1/4th strength of cylinder

Answer: b
Explanation: This formula is recommended by IS codes. IS 516 gives the details.

Q 46. Flexure strength is determined as:
a) Modulus of rigidity
b) Modulus of rupture
c) Modulus of plasticity
d) Modulus of elasticity

Answer: b
Explanation: Flexure strength of concrete is defined as the tensile strength of extreme fibre of plain concrete beam. It is determined in terms of modulus of rupture.

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04 – Concrete Mix Design and testing of Concrete	Marks:-16
Content of Chapter:- **4.1** Concrete mix design, objectives, methods of mix design, 4.2 Testing of concrete: Significance of testing 4.3 Non- destructive testing of concrete: Importance of NDT .4 Rebound hammer test, working principle of rebound hammer	

Q.1 For road pavements, the cement generally used, is
(A) Ordinary Portland cement
(B) Rapid hardening cement
(C) Low heat cement
(D) Blast furnace slag cement
Answer: Option B

Q.2 Addition of pozzolana to ordinary port land cement, causes
(A) Decrease in early strength
(B) Reduction in chemical action with sulphates
(C) Increase in shrinkage
(D) All the above
Answer: Option D

Q.3 What is the amount of mixing water used to make LWC?
a) 1/2
b) 2/3
c) 1/4
d) 1/3

Answer: b
Explanation: The general practice for structural light-weight concrete is to mix the aggregate and about 2/3 of the mixing water for a period upto one minute prior to the addition of cement and the balance mixing water.

Q.4 . What is the normal time to get uniform mixing?
a) 30 seconds
b) 2 or more minutes
c) 1 minutes
d) 24 hours

Answer: b
Explanation: Mixing is done continuously as required for homogeneity. Usually, 2 or more minutes are required to get uniform mixing.

Q. 5. The strength of the resulting concrete is _____ % lower than when dry aggregate is used for the same content.
a) 5-10
b) 10-15
c) 15-20
d) 0-5

Answer: a
Explanation: It has been seen that the strength of the resulting concrete is about 5 to 10 percent lower than when dry aggregate is used for the same content and workability.

Q. 6. The density of concrete made with saturated aggregate is _____
a) High
b) Low
c) Very high
d) Very low

Answer: a
Explanation: Moreover, the density of concrete made with saturated aggregate is higher and the durability of such concrete, especially its resistance to frost is lower.

Q. 7. The light-weight concrete is prepared by _____
a) Mixing Portland cement with sawdust in specified proportion in the concrete
b) Using coke-breeze, slag as aggregate in the concrete
c) Mixing Al in the concrete
d) Mixing Fe in the concrete

Answer: b
Explanation: The light-weight concrete is prepared by using coke-breeze, cinder or slag as aggregate in the concrete.

Q. 8. Aerated Concrete is _____
a) Very heavy weight
b) Heavy weight
c) Medium weight
d) Light weight

Answer: d
Explanation: Aerated concrete is also referred to as gas concrete, foam concrete, cellular concrete. In India we have at present a few factories manufacturing aerated concrete.

Q. 9. Air contents should be _____ % by volume.
a) 1-2
b) 2-3
c) 3-4
d) 4-5

Answer: c
Explanation: This type of cement was first of all developed in U.S.A. It is recommended that air contents should be 03-04 % by volume.

Q. 10 . Which one is not used as air entraining agents?
a) Alumina
b) Natural resins
c) Fats
d) Oil

Answer: a
Explanation: Natural resins, fats, oils are used as air entraining agents not alumina.

Q.11. Entrainment of air while applying cement, increases resistance to frost action.
a) True
b) False

Answer: a
Explanation: It is found that entrainment of air or gas bubbles while applying cement, increases resistance to frost action.

Q.12 . Aerated concrete is made in the density of approx. _____ kg/m^3.
a) 50
b) 150
c) 250
d) 350

Answer: d
Explanation: Aerated concrete is made in the density range from 300 kg/m^3 to about 800 kg/m^3.

Q. 13 . No fines concrete is manufactured by _____
a) By adding no fines materials from normal concrete
b) By eliminating no fines materials from normal concrete
c) By reducing its strength
d) By increasing its strength

Answer: b
Explanation: No fines concrete is one type of light weight concrete. As the name indicates that it is a concrete mix without fine aggregate or sand.

Q.14 . Coarse aggregates which has been used in this is of _____
a) 10 mm
b) 20 mm
c) 15 mm
d) 25 mm

Answer: a
Explanation: Normally coarse aggregates passing from 20 mm sieve and retained on 10 mm sieve which is further used for this type of concrete.

Q. 15 . The w/c ratio is kept in the range of _____
a) .1-.2
b) .38-.52
c) .83-1
d) .25-.38

Answer: b
Explanation: The water cement ratio is kept within the range of 0.38-0.52. The water cement ratio should be chosen very carefully considering the cohesive nature of the materials which we are using.

Q.16 . Density of no fines concrete with normal aggregate vary from _____ kg/m^3.
a) 1600-1900
b) <300
c) >2500
d) >300

Answer: a
Explanation: The range of the density of no fines aggregates with the normal aggregates vary from 1600-1900 kg/m^3.

Q.17 . Density of no fines concrete with light weight aggregate vary from _____ kg/m^3.
a) 1600-1900
b) <300
c) >2500
d) >300

Answer: b
Explanation: The range of the density of no fines aggregates with the light weight aggregates vary from less than 300 kg/m^3.

Q.18 . The compressive strength of no fines concrete varies between _____
a) 0-5 MPa
b) 4-14 MPa
c) 25 MPa
d) >15 MPa

Answer: b
Explanation: The compressive strength of no fines concrete varies between the ranges of 4MPa to 14 MPa.

Q. 19 . Which of the following are the disadvantages of this concrete?
a) Lightweight
b) Low strength
c) Low shrinkage
d) Good thermal insulating property

Answer: b
Explanation: The main disadvantage of this concrete is that it has very low strength as compared to ordinary Portland cement.

Q. 20 . Which of the following are the advantages of this concrete?
a) Low density
b) Low strength
c) It can't be use in RCC structure
d) Cannot be measured by any available standard methods

Answer: a
Explanation: Due to low density i.e., it is light weight which is good for our construction purpose because it will be easy to transport.

Q. 21 . The range of the density for this concrete is _____
a) >5000 kg/cu. m
b) <6000 kg/cu m
c) 3400-5600 kg/cu m
d) <3400 kg/cu m

Answer: c
Explanation: Test results indicate that high density concrete with densities ranging from 3400 -5600 kg/cu m.

Q.22 . The compressive strength varies from _____
a) < 200 kg/cm^2
b) > 550 kg/cm^2
c) 200-550 kg/cm^2
d) 700 kg/cm^2

Answer: c
Explanation: Compressive strengths varying from 200 -550 kg/sq cm can be produced using steel punchings as coarse aggregate.

Q. 23 . Due to low w/c ratio _____
a) It doesn't cause any problems
b) It causes problems
c) Workability is easy
d) Strength is more

Answer: b
Explanation: Due to low water cement ratio, it causes many problems that's why superplasticizers are used.

Q. 24 . Maximum size of aggregates are used to produce 70MPa compressive strength?
a) 20-30 mm
b) 10-20 mm
c) 30-40 mm
d) 40-50 mm

Answer: a
Explanation: Maximum size of aggregates is 20-30 mm are used to produce 70MPa compressive strength.

Q. 25 . Maximum size of aggregates are used to produce 100MPa compressive strength?
a) 20-30 mm
b) 10-20 mm
c) 30-40 mm
d) 40-50 mm

Answer: b
Explanation: Maximum size of aggregates is 10-20 mm are used to produce 100MPa compressive strength.

Q. 26 . The water–cement ratio is the ratio of _____
a) Weight of water to the weight of cement
b) Volume of water to the volume of cement
c) Density of water to the Density of cement
d) Weight of water to the weight of aggregates

Answer: a
Explanation: The water–cement ratio is the ratio of the weight of water to the weight of cement used in a concrete mix.

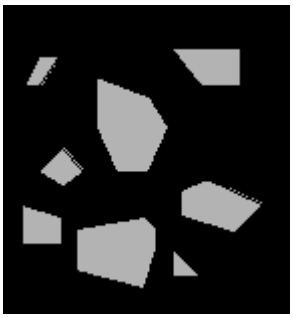
Q. 27 . A lower ratio leads to _____
a) Higher strength and durability
b) Higher strength but low durability
c) Lower strength but high durability
d) Lower strength and durability

Answer: a
Explanation: A lower ratio leads to higher strength and durability, but may make the mix difficult to work with and form.

Q. 28 . Workability can be resolved _____
a) With not using of plasticizers
b) With use of plasticizers
c) With the use of both plasticizers and super plasticizers
d) With not using of both plasticizers and super plasticizers

Answer: c
Explanation: Plasticizers and super plasticizers helps to improve the workability to construct the building.

Q.29 . This image has _____



a) High w/c ratio
b) Low w/c ratio
c) High Strength
d) Low porosity

Answer: a
Explanation: It is clear vision from the image that the amount of water is more as compared to cement.

Q. 30. Which has Low porosity?

A

a) A
b) B
c) Both are same
d) Can't predict

Answer: a
Explanation: Option A figure has low porosity because the content of water is less as compared to cement.

Q. 31 . How to improve the workability of concrete.
a) Increase the w/c ratio
b) Decrease the w/c ratio
c) Decrease the size of aggregates
d) Don't mix it for longer time

Answer: a
Explanation: Increasing the water cement ratio, helps in improving the workability of the concrete.

Q.32 . What is workability?
a) When it is easily placed and compacted heterogeneous
b) When it is easily placed and compacted homogenous
c) When it is not easily placed
d) When it is easily placed but not compacted homogenous

Answer: b
Explanation: Concrete is said to be workable when it is easily placed and compacted homogeneously i.e without bleeding or Segregation.

Q.33 . What is the compaction factor for low degree of workability?
a) .78
b) .85
c) .92
d) .95

Answer: b
Explanation: The compaction factor for low degree of workability is .85 and .95 is the compaction for the high degree .

Q. 34 . Depending on the degree of workability and placing condition determine the _____
a) Slump value
b) The maximum size of aggregate
c) The amount of mixing water
d) The minimum water-cement ratio

Answer: a
Explanation: The slump value is depended on the degree of workability and placing condition.

Q. 35 . Depending on the economical availability and dimensions of the structure determine the _____
a) Slump value
b) The maximum size of aggregate
c) The amount of mixing water
d) The minimum water-cement ratio

Answer: b
Explanation: The value for the maximum size of aggregate depends on the economical availability and dimensions of the structure determine.

Q.36 . For the given slump and maximum size of coarse aggregate determine the _____
a) Slump value
b) The maximum size of aggregate
c) The amount of mixing water
d) The minimum water-cement ratio

Answer: c
Explanation: For the given slump and maximum size of coarse aggregate determine the amount of mixing water.

Q.37 . Determine the _____ either from strength considerations or from durability considerations.
a) Slump value
b) The maximum size of aggregate
c) The amount of mixing water
d) The minimum water-cement ratio

Answer: d
Explanation: Determine the minimum water-cement ratio either from strength considerations or from durability considerations.

Q.38 . Determine the amount of cement per unit volume of concrete from _____
a) Slump value
b) The maximum size of aggregate
c) The amount of mixing water
d) The maximum size of aggregate and the amount of mixing water

Answer: d
Explanation: Determine the amount of cement per unit volume of concrete from the maximum size of aggregate and the amount of mixing water.

Q.39 . This cement content should _____ the cement content required based on durability criteria.
a) Be more than
b) Be equal to
c) Be less than
d) Not be less than

Answer: d
Explanation: This cement content should not be less than the cement content required based on durability criteria.

Q. 40 . The lower the w/c ratio _____ the strength of concrete.
a) Higher
b) Lower
c) Poor
d) Moderate

Answer: a
Explanation: According to ACI mix design, the lower the w/c ratio, higher the strength of concrete.

Q. 41 . The aim of the designer should always be to get concrete mixtures of optimum strength at _____ cement content and _____ workability.
a) Maximum, Nonacceptable
b) Minimum, Nonacceptable
c) Maximum, acceptable
d) Minimum, acceptable

Answer: d
Explanation: The aim of the designer should always be to get concrete mixtures of optimum strength at minimum cement content and acceptable workability.

Q.42. Maximum size of aggregates should not be larger than _____
a) 1/5 the minimum dimension of structural members
b) 1/4 the minimum dimension of structural members
c) 1/3 the minimum dimension of structural members
d) 1/6 the minimum dimension of structural members

Answer: a
Explanation: Maximum size of aggregates should not be larger than 1/5 the minimum dimension of structural members.

Q.43. Maximum size of aggregates should not be larger than _____
a) 1/3 the thickness of a slab
b) 1/2 the thickness of a slab
c) 1/1 the thickness of a slab
d) 1/4 the thickness of a slab

Answer: a
Explanation: Maximum size of aggregates should not be larger than 1/3 the thickness of a slab.

Q.44. The _____ compressive strength required from structural consideration.
a) Nominal
b) Minimum
c) Maximum
d) No

Answer: b
Explanation: Option d can be eliminated easily because we need atleast some compressive strength. The minimum compressive strength required from structural consideration.

Q.45 . The adequate workability necessary for _____ compaction with the compacting equipment available.
a) Half
b) Quarter
c) Full
d) Double

Answer: c
Explanation: Option d can be eliminated easily because double compaction is not possible. The adequate workability necessary for full compaction with the compacting equipment available.

Q.46 . _____ water-cement ratio content to give adequate durability for the particular site conditions.
a) Minimum
b) Nominal
c) .5
d) Maximum

Answer: d
Explanation: Maximum water-cement ratio and/or maximum cement content to give adequate durability for the particular site conditions. It helps to avoid shrinkage cracking due to temp cycle in mass concrete.

Q.47 . _____ cement content to avoid shrinkage cracking due to temperature cycle in mass concrete.
a) Minimum
b) Nominal
c) .5
d) Maximum

Answer: d
Explanation: Maximum cement content to avoid shrinkage cracking due to the temperature cycle in mass concrete. It gives adequate durability for the particular site condition.

Q.48. _____ has designated the concrete mixes into a number of grades as M10, M15.
a) IS 456-2000
b) IS 456-2010
c) IS 513-1999
d) IS 465-2000

Answer: a
Explanation: IS 456-2000 has designated the concrete mixes into a number of grades as M10, M15, M20, M25, M30, M35 and M40.

Q.49 . What is the approx. mix proportion for M10?
a) 1:3:6
b) 1:2:4
c) 1:1.5:3
d) 1:1:2

Answer: a
Explanation: According to IS 456-2000 code, the approximate value of mix proportion for grade M10 is 1:3:6.

Q. 50 . What is the approx. mix proportion for M15?
a) 1:3:6
b) 1:2:4
c) 1:1.5:3
d) 1:1:2

Answer: b
Explanation: According to IS 456-2000 code, the approximate value of mix proportion for grade M15 is 1:2:4.

Q.51 . What is the approx. mix proportion for M20?
a) 1:3:6
b) 1:2:4
c) 1:1.5:3
d) 1:1:2

Answer: c
Explanation: According to IS 456-2000 code, the approximate value of mix proportion for grade M20 is 1:1.5:3.

Q.52 . What is the approx. mix proportion for M25?
a) 1:3:6
b) 1:2:4
c) 1:1.5:3
d) 1:1:2

Answer: d
Explanation: According to IS 456-2000 code, the approximate value of mix proportion for grade M25 is 1:1:2.

Q. 53 . Maximum nominal size of aggregates to be used in concrete may be as large as possible within the limits prescribed by _____
a) IS 456-2000
b) IS 456-2010
c) IS 513-1999
d) IS 465-2000

Answer: a
Explanation: Option can be eliminated because there is no such code. Maximum nominal size of aggregates to be used in concrete may be as large as possible within the limits prescribed by IS 456:2000.

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05 – Quality Control of Concrete	Marks:-14
Content of Chapter:- 5.1. Concreting Operations: Batching. Mixing, Transportation, Placing, Compaction 5.2 Forms for concreting: Different types of form works for beams 5.3 Waterproofing: Importance and need of waterproofing 5.4 Joints in concrete construction: Types of joints.	

Q. 1 The process of rolling, folding and spreading of the particle is known as the _____ of concrete.
a) Curing
b) Mixing
c) Grouting
d) Watering

Answer: b
Explanation: The materials of concrete should be mixed thoroughly so that there is a uniform distribution of materials in the mass of concrete. The thorough mixing also ensures that water cement paste completely covered the surface of aggregate.

Q. 2. For _____ mixing, the materials are stacked on watertight platform, which may be either of wood, Brick or steel.
a) Machine
b) Roller
c) Hand
d) Mixer

Answer: c
Explanation: The mixing by hand is allowed in case of small works on unimportant work were small quantity of concrete is required. For important work, if hand mixing is to be adopted, it is advisable to use 10% more cement than specified.

Q. 3. For _____ mixing, all the material of concrete including water, are collected in a revolving drum and drummer is rotated for a certain period.
a) Drum
b) Hand
c) Roller
d) Machine

Answer: d
Explanation: It is found that the materials of concrete with the help of machine is more efficient and it produces concrete of better quality in a short time. The mixtures of various types and capacities are available in the market. They are may either be of tilting type or non tilting type.

Q. 4. For ordinary building works, the _____ is formed and the concrete is conveyed in pans from hand to hand.
a) Conveyor belt
b) Bucket
c) Human ladder
d) Pump

Answer: c
Explanation: The type of equipment to be used for transport of concrete depends on the nature of work, height above the ground level and the distance between the points of preparation and placing of concrete. For important words, the various mechanical devices such as dumpers, truck mixer, conveyor belts, etc. may be used.

Q. 5. The term _____ of concrete is used to mean the compaction between aggregate and aggregate; between aggregate and reinforcement and between aggregate and forms.
a) Consolidation
b) Hardening
c) Compaction
d) Curing

Answer: a
Explanation: The main aim of consolidation of concrete is to eliminate air Bubbles and thus to give maximum density to the concrete. The importance of consolidation of concrete can be seen from the fact that a presence of 5% of voids reduces 30% strength of concrete.

Q. 6. The _____ are the gaps between two individual particles.
a) Spaces
b) Voids
c) Pores
d) Bubbles

Answer: b
Explanation: The difference between voids and pores may be noted. The pores represent the opening within the individual particles. The process of consolidation of concrete can be carried out either by hand or by means of vibrators.

Q. 7. Form unimportant works, the consolidation of concrete is carried out by _____ method which include Ramming, tamping, spading and slicing with suitable tools.
a) Machine
b) Roller
c) Vibrator
d) Hand

Answer: d
Explanation: The Hand Method require use of a fairly wet concrete. It should however be remembered that wherever feasible, the hand competition should be preferred because the use of vibrator may lead to the segregation of the aggregates.

Q. 8. _____ vibrators consists of the Steel Tube which is inserted in fresh concrete.
a) Surface vibrators
b) Internal vibrators
c) Vibrating table
d) Shutter vibrators

Answer: b
Explanation: The Internal vibrators or Immersion vibrators should be inserted and withdrawn slowly and they should be operated continuously while they are being withdrawn. In this, the Steel Tube is called poker and it is connected to an electric motor or a petrol engine through a flexible tube.

Q. 9. _____ vibrators are mounted on platforms or screeds.
a) Form vibrators
b) Surface vibrators
c) Shutter vibrators
d) Immersion vibrators

Answer: b
Explanation: Surface vibrators are used to finish concrete surface as a bridge floors, roads slabs, station platform, etc. These vibrators are found to be more effective for compacting very dry concrete mixes because the vibration acts in the same direction of gravity and the concrete is compacted in the confined zone.

Q. 10. _____ vibrators are attached to the form work and the external centring of walls, column, etc.
a) Shutter vibrators
b) Surface vibrators
c) Internal vibrators
d) Immersion vibrators

Answer: a
Explanation: In Form or Shutter vibrators, the Vibrating action is conveyed to concrete through the formwork. A considerable energy is absorbed by the formwork during transmission of vibration. Hence they are not generally used.

Q. 11 For walls, columns and vertical faces of all structural members, the form work is generally removed after _____

a) 24 to 48 hours
b) 3 days
c) 7 days
d) 14 days

Answer: a
Explanation: For rapid hardening cement, 3/7 of the above period will be sufficient in all cases except vertical sides of slabs, beams and columns which should be retained for 24 hours.

Q. 12. The basic requirement for the success of any quality control plan is the availability of experienced, knowledgeable and trained personnel at all levels.
a) True
b) False

Answer: a
Explanation: It is the very basic requirement for the success of any quality control plan is the availability of experienced, knowledgeable and trained personnel at all levels.

13. Quality control helps to _____ the risks of overdesign that _____ the overall cost.
a) Maximize, Increase
b) Minimize, Increase
c) Maximize, Decrease
d) Minimize, Decrease

Answer: d
Explanation: Quality control helps to minimize the risks of overdesign that reduces the overall cost.
Note: Join free Sanfoundry classes at Telegram or Youtube.

14. _____ cost of maintenance of the structure _____ construction due to quality works.
a) Maximize, after
b) Minimize, after
c) Maximize, before
d) Minimize, before

Answer: b
Explanation: Minimize the cost of repair and maintenance of the structure after construction due to quality works.

15. It _____ job-site concrete handling, and testing procedures to _____ potential liability to the company.
a) Improve, Increase
b) Improve, Decrease
c) Ruin, Decrease
d) Ruin, Increase
Answer: b
Explanation: It improves job-site concrete handling, curing, sampling and testing procedures to reduce potential liability to the company.

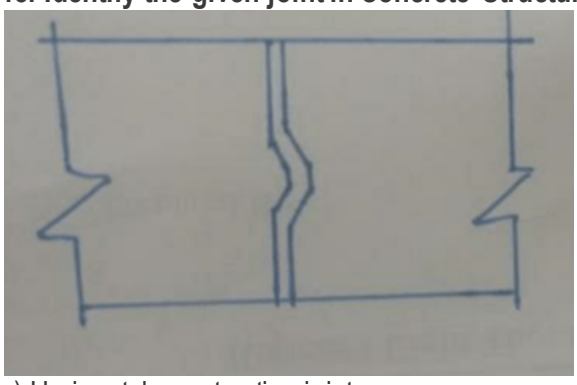
16. _____ quality construction _____ the wastage of materials.
a) Good, reduce
b) Bad, reduce
c) Good, increase
d) Bad, Decrease

Answer: a
Explanation: Good quality construction reduces the wastage of materials, smooth function of the team and keeps the construction cost within the limit.

17. Quality management system improves perception of customers towards company.
a) True
b) False

Answer: a
Explanation: Quality management system improves the perception of customers towards company due to credible quality personnel and quality practices.

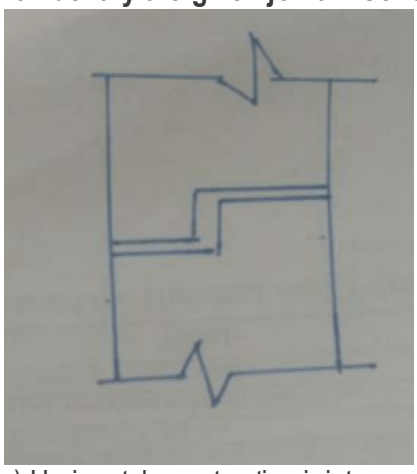
18. Identify the given joint in Concrete Structures.



a) Horizontal construction joint
b) Vertical construction joint
c) Expansion construction joint
d) Water tank joint

Answer: a
Explanation: The construction joints are provided at locations were the construction is stopped either at the end of the day or for any other reason. The provisions of the construction joint become necessary to ensure proper bond between the old work and the new work.

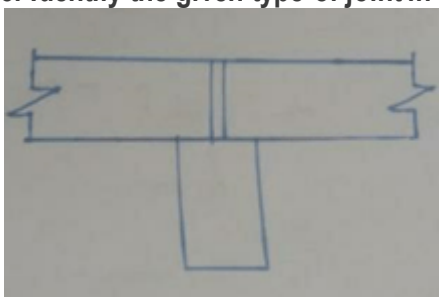
19. Identify the given joint in Concrete Structures.



a) Horizontal construction joint
b) Expansion construction joint
c) Vertical construction joint
d) Water tank joint

Answer: c
Explanation: The construction joint maybe horizontal or vertical. For an inclined or curved member of the joint should be at right angle to the axis of the member. It is necessary to determine the location of construction joints well in advance for the viewpoint of structural stability.

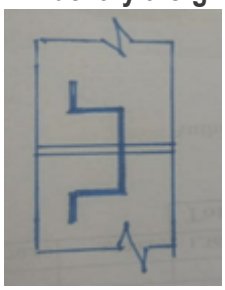
3. Identify the given type of joint in Concrete Structures.



a) L beam construction joint
b) T beam construction joint
c) Expansion joint
d) Contraction Joint

Answer: b
Explanation: In case of T-beams, the ribs should be filled with concrete first and in the slabs forming the flanges can be filled up to the centre of the ribs. If a construction joint between slab and beam becomes unavoidable especially as in the case of long and deep beams, that T beams are used.

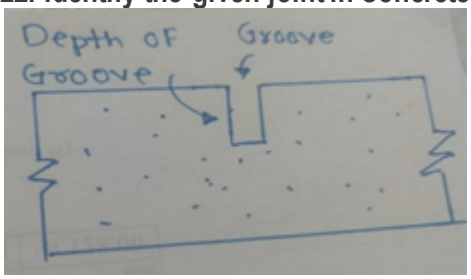
21. Identify the given joint in Concrete Structures.



a) Expansion joint
b) Contraction Joint
c) Water tank joint
d) Vertical construction joint

Answer: c
Explanation: For water tanks and other structured which store water, the strips of copper, aluminium, galvanized iron or other corrosion resistant material known as water stops or waterbars, are placed in construction joint as shown in given figure above.

22. Identify the given joint in Concrete Structures.



a) Partial contraction joint
b) Complete Contraction Joint
c) Horizontal construction joint
d) Dummy joint

Answer: d
Explanation: Above figure shows another form of contraction joint. It is also known as a dummy joint and in this case, a groove of 3 mm width is created in the concrete member to act as a joint. The groove is filled with the joint filler and its depth is about 1/3 to 1/5 of the total thickness of the member.
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23. For water tanks and other structure which store water, the strips of copper, aluminium, galvanized iron or other collision resistance material, known as the _____
a) Joints
b) Waterstops
c) Dowels
d) Fillers

Answer: b
Explanation: The function of waterstops is to seal the joint against the passage of water. The waterstop may also be the natural and synthetic rubber or polyvinyl chloride(PVC).

24. The expansion and contraction joints generally consist of some elastic material, known as _____ which should be compressible, rigid, cellular and Resilient.
a) Keys
b) Joint filler
c) Keys
d) Fillers

Answer: b
Explanation: The usual joint filler are built-in strips of metal, bitumen treated felt, cane fibre board, cork bound with rubber or resin, dehydrated cork, natural cork, softwood free from knots, etc.

25. The _____ are provided in expansion and contraction joints to transfer the load.
a) Dowels
b) Fillers
c) Joint filler
d) Waterbars

Answer: a
Explanation: The contraction joints are installed to allow for shrinkage movement in the structure. It may either be a complete contraction joint or a partial construction joint. In the former case, there is complete discontinuity of both concrete and steel.

26. The _____ is the most effective process of repairing concrete work which has been damaged due to inferior work or other reasons.
a) Grouting
b) Scraping
c) Dewatering
d) Guniting

Answer: d
Explanation: In Guniting, the surface to be treated is cleaned and washed. The nozzle is generally kept at a distance of about 750 mm to 850 mm from the surface to be treated and velocity of nozzle values from 120 m/sec to 160 m/sec.

27. The _____ is a mixture of cement and sand, the usual proportion being 1:3.
a) Mortar
b) Slurry
c) Gunite
d) Concrete

Answer: c
Explanation: A cement gun is used to deposit the Gunite mixture on the concrete surface under pressure of about 20 N/cm^2 to 30 N/cm^2. The cement is mixed with slightly moist sand and the necessary water is added as the mixture comes out from the cement gun.

28. The concrete is contained in a timber or steel casing for a certain period after its placing, this casing is known as the _____
a) Tremie
b) Hopper
c) Shuttering
d) Grouting

Answer: c
Explanation: The shuttering, formwork or moulds is to be removed when concrete has Harden sufficiently to support its own weight. The formwork should be designed in such a way that it can be easily removed and used again.

28. A _____ consists of a watertight pipe of diameter about 250 mm to 300 mm.
a) Hopper
b) Grout
c) Bucket
d) Tremie

Answer: d
Explanation: The pipe extends from the level of working platform to the lowest point where concrete is to be deposited. The bottom of the Tremie is provided with the concrete block which is forced out when concrete starts.

29. A _____ is provided at the top of the Tremie to receive the concrete.
a) Bucket
b) Hopper
c) Tremie
d) Pipe

Answer: b
Explanation: It is necessary to keep the bottom end of the Tremie sufficiently deep in the fresh concrete so as to prevent the entry of water in the Tremie. A Hopper is provided at the top to receive the concrete which goes through the Tremie into the water.

30. _____ method is not in common use in case of placing concrete underwater.
a) Tremie
b) Grouting
c) Guniting
d) Spreading

Answer: a
Explanation: Tremie Method consist of spreading course aggregate underwater and then the salary of cement and sand its food through the pipe so as to replace the water in the voids of the coarse aggregate.

31. The _____ is the most effective process of repairing concrete work which has been damaged due to enquiry work or other reasons.
a) Grouting
b) Guniting
c) Vibrating
d) Pouring

Answer: b
Explanation: In Guniting method, the surface to be treated is cleaned and washed, the nozzle of gun is generally kept at a distance of about 750 mm to 850 mm from the surface to be treated and the velocity of nozzle varies from 120 m/sec to 160 m/sec.

32. The _____ is a mixture of cement and sand, the usual proposition being 1:3.
a) Grout
b) Mortar
c) Slurry
d) Gunite

Answer: d
Explanation: A cement gun is used to deposit the Gunite on the concrete surface under a pressure off about 22 N/cm2 to 30 N/cm2. The cement is mixed with slightly moist sand and the necessary water is added as the mixture comes out from the cement gun.

33. It is observed that in cold weather, the curing is _____ in the initial stages of the setting of concrete.
a) Moderate
b) Slow
c) High
d) Fast

Answer: b
Explanation: The slow curing of concrete results in higher ultimate strength. The concrete should be cured adequately especially when humidity is low and heat is used to control the temperature.

34. While placing concrete in hot weather, the aggregate should be _____ to bring down the temperature of concrete.
a) Burnt
b) Pre cooled
c) Heated
d) Washed

Answer: b
Explanation: In summer, the usual mistake made while placing concrete is the addition of extra water to the mixture as well as the finish concrete surface. Such an extra water resistance the strength and other properties of concrete.

35. In cold weather conditions, the temperature of concrete should not be allowed to fall below _____ for at least 3 days after its placing.
a) 5° C
b) 25°C
c) 15°C
d) 50°C

Answer: c
Explanation: At the time of placing, the temperature of concrete should be between 15° Celsius to 25° Celsius and it should not be allowed to come into contact with water having a temperature of 35° Celsius.

36. The _____ are open at top and their bottoms are provided with openable doors.
a) Tremie
b) Hopper
c) Buckets
d) Bevel

Answer: c
Explanation: The concrete is put up in the bucket and it is covered by means of Canvas to protect it from water when bucket is being lowered point. When bucket reaches the desired depth, the bottom doors are opened out and concrete is allowed to drop slowly.

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06 – Chemical Admixture in concrete Special Concrete and Extreme weather concreting	Marks:-10
Content of Chapter:- 6.1. Admixture in concrete: Purpose, properties and application 6.2 Special Concrete: Properties, advantages 6.3 Cold and Hot weather concreting: Effect of cold and Hot weather on concrete 6.4 Concrete as industrial flooring material and various techniques:	

Q. 1 Concrete is not recommended to be placed at a temperature above _____ ^{o}C.
a) 20
b) 30
c) 40
d) 50

Answer: c
Explanation: Any operation of concreting done at atmospheric temperature above 40 ^{o}C may be put under hot weather concreting.

Q. 2. IS: 7861 part-1 deals with _____
a) Hot weathering concrete
b) Cold weathering concrete
c) Air entertained concrete
d) OPC

Answer: a
Explanation: IS: 7861 part-1 deals with hot weather concreting and Part-2 deals with cold weather concreting.

Q. 3. A higher temperature of fresh concrete results in a _____ hydration of cement.
a) More rapid
b) Rapid
c) Low
d) Very low

Answer: a
Explanation: A higher temperature of fresh concrete results in a more rapid hydration of cement and leads to reduced workability/ accelerated setting.

Q. 4. Does this reduce handling time?
a) True
b) False

Answer: a
Explanation: A higher temperature of fresh concrete results in a more rapid hydration of cement and leads to reduced workability/ accelerated setting. This reduces the handling time of concrete.

Q. 5. Rapid evaporation may cause plastic shrinkage _____
a) Elastic shrinkage
b) Plastic shrinkage
c) High workability
d) Good strength

Answer: b
Explanation: Rapid evaporation may cause plastic shrinkage and cracking and subsequent cooling of hardened concrete would introduce tensile stresses.

Q. 6. It is difficult to retain moisture for hydration for RAPID EVAPORATION OF WATER DURING CURING PERIOD.
a) True
b) False

Answer: a
Explanation: It is difficult to retain moisture for hydration and maintain reasonably uniform temperature conditions during the curing period.

Q. 7. Prepacked concrete _____ water proofing concrete.
a) Is
b) Is not
c) May be
d) Is but depends on temperature

Answer: a
Explanation: Prepacked concrete is water proofing concrete with quality plaster which prevents water seepage.

Q. 8. Cement has _____ % volumetric shrinkage after curing.
a) 5
b) 6
c) 7
d) 8

Answer: a
Explanation: Option a is the correct one because cement has 3-5% volumetric shrinkage after curing.

Q. 9. After vacuum mixing, the volumetric shrinkage can be raised from 3–5% to _____ % in different cements.
a) 1-2
b) 3-5
c) 5-7
d) 6-8

Answer: c
Explanation: The volumetric shrinkage can be raised from 3–5 % to 5-7 % in different cements after mixing vacuum into it.

Q. 10. Vacuum mixing systems reduce the exposure by _____ %.
a) 20
b) 40
c) 50
d) 10

Answer: c
Explanation: Vacuum mixing system decreases the exposure by 50 % to 70% and eliminates the contact with the bone cement while delivery.

Q. 11. The exposure of conventional mixing in open bowl is about _____ ppm in the breathing zone.
a) 20
b) 40
c) 50
d) 10

Answer: d
Explanation: 10 ppm is the exposure value of conventional mixing in open bowl in the breathing zone. And the exposure limit lies in the range of 50-100 ppm in Europe.

Q.12 . The moisture content of the aggregate shall not exceed from _____
a) .1% – .5%
b) 1% – 55
c) 10% – 50%
d) 15%

Answer: a
Explanation: It was recommend by the scientist later on that the moisture content of the aggregates shall not exceed from .1% to .5%.

Q.13 . Which one is not the polymeric resin?
a) Polyester resin
b) Epoxy resin
c) Vinyl ester resin
d) Sulphates

Answer: d
Explanation: Polymeric resins that are commonly used in polymer concrete are methacrylate, polyester resin, epoxy resin, vinyl ester resin, and furan resins.

Q.13 . Higher resin dosage is recommended when using _____
a) Coarse aggregate
b) Fine aggregates
c) All in one aggregates
d) More cement

Answer: b
Explanation: Higher resin dosage is recommended when using fine aggregate, because of the presence of the large surface area of the materials.

Q. 14. Steel fibers helps in the enhancement of its properties.
a) True
b) False

Answer: a
Explanation: Steel fibers, glass fibers, carbon fibers, and polyester fibers have been added to in PIC for enhancement of its properties.

Q. 15. The addition of glass fibers are in the range of _____
a) 0-6%
b) 10%
c) 15-20%
d) 20%-25%

Answer: a
Explanation: Most of the studies have reported the addition of glass fibers are in the range of 0-6% in PIC.

Q. 16. Concrete is not recommended to be placed at a temperature below _____^{o}C.
a) 2
b) 3
c) 4
d) 5

Answer: d
Explanation: Any concreting operation done at a temperature below 5°C is termed as cold weather concreting.

Q. 17. IS: 7861 part-2 deals with _____
a) Hot weathering concrete
b) Cold weathering concrete
c) Air entertained concrete
d) OPC

Answer: b
Explanation: IS: 7861 part-1 deals with hot weather concreting and Part-2 deals with cold weather concreting.

Q. 18. Why the time period for removal of form work has to be increased.
a) The development of strength of concrete is retarded compared with development at normal temperature
b) The development of strength of concrete is accelerate compared with development at normal temp erature
c) The development of strength of concrete is advanced compared with development at normal temperature
d) The development of strength of concrete is precocious compared with de velopment at normal temperature

Answer: a
Explanation: When the temperature is falling to about 50C or below, the development of strength of concrete is retarded compared with development at normal temperature. Thus, the time period for removal of form work has to be increased.

Q. 19. If concrete is exposed to repeated freezing and thawing after the final set, the final qualities of the concrete may also be _____
a) Impair
b) Aid
c) Improve
d) Extend

Answer: a
Explanation: If concrete is exposed to repeated freezing and thawing after the final set and during the hardening period, the final qualities of the concrete may also be impaired.

Q. 20. Large temperature differentials within the concrete member may promote _____
a) Elastic shrinkage
b) Cracking
c) High workability
d) Good strength

Answer: b
Explanation: Large temperature differentials within the concrete member may promote cracking and affect its durability adversely.

Q. 21. When the concrete in fresh stage is exposed to freeze before certain pre-hardening period, compressive strength may get _____
a) Increased to 50%
b) Decreased to 50%
c) Increased to 25%
d) Decreased to 25%

Answer: b
Explanation: When the concrete in fresh stage is exposed to freeze before a certain prehardening period, concrete may suffer loss in its prop. to an extent that compressive strength may get decreased to 50%.

Q. 22. What is curing?
a) Dehydration
b) Hydration
c) Drying
d) Dipping

Answer: b
Explanation: Curing refers to hydration, the chemical process by which concrete hardens once it is poured.

Q.23 . In a dry environment, concrete strength will be loosed as much as _____ % in the moist environment.
a) 30
b) 40
c) 50
d) 60

Answer: c
Explanation: Laboratory tests show that concrete strength will be loosed as much as 50% in dry environment as compared to moist environment.

Q.24 . Concrete placed in cold weather will take _____ time to gain strength.
a) No
b) Less
c) More
d) Equal to hot weather

Answer: c
Explanation: Concrete placed in cold weather will take longer time to gain strength, delaying form removal and subsequent construction.

Q.25 . After finishing concrete surface must be kept _____
a) Dry
b) First dry it and then wet it
c) First wet it and then dry it
d) Wet

Answer: d
Explanation: After finishing concrete surface must be kept wet, so that it'd be prevented from evaporation.

Q.26 . Dry intervals in surface wetting leads to _____
a) Cracking
b) Fogging
c) High strength
d) Good workability

Answer: a
Explanation: Dry intervals or patches can lead to crazing or cracking on the slab surface.

Q.27 . Contractors place blankets over the concrete to _____
a) Increase the rate of evaporation
b) Slow the rate of evaporation
c) To increase the strength
d) Ease to do work

Answer: b
Explanation: A more common practice is for contractors to place blankets over the slab surface to slow the rate of evaporation.

Q.28 . Well cured concrete _____ thermal, plastic & drying shrinkage cracks.
a) Doesn't affect
b) Maximize
c) Minimize
d) Create

Answer: c
Explanation: Well cured concrete can minimize thermal, plastic & drying shrinkage cracks, making concrete more water tight, thus preventing moisture and water borne chemicals from entering into the concrete.

Q.29 . Which method is the most common and cheaper for water curing?
a) Ponding
b) Sprinkling
c) Mist curing
d) Wet covering

Answer: a
Explanation: Ponding is the most common and inexpensive method of curing flat surfaces such as floor slabs, flat roofs, pavements and other horizontal surfaces.

Q.30 . The hydration that provides the initial mix and chemical bond of the concrete's ingredients is the _____
a) First step
b) Second step
c) Third step
d) Fourth step

Answer: a
Explanation: The hydration that provides the initial mix and chemical bond of the concrete's ingredients is the first step, but in order for the slab to be properly prepared for its final finish or flooring.

Q. 31 . What is the full form of rH?
a) Rhesus factor
b) Relative humidity
c) Rush hour
d) Radio head

Answer: b
Explanation: Relative Humidity (RH) is the ratio of the amount of water vapor in the air at a specific temperature to the maximum amount that the air could hold at that temperature.

Q.32 . What C31 test under the Standard ASTM test method?
a) Test Method for Making and Curing Concrete Test Specimens in the Field
b) Test Method for Compressive Strength of Cylindrical Specimen
c) Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
d) Test Method for Slump of Hydraulic Cement Concrete

Answer: a
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C31 test is for Test Method for Making and Curing Concrete Test Specimens in the Field.

Q.33 . What C39 test under the Standard ASTM test method?
a) Test Method for Making and Curing Concrete Test Specimens in the Field
b) Test Method for Compressive Strength of Cylindrical Specimen
c) Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
d) Test Method for Slump of Hydraulic Cement Concrete

Answer: b
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C39 test is for Test Method for Compressive Strength of Cylindrical Specimen.

Q. 34 . What C138 test under the Standard ASTM test method?
a) Test Method for Making and Curing Concrete Test Specimens in the Field
b) Test Method for Compressive Strength of Cylindrical Specimen
c) Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
d) Test Method for Slump of Hydraulic Cement Concrete

Answer: c
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C138 test is for Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.

Q.35 . What C143 test under the Standard ASTM test method?
a) Test Method for Making and Curing Concrete Test Specimens in the Field
b) Test Method for Compressive Strength of Cylindrical Specimen
c) Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
d) Test Method for Slump of Hydraulic Cement Concrete

Answer: d
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C143 test is for Test Method for Slump of Hydraulic Cement Concrete.

Q.36 . What C172 test under the Standard ASTM test method?
a) Test Method for Sampling Freshly Mixed Concrete
b) Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
c) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
d) Test Method for Temperature of Freshly Mixed Portland-Cement Concrete

Answer: a
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C172 test is for Test Method for Sampling Freshly Mixed Concrete.

Q.37 . What C173 test under the Standard ASTM test method?
a) Test Method for Sampling Freshly Mixed Concrete
b) Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
c) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
d) Test Method for Temperature of Freshly Mixed Portland-Cement Concrete

Answer: b
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C173 test is for Air Content of Freshly Mixed Concrete by the Volumetric Method.

Q.38 . What C 231 test under the Standard ASTM test method?
a) Test Method for Sampling Freshly Mixed Concrete
b) Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
c) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
d) Test Method for Temperature of Freshly Mixed Portland-Cement Concrete

Answer: c
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C231 test is for Air Content of Freshly Mixed Concrete by the Pressure Method.

Q.39 . What C 1064 test under the Standard ASTM test method?
a) Test Method for Sampling Freshly Mixed Concrete
b) Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
c) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
d) Test Method for Temperature of Freshly Mixed Portland-Cement Concrete

Answer: d
Explanation: According to Standard ASTM test methods to evaluate field-placed concrete C1064 test is for Temperature of Freshly Mixed Portland-Cement Concrete.

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