Registration form

Basic Concrete CEU Course $50.00

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Start and Finish Dates:_____ *You will have 90 days from this date in order to complete this course*

Name_____**Signature**_____
I have read and understood the disclaimer notice on page 2. Digitally sign XXX

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I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

Grading Information
In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity. Thank you…

Basic Concrete Course Answer Key

Name_____

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Please write down any questions that cannot be found or has problems

Please circle, underline, bold or X only one correct answer
A felt tipped pen works best.

1. A B C D	12. A B C D	23. A B C D	34. A B C D
2. A B C D	13. A B C D	24. A B C D	35. A B C D
3. A B C D	14. A B C D	25. A B C D	36. A B C D
4. A B C D	15. A B C D	26. A B C D	37. A B C D
5. A B C D	16. A B C D	27. A B C D	38. A B C D
6. A B C D	17. A B C D	28. A B C D	39. A B C D
7. A B C D	18. A B C D	29. A B C D	40. A B C D
8. A B C D	19. A B C D	30. A B C D	41. A B C D
9. A B C D	20. A B	31. A B C D	42. A B C D
10. A B C D	21. A B C D	32. A B C D	43. A B C D
11. A B C D	22. A B C D	33. A B C D	44. A B C D

45. A B C D	59. A B C D	73. A B C D	87. A B C D
46. A B C D	60. A B C D	74. A B C D	88. A B C D
47. A B C D	61. A B C D	75. A B C D	89. A B C D
48. A B C D	62. A B C D	76. A B C D	90. A B C D
49. A B C D	63. A B C D	77. A B C D	91. A B C D
50. A B C D	64. A B C D	78. A B C D	92. A B C D
51. A B C D	65. A B C D	79. A B C D	93. A B C D
52. A B C D	66. A B C D	80. A B C D	94. A B C D
53. A B C D	67. A B	81. A B C D	95. A B C D
54. A B C D	68. A B C D	82. A B C D	96. A B C D
55. A B C D	69. A B C D	83. A B C D	97. A B C D
56. A B C D	70. A B C D	84. A B C D	98. A B C D
57. A B C D	71. A B C D	85. A B C D	99. A B C D
58. A B C D	72. A B C D	86. A B C D	100. A B C D

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Please e-mail or fax this survey with your final exam

BASIC CONCRETE CEU COURSE
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PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.

1. Please rate the difficulty of your course.
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If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of $50.00. This fee may not cover postage costs. If you need this service, simply write RUSH on the top of your Registration Form. We will place you in the front of the grading and processing line.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity. Thank you…

Basic Concrete Training Course Assignment

You will have 90 days in order to successfully complete this assignment with a score of 70% or better. If you need any assistance, please contact TLC's Student Services. Once you are finished, please, e-mail or fax or e-mail your answer sheet along with your registration form.

Please use the Answer Key and Registration form. Select the exact answer from text.
Legend (s) means the answer is either singular or plural.

Be careful and examine the "Or" answers too.

What is Concrete?

1. Concrete is a _____made-up mainly of water, aggregate, and cement.
A. Rock-like substance C. Hard matrix
B. Composite material D. None of the above

2. Over time, the cement forms a _____ that binds the rest of the ingredients together into a durable stone-like material with many uses.
A. Rock-like substance C. Hard matrix
B. Cement D. None of the above

Modern Concrete Additives

3. In modern times, researchers have experimented with the adding of other materials to create concrete with improved properties, such as_____, electrical conductivity, or resistance to damages through spillage.
A. Rock-like substance C. Steel, wood, plastics, and aluminum
B. Higher strength D. None of the above

Modern Concrete Use

4. Concrete is used in massive quantities almost everywhere humankind has a need for_____.
A. Cement C. Infrastructure
B. Concrete D. None of the above

5. The amount of concrete used worldwide, ton for ton, is twice that of steel, wood, plastics, and aluminum combined.
A. Ten times C. Half
B. Twice D. None of the above

6. Concrete's use in the modern world is exceeded only by that of naturally occurring _____.
A. Sand and rock C. Finely ground raw material
B. Water D. None of the above

Portland Cement

7. Concrete is formed when Portland cement creates a paste with water that binds with _____ to harden.
A. Sand and rock C. Finely ground raw material
B. Water D. None of the above

8. Cement is manufactured through a closely controlled chemical combination of calcium, silicon, _____, iron and other ingredients .

A. Sand and rock C. Aluminum
B. Blast furnace slag D. None of the above

9. Common materials used to manufacture cement include limestone, shells, and chalk or marl combined with shale, clay, slate, blast furnace slag, silica sand, and iron ore.

A. Sand and rock C. Aluminum
B. Blast furnace slag D. None of the above

10. Cement plant laboratories inspect each step in the manufacture of _____by frequent chemical and physical tests.

A. Principal raw materials C. Portland cement
B. All industry specifications D. None of the above

11. The first step is to quarry the_____, mainly limestone, clay, and other materials. After quarrying the rock is crushed. This involves several stages. The first crushing reduces the rock to a maximum size of about 6 inches.

A. Principal raw materials C. Portland cement
B. All industry specifications D. None of the above

12. The _____is combined with other ingredients such as iron ore or fly ash and ground, mixed, and fed to a cement kiln.

A. Crushed rock C. Aluminum
B. Blast furnace slag D. None of the above

13. _____ or the slurry is fed into the higher end. At the lower end is a roaring blast of flame, produced by precisely controlled burning of powdered coal, oil, alternative fuels, or gas under forced draft.

A. Clinker C. The finely ground raw material
B. Concrete D. None of the above

14. As the material moves through the kiln, certain elements are driven off in the form of gases. The remaining elements unite to form a new substance called _____.

A. Clinker C. The finely ground raw material
B. Concrete D. None of the above

15. Clinker comes out of the kiln as grey balls, about the size of_____.

A. Gypsum and limestone C. Finely ground raw material
B. Marbles D. None of the above

16. _____ is discharged red-hot from the lower end of the kiln and generally is brought down to handling temperature in various types of coolers.

A. Clinker C. The finely ground raw material
B. Concrete D. None of the above

17. After the clinker is cooled, cement plants grind it and mix it with small amounts of_____ . Cement is so fine that 1 pound of cement contains 150 billion grains.
A. Gypsum and limestone C. Finely ground raw material
B. Marbles D. None of the above

18. The _____ is now ready for transport to ready-mix concrete companies to be used in a variety of construction projects.
A. Limestone C. Cement
B. Wet process D. None of the above

19. Although the dry process is the most modern and popular way to manufacture cement, some kilns in the United States use a wet process. The two processes are essentially alike except in the wet process, the _____are ground with water before being fed into the kiln.
A. Clinker C. Raw material(s)
B. Limestone D. None of the above

Composition of Concrete
20. There are many types of concrete available, created by varying the proportions of the main ingredients. In this way or by substitution for the cementitious and aggregate phases, the finished product can be tailored to its application with varying strength, density, or chemical and thermal resistance properties.
A. True B. False

21. "_____ " consists of large chunks of material in a concrete mix, generally coarse gravel or crushed rocks such as limestone, or granite, along with finer materials such as sand.
A. Mix design C. Aggregate
B. Concrete D. None of the above

22. "_____", most commonly Portland cement is associated with the general term "concrete."
A. Cement C. Fly ash
B. Dry composite D. None of the above

23. Other cementitious materials such as fly ash and _____are sometimes added to Portland cement and become a part of the binder for the aggregate.
A. Cement C. Slag cement
B. Dry composite D. None of the above

24. Water is then mixed with this_____, which produces a semi-liquid that workers can shape (typically by pouring it into a form).
A. Cement C. Fly ash
B. Dry composite D. None of the above

25. The concrete solidifies and hardens through a chemical process called hydration. The water reacts with the cement, which bonds the other components together, creating_____.
A. Mix design C. A robust stone-like material
B. Fly ash D. None of the above

26. "_____" are added to achieve varied properties. These ingredients may speed or slow down the rate at which the concrete hardens, and impart many other useful properties including increased tensile strength and water resistance.
A. Portland cement C. Chemical admixture(s)
B. Chemical mixtures D. None of the above

27. "Reinforcements" are often added to _____.
A. Mix design C. Hydration
B. Binder for the aggregate D. None of the above

28. _____can be formulated with high compressive strength, but always has lower tensile strength. For this reason it is usually reinforced with materials that are strong in tension (often steel).
A. Fly ash C. Binder for the aggregate
B. Concrete D. None of the above

29. "_____" are becoming more popular in recent decades.
A. Mineral admixtures C. Reinforcement(s)
B. Thermal resistance D. None of the above

30. The most conspicuous of these are fly ash, a by-product of coal-fired power plants, and silica fume, a byproduct of industrial electric arc furnaces. The use of these materials in concrete reduces the amount of resources required, as the _____act as a cement replacement.
A. Cement C. Mix design
B. Ash and fume D. None of the above

31. This displaces some _____production, an energetically expensive and environmentally problematic process, while reducing the amount of industrial waste that must be disposed of.
A. Cement C. Mix design
B. Ash and fume D. None of the above

32. The _____ depends on the type of structure being built, how the concrete is mixed and delivered, and how it is placed to form the structure.
A. Cement C. Mix design
B. Ash and fume D. None of the above

Water
33. Combining water with a _____forms a cement paste by the process of hydration. The cement paste glues the aggregate together, fills voids within it, and makes it flow more freely.
A. Cementitious material C. Cement paste
B. Concrete mixture(s) D. None of the above

34. A lower water-to-cement ratio yields a stronger, more durable concrete, whereas more water gives a freer-flowing concrete with a_____.
A. Higher slump C. Cement paste
B. Concrete mixture(s) D. None of the above

35. Hydration involves many different reactions, often occurring at the same time. As the reactions proceed, the products of the cement hydration process gradually bond together the individual sand and gravel particles and other components of the concrete to form _____.
A. A solid mass C. Reinforced concrete
B. Strength gradients D. None of the above

Aggregates
36. _____make up the bulk of a concrete mixture. Sand, natural gravel, and crushed stone are used mainly for this purpose.
A. Fine and coarse aggregates C. Composite material
B. Exposed aggregate(s) D. None of the above

37. _____(from construction, demolition, and excavation waste) are increasingly used as partial replacements of natural aggregates, while a number of manufactured aggregates, including air-cooled blast furnace slag and bottom ash are also permitted.
A. Aggregate(s) C. Cementitious material
B. Recycled aggregates D. None of the above

38. The presence of _____greatly increases the durability of concrete above that of cement, which is a brittle material in its pure state. Thus concrete is a true composite material.
A. Chemical admixture(s) C. Aggregate
B. Exposed aggregate(s) D. None of the above

39. Redistribution of _____ after compaction often creates inhomogeneity due to the influence of vibration. This can lead to strength gradients.
A. Aggregate(s) C. Cementitious material
B. Strength gradients D. None of the above

40. Decorative stones such as quartzite, small river stones or crushed glass are sometimes added to the surface of concrete for a decorative "_____" finish, popular among landscape designers.
A. Exposed aggregate(s) C. Cement paste
B. Concrete mixture(s) D. None of the above

Reinforcement
41. Concrete is strong in compression, as the _____efficiently carries the compression load. However, it is weak in tension as the cement holding the aggregate in place can crack, allowing the structure to fail.
A. Aggregate(s) C. Cementitious material
B. Reinforced concrete D. None of the above

Chemical Admixtures

42. Chemical admixture(s) are materials in the form of powder or fluids that are added to the concrete to give it certain characteristics not obtainable with plain concrete mixes. In normal use, admixture dosages are less than _____% by mass of cement and are added to the concrete at the time of batching/mixing.

A. 20 C. 10
B. 5 D. None of the above

43. Accelerating _____are especially useful for modifying the properties of concrete in cold weather.

A. Retarders C. Admixtures
B. Defoamer(s) D. None of the above

44. _____slow the hydration of concrete and are used in large or difficult pours where partial setting before the pour is complete is undesirable.

A. Retarders C. Admixtures
B. Defoamer(s) D. None of the above

45. If too much air becomes trapped in the concrete as a result of the mixing process, _____can be used to encourage the air bubble to agglomerate, rise to the surface of the wet concrete and then disperse.

A. Retarders C. Admixtures
B. Defoamer(s) D. None of the above

46. _____ increase the workability of plastic or "fresh" concrete, allowing it be placed more easily, with less consolidating effort.

A. Bonding agent(s) C. Portland cement (blended cements)
B. Plasticizer(s) D. None of the above

47. _____ can be used to reduce the water content of a concrete while maintaining workability and are sometimes called water-reducers due to this use. Such treatment improves its strength and durability characteristics.

A. Bonding agent(s) C. Portland cement (blended cements)
B. Plasticizer(s) D. None of the above

48. _____ are a class of plasticizers that have fewer deleterious effects and can be used to increase workability more than is practical with traditional plasticizers.

A. Air entrainment(s) C. Superplasticizer(s)
B. Accelerating admixture(s) D. None of the above

49. _____include sulfonated naphthalene formaldehyde condensate, sulfonated melamine formaldehyde condensate, acetone formaldehyde condensate and polycarboxylate ethers.

A. Superplasticizer(s) C. Compounds used as superplasticizers
B. Plasticizer(s) D. None of the above

50. _____are used to minimize the corrosion of steel and steel bars in concrete.

A. Accelerating admixture(s) C. Corrosion inhibitor(s)
B. Defoamer(s) D. None of the above

51. _____ are used to create a bond between old and new concrete.
A. Bonding agent(s) C. Portland cement (blended cements)
B. Plasticizer(s) D. None of the above

52. _____improve pumpability, thicken the paste and reduce separation and bleeding.
A. Accelerating admixture(s) C. Corrosion inhibitor(s)
B. Pumping aids D. None of the above

Mineral Admixtures and Blended Cements
53. _____that have pozzolanic or latent hydraulic properties, these very fine-grained materials are added to the concrete mix to improve the properties of concrete, or as a replacement for Portland cement.
A. Bonding agent(s) C. Inorganic materials
B. Plasticizer(s) D. None of the above

54. Products which incorporate limestone, fly ash, blast furnace slag, and other useful materials with _____into the mix, are being tested and used.
A. Pozzolanic properties C. Latent hydraulic properties
B. Plasticizer(s) D. None of the above

55. This development is due to _____ production being one of the largest producers (at about 5 to 10%) of global greenhouse gas emissions, as well as lowering costs, improving concrete properties, and recycling wastes.
A. Accelerating admixture(s) C. Cement
B. Defoamer(s) D. None of the above

56. Which of the following is a by-product of coal-fired electric generating plants; it is used to partially replace Portland cement ?
A. Water C. Fly ash
B. Superplasticizer(s) D. None of the above

57. The properties of Fly ash depend on the type of coal burnt. In general, siliceous fly ash is pozzolanic, while calcareous fly ash has _____properties.
A. Concrete production C. Latent hydraulic
C. Superplasticizer(s) D. None of the above

58. Ground granulated blast furnace slag (GGBFS or GGBS): A by-product of steel production is used to partially replace _____(by up to 80% by mass). It has latent hydraulic properties.
A. Concrete C. Cement
B. Portland cement D. None of the above

59. _____is used to increase strength and durability of concrete, but generally requires the use of superplasticizers for workability.
A. Concrete production C. Addition of various additives
B. Silica fume D. None of the above

60. High reactivity Metakaolin (HRM): Metakaolin produces concrete with strength and durability similar to concrete made with _____.
A. Silica fume C. Aggregate
B. Reactive ingredient(s) D. None of the above

Concrete Production

61. _____production is time-sensitive.
A. Concrete C. Addition of various additives
B. Superplasticizer(s) D. None of the above

62. In modern usage, most _____ production takes place in a large type of industrial facility called a concrete plant, or often a batch plant.
A. Concrete C. Cement
B. Aggregate D. None of the above

63. A ready mix plant mixes all the ingredients except water, while a central mix plant mixes all the ingredients including _____.
A. Water C. Aggregate
B. Superplasticizer(s) D. None of the above

64. A central mix plant offers more accurate control of the _____ quality through better measurements of the amount of water added, but must be placed closer to the work site where the concrete will be used, since hydration begins at the plant.
A. Concrete C. Cement
B. Reactive ingredient(s) D. None of the above

65. A concrete plant consists of large storage hoppers for various reactive ingredients like cement, storage for bulk ingredients like_____, mechanisms for the addition of various additives and amendments, machinery to accurately weigh, move, and mix some or all of those ingredients, and facilities to dispense the mixed concrete, often to a concrete mixer truck.
A. Concrete production C. Addition of various additives
B. Aggregate and water D. None of the above

66. _____is usually prepared as a viscous fluid, so that it may be poured into forms, which are containers erected in the field to give the concrete its desired shape..
A. Modern concrete C. Cement
B. Reactive ingredient(s) D. None of the above

67. There is a wide variety of equipment for processing concrete, from hand tools to heavy industrial machinery. Whichever equipment builders' use, however, the objective is to produce the desired building material; ingredients must be properly mixed, placed, shaped, and retained within time constraints. Once the mix is where it should be, the curing process must be controlled to ensure that the Concrete attains the desired attributes. During concrete preparation, various technical details may affect the quality and nature of the product.
A. True B. False

More on Portland Cement

68. When initially mixed, Portland cement and water rapidly form a gel of tangled chains of interlocking crystals, and _____continue to react over time. Initially the gel is fluid, which improves workability and aids in placement of the material, but as the concrete sets, the chains of crystals join into a rigid structure, counteracting the fluidity of the gel and fixing the particles of aggregate in place.

A. Separate paste mixing C. Components of the gel
B. Volumetric stability D. None of the above

69. During curing, the cement continues to react with the residual water in a process of hydration. In properly formulated concrete, once this curing process has terminated the product has the desired physical and_____.

A. Residual water C. Chemical properties
B. Premixed paste D. None of the above

70. Among the qualities typically desired, are mechanical strength, low moisture permeability, and chemical and_____.

A. HEM Nano concrete C. Quasi-laminar flow of the mixture
B. Volumetric stability D. None of the above

Mixing Concrete

71. Thorough mixing is essential for the production of _____.

A. Paste C. Uniform, high-quality concrete
B. Premixed paste D. None of the above

72. Separate _____ mixing has shown that the mixing of cement and water into a paste before combining these materials with aggregates can increase the compressive strength of the resulting concrete.

A. Paste C. Uniform, high-quality concrete
B. Premixed paste D. None of the above

73. _____ may include admixtures such as accelerators or retarders, superplasticizers, pigments, or silica fume. The premixed paste is then blended with aggregates and any remaining batch water and final mixing is completed in conventional concrete mixing equipment.

A. Uniform mixture(s) C. Cement hydration
B. The cement paste premix D. None of the above

Nano Concrete

74. Is created by_____ , sand and water using a specific consumed power of 30 - 600 watt/kg for a net specific energy consumption of at least 5 kJ/kg of the mix.

A. HEM Nano concrete C. High-energy mixing (HEM) of cement
B. Volumetric stability D. None of the above

75. In the _____sand provides dissipation of energy and increases shear stresses on the surface of cement particles.

A. Residual water C. HEM process
B. Premixed paste D. None of the above

76. The quasi-laminar flow of the mixture characterized with Reynolds number less than 800 is necessary to provide more effective energy absorption.
A. 100 C. 5,000
B. 800 D. None of the above

77. The initial natural process of _____ with formation of colloidal globules about 5 nm in diameter after 3-5 min of HEM spreads out over the entire volume of cement – water matrix. HEM is the "bottom-up" approach in Nanotechnology of concrete.
A. Uniform mixture(s) C. Cement hydration
B. Premixed paste D. None of the above

78. The liquid activated mixture is used by itself for casting small architectural details and decorative items, or foamed (expanded) for_____.
A. HEM Nano concrete C. Lightweight concrete
B. Volumetric stability D. None of the above

79. _____hardens in low and subzero temperature conditions and possesses an increased volume of gel, which drastically reduces capillarity in solid and porous materials.
A. HEM Nano concrete C. Quasi-laminar flow of the mixture
B. Volumetric stability D. None of the above

Workability
80. Workability is the ability of a fresh (plastic) concrete mix to fill the form/mold properly with the desired work (vibration) and without reducing the _____.
A. Concrete's quality C. A relatively wet concrete sample
B. High-flow concrete D. None of the above

81. Workability depends on water content, aggregate (shape and size distribution), cementitious content and age (level of hydration) and can be modified by adding chemical admixtures, like _____.
A. Superplasticizer C. Water-cement ratio
B. Very low slump D. None of the above

82. Raising the water content or adding _____increases concrete workability.
A. Concrete's quality C. Chemical admixtures
B. High-flow concrete D. None of the above

83. The use of an aggregate with an undesirable gradation can result in a very harsh mix design with a very low slump, which cannot readily be made more workable by addition of reasonable amounts of_____.
A. Very low slump C. Water
B. Slump D. None of the above

Concrete Slump Test
84. Workability can be measured by the concrete slump test, a simplistic measure of the plasticity of a _____ following the ASTM C 143 or EN 12350-2 test standards.
A. Concrete's quality C. Fresh batch of concrete
B. High-flow concrete D. None of the above

85. _____ is normally measured by filling an "Abrams cone" with a sample from a fresh batch of concrete.
A. High-flow concrete C. A relatively wet concrete sample
B. Slump D. None of the above

86. _____ may slump as much as eight inches. Workability can also be measured by the flow table test.
A. High-flow concrete C. A relatively wet concrete sample
B. Slump D. None of the above

87. _____ can be increased by addition of chemical admixtures such as plasticizer or superplasticizer without changing the water-cement ratio. Some other admixtures, especially air-entraining admixture, can increase the slump of a mix.
A. High-flow concrete C. A relatively wet concrete sample
B. Slump D. None of the above

88. _____, like self-consolidating concrete, is tested by other flow-measuring methods.
A. High-flow concrete C. A relatively wet concrete sample
B. Slump D. None of the above

89. After mixing, _____is a fluid and can be pumped to the location where needed.
A. Superplasticizer C. Water-cement ratio
B. Concrete D. None of the above

Curing

90. In around _____ weeks, typically over _____% of the final strength is reached, though strengthening may continue for decades.
A. 4 - 75 C. 4 - 90
B. 10- 90 D. None of the above

91. The conversion of calcium hydroxide in the concrete into calcium carbonate from _____ over several decades further strengthens the concrete and makes it more resistant to damage.
A. Absorption of CO_2 C. Ill effects of ambient condition(s)
B. Greater shrinkage cracking D. None of the above

92. _____ of concrete during the first three days is critical.
A. Hydration C. Hydration and hardening
B. Structure exploitation D. None of the above

93. Abnormally fast drying and shrinkage due to factors such as evaporation from wind during placement may lead to increased tensile stresses at a time when it has not yet gained sufficient strength, resulting in _____.
A. Properly curing concrete C. Greater shrinkage cracking
B. Cement pore solution D. None of the above

94. The early strength of the concrete can be increased if it is kept damp during the curing process. Minimizing stress prior to_____ .
A. Curing process C. Curing minimizes cracking
B. Structure exploitation D. None of the above

95. High-early-strength concrete is_____ , often by increased use of cement that increases shrinkage and cracking.
A. High-early-strength concrete C. Ill effects of ambient condition(s)
B. Designed to hydrate faster D. None of the above

96. The strength of concrete changes (increases) for up to three years. It depends on cross-section dimension of elements and_____ .
A. Curing process C. Conditions of structure exploitation
B. Structure exploitation D. None of the above

97. Care must also be taken to avoid freezing or overheating due to the_____. Improper curing can cause scaling, reduced strength, poor abrasion resistance and cracking.
A. Properly curing concrete C. Greater shrinkage cracking
B. Exothermic setting of cement D. None of the above

Properties
98. Concrete has relatively high compressive strength, but much lower_____ . For this reason, it is usually reinforced with materials that are strong in tension (often steel).
A. Hydration C. Tensile strength
B. Structure exploitation D. None of the above

99. The _____ is relatively constant at low stress levels but starts decreasing at higher stress levels as matrix cracking develops.
A. High-early-strength concrete C. Ill effects of ambient condition(s)
B. Elasticity of concrete D. None of the above

100. Concrete that is subjected to _____is prone to creep.
A. Water content C. Long-duration forces
B. Concrete's quality D. None of the above