Government Polytechnic for Girls, Ahmedabad
Civil Engineering Department
Subject: Maintenance and Rehabilitation of Structure (3360605)

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MCQ-Tick (√) the correct answer.

Q.1. Building maintenance is

(i) the work undertaken to keep, restore or improve every facility or services.

(ii) the combination of technical and administrative actions to ensure all components to perform its required function.

(iii) preventive in nature and

(iv) activities include inspection and works necessary to fulfill the intended function

ANS. (a) i and iv are correct (b) ii and iii are correct (c) i, ii and iv are correct (d) **all the above**

Q.2. The objective of maintenance is

(i) To prevent damages due to natural agencies

(ii) To satisfy Lender / Insurer requirement,

(iii) to provide a safe, secure and efficient working & living environment

(iv) To maximize the aesthetic and economic values of a building as well as increase the

health and safety of the occupants

ANS. (a) ii and iv are correct (b) i, ii and iii are correct (c) only iii is correct (d) **all the above**

Q.3. The expected economic life of the building under normal occupancy and maintenance

Conditions for RCC Framed construction is

ANS.(a) 100 year (b) 60 Year (c) **75 year** (d) None

Q.4. The Maintenance work is broadly classified in

ANS.(a) two groups (b) **Four group** (c) three group (d) None

Q.5. Basic steps for Remedial Maintenance are Finding the deterioration

(i) Finding the deterioration

(ii) Determining the causes

(iii)Evaluating the strength and need of the existing structure

(iv) Selecting and implementing the repair procedure

ANS. (a) i and iv are correct (b) i and iii are correct (c) only iii is correct (d) **all the above**

Q.6. The causes which necessitate the maintenance effects, the service and durability of the

Structure are

(i) Atmospheric agencies (ii) Normal wear and tear

(iii) Failure of structure (iv) weak and poor Construction

ANS. (a) i, ii and iii are correct (b) i and iii are correct (c) iii and iv are correct (d) **all the above**

Q.7. The various maintenance aspects are,

(i) Preventive and Remedial Maintenance

(ii) Daily Routine and Weekly Routine Maintenance

(iii) Routine and Special Maintenance

(iv) Monthly Routine and Yearly Routine Maintenance

ANS. (a) i and ii are correct (b**) ii and iv are correct** (c) i and iii are correct (d) all the above

Q.8. Maintenance is a continuous cycle involves every element of building science namely

(i) Electrical wiring (ii) Plumbing-water-supply-sanitation

(iii) Finishes in floors and walls (iv) Door, window and paintings

ANS. (a) ii and iii are correct (b) i and iv are correct (c) ii and iv are correct (d) **all the above**

Q.9. The building services fixtures including internal wiring; water supply distribution system etc. is expected to last for_____.

ANS. (a)15-20 years (b) **20-25 years** (c) 30-35 years (d) 35-40 years

Q.10. The special repairs to buildings shall be divided in _____ groups.

ANS. (a) 4 (b) 5 (c) **6** (d) 7

Q.11. Blistering, Peeling, Flaking, cracking and Bleaching are the defects of

ANS. (a) Flooring (b) Masonry work (c) **Painting** (d) Plastering

Q.12. Identify the following defect of painting in building.

ANS. (a) **Peeling** (b) Blistering (c) Efflorescence (d) Bleaching

Q.13. The covering capacity of the steel and wood primers is about ¬¬¬¬¬_____ m^2/lit per coat.

ANS. (a) 8 to 10 (b) 10 to12 (c) **12 to 15** (d) None

Q.14. The popular Snowcem paints available in the market is the type of_____.

ANS. (a) Oil paint (b) Distemper (c) **Cement paint** (d) None

Q.15. The test is generally used for measurement of concrete uniformity, determination of cracking and honeycombing, and assessment of concrete deterioration is

ANS. (a) Core test (b) Compression test (c) Rebar Locator test (d) **USPV test**

Q.16. The bar diameter, cover to reinforcement, spacing of reinforcement, number of reinforcing bars and any discontinuity in the reinforcing bars can be detected by

ANS. (a) Core test (b) Carbonation test (c) **Rebar Locator test** (d) USPV test

Q.17. Main objective of condition assessment is to decide the

(i) building has not shown any signs of distress and no action is needed towards retrofitting.

(ii) building is seen to be deficient (or distressed) but it can be repaired and strengthened to satisfy the performance criteria.

(iii) building is badly damaged, and it is to be demolished and a new building may be build back better.

(iv) building has high cost on selling with its serviceability.

ANS. (a) i and ii are correct (b) **i, ii and iii are correct** (c) iii and iv are correct (d) All the above

Q.18. Main steps of condition assessment are

(i) To record the damage if any, and find out the causes for distress

(ii) To assess the extent of distress

(iii) To estimate the residual strengths of structural components and the system including the foundation.

(iv) To plan the rehabilitation and retrofitting/strengthening of the building.

ANS. (a) i and ii are correct (b) i, ii and iii are correct (c) iii and iv are correct
(d) **All the above**

Q.19. Rapid (Visual) Investigation of structure involves

(i) Collection of information and details about the building design, construction, utilization, and maintenance in the past

(ii) Visual inspection of condition at site and recording details of distress

(iii)Identification of potential non-structural falling hazards

(iv) Evaluation of safety against the provisions in building codes or specified performance criteria

ANS. (a) i , ii and iii are correct (b) ii, iii and iv are correct (c) iii and iv are correct
(d) **All the above**

Q.20. The visual inspection includes

(i) Verification of the accuracy of the original drawings or determination of basic building information, if no drawings are available.

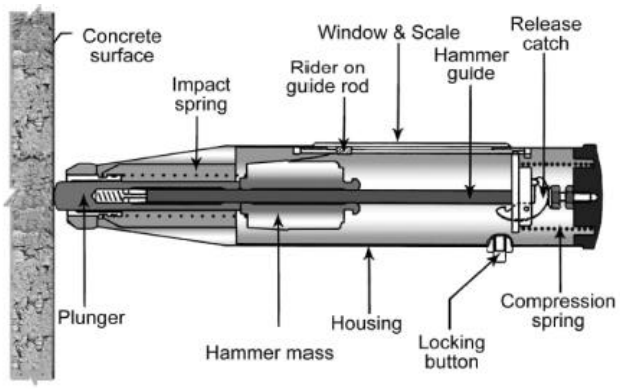
(ii) Identification of major alterations not shown on the original construction documents.

(iii) Identification of visible structural damage, such as concrete cracking or spa1ling, and observations on quality of construction

(iv) Identification of potential non-structural falling hazards, including ceilings, partitions, curtain Walls, parapets, fixtures, and other non-structural building elements.

ANS. (a) ii and iii are correct (b) i, ii and iii are correct (c) iii and iv are correct
(d) **All the above**

Q.21. Give the name of following equipment



ANS. (a) Jack hammer (b) Penetrometer (c) **Rebound Hammer** (d) Core cutter

Q.22. The use of Rebound hammer is to determine _____ of concrete.

ANS. (a) **Surface hardness and strength** (b) Durability of concrete

(c) Permeability of concrete (d) Depth of Penetration

Q.23. If the value of USPV test of concrete member is more than 4 km/sec. (V), the quality of

concrete is

ANS. (a) Good (b) **Very good** (c) Poor (d) Very poor

Q.24. State incorrect statements for…The Main causes of distress in buildings are

(i) Deficiencies in design and Poor detailing of reinforcement in RC structural members

and joints

(ii) Good quality of construction and no Corrosion effect of reinforcement

(iii) Inadequacies in the structural system to resist lateral forces due to natural hazards

(iv) Stable and no differential settlement of foundation and Extreme or unforeseen

loading.

ANS. (a) i and ii are correct (b) i, ii and iii are correct (c) iii and iv are correct (d) **ii and iv**

Q.25. Condition Survey or assessment of a building is

(i) an examination of concrete for the purpose of identifying and defining area of distress.

(ii)is referred in connection with survey of concrete and embedded reinforcement that is

showing some degree of distress

(iii) recommended for all buildings and structures.

(iv) designed to be used for recording the life of the project from its inception to complete

and subsequent life.

ANS. (a) i ,iii and iv are correct (b) ii and iii are correct (c) i , ii and iv are correct

(d) **All the above**

Q.26. The stages of condition survey are

(i) Preliminary inspection

(ii) Planning stage

(iii) Visual inspection

(iv) Field and laboratory testing

ANS. (a) i , ii and iii are correct (b) i, ii and iv are correct (c) ii and iii are correct

(d) **All the above**

Q.27. The main objectives of condition survey of a building structure are

(i) To identify causes of distress and their sources

(ii) To assess the extent of distress occurred due to corrosion, fire, earthquake, etc.,

the residual strength of the structure and the rehabilitability of structure

(iii) To priorities the distressed elements of structure according to seriousness for repairs.

(iv) To select and plan the effective remedy.

ANS. (a) i ,ii, iii are correct (b) i, ii and iv are correct (c) ii and iii are correct (d) **All the above**

Q.28. The objectives of the preliminary inspection are:

(i) To collect the necessary information for a thoughtful planning of a condition survey.

(ii) To advise the owner/client of the building regarding immediate safety measures

(iii)To avert any mishap endangering life and structure.

(iv) To define the scope of work of field investigations in consultation with the clients.

ANS. (a) i and ii are correct (b) i, ii and iv are correct (c) ii and iii are correct (d) **All the**

above

Q.29. The data to be collected in the preliminary survey are

(i) Period of construction of building and architectural drawing

(ii) Design details and drainages, structural drawings

(iii)Destructive and Nondestructive test report of existing condition

(iv)Specifications of materials used and Foundation details, soil conditions

ANS. (a) i and ii are correct (b) **i, ii and iv are correct** (c) ii and iii are correct (d) All the above

Q.30. In which planning stage of condition survey, its objectives, scope of work, method of Survey, field and laboratory test requirement, floor plan and work sheet details are prepared?

(i) Preparation of field documents (ii) Grouping of structural members

(iii) Basic information gathering (iv) Classification of damage

ANS. (a) i and ii are correct (b) i, ii and iv are correct (c) **i is correct** (d) All the above

Q.31. The planning stage of condition survey are

(i) Preparation of field documents (ii) Grouping of structural members

(iii) Basic information gathering (iv) Classification of damage

ANS. (a) ii ,iii and iv are correct (b) **i, ii and iv are correct** (c) i and ii is correct (d) All the above

Q.32. If spalling of concrete cover, major structural crack, including cracking along reinforcement due to corrosion or otherwise leading to substantial reduction of load carrying capacity, then the classification of damage of structure is falls under_____ category

ANS. (a) Class 1 (b) Class 2 (c) **Class 3** (d) Class 4

Q.33. Excessive spalling resulting in a major reduction of c/s, almost all reinforcement exposed,

extensive cracking along reinforcement indicating the bond failure b/w concrete & reinforcement noticeable deformation or distortion, major structural loss necessitating replacement of members requires repair strategies as

ANS. (a) Superficial Repairs (b) Principal Repairs

(c) **Major repair/ Demolition and recasting** (d) Minor structural repairs

Q.34. The visual inspection of condition survey is carrying out for

(i) Verification of information collected during desk /site study

(ii) Record of the existing condition of concrete, i.e., bug holes, cold joints, honey combing,

exposed reinforcement, corrosion etc.

(iii) Presence of cracking i.e. location, depth, width, nature of cracking, the surface

appearance of the cracks, current state of activity,

(iv) Damage to structural elements & finishes like blistering membranes and coatings.

ANS. (a) ii, iii and iv are correct (b) i, ii and iv are correct (c) i and ii is correct (d) **All the above**

Q.35. When the pertinent data like the original construction drawings and design of the structure,

foundation details and structural details are not available, then ¬¬¬¬¬_____ investigation is

carried out.

ANS. (a) Preliminary (b) **Detailed** (c) Final (d) None of above

Q.36. If the average Rebound number of Schmidt hammer test on concrete surface is between 30

To 40, then quality of concrete surface is

ANS. (a) Very good (b) **Good** (c) Poor layer (d) Fair

Q.37. Worksheets are documents which includes

(i) floor plans, charts, statistical formats to record relevant data, observations, quality,

type and extent of damage, etc.

(ii) structural components like slab, column, beam, RCC projections under investigation

(iii) defects notation, moisture, leakage and dampness locations, exposure condition

(iv) work out bill of quantities of various repair items

ANS. (a) ii, iii and iv are correct (b) i, ii and iv are correct (c) i and ii are correct (d) **All the above**

Q.38. The main purposes of using Chemical admixtures in fresh concrete are

(i) mixed with concrete ingredients and spread throughout the body of concrete to favorably modify the moulding and setting properties.

(ii) applied on the surfaces of moulds used to form concrete to effect easy mould-releasing operation.

(iii) applied on the surfaces of concrete to protect it during or after its setting.

(iv) applied to bond or repair broken or chipped concrete.

ANS. (a) i, ii and iii are correct (b) i, ii and iv are correct (c) i and ii are correct (d) **All the above**

Q.39. Accelerators type admixture are used to reduce¬¬¬¬¬¬¬¬¬_____ of concrete

ANS. (a) Bleeding (b)**Setting time** (c) Strength (d) Hardness

Q.40. Accelerators type admixture are used in _____ concreting.

ANS. (a) Reach mix (b) Hot weather (c) **Cold weather** (d) None of above

Q.41. Which chemical is used as accelerator in concreting?

ANS. (a) **$Cacl_2$** (b) $Nacl_2$ (c) $Mgcl_2$ (d) all the above

Q.42. The limit of quantity of $Cacl_2$ is mixed in fresh concrete is_____ % by weight of cement.

ANS. (a) 1 to 1.5 (b) **1.0 to 2.0** (c) 1.5 to 2.0 (d) 2.0 to 2.5

Q.43. Retarder are used as concrete chemicals to

(i) increase the setting time of the concrete mix

(ii) reduce the water-cement ratio

(iii) increase the surfaces activity

(iv) imparts a soapy property to the mix and delays setting.

ANS. (a) ii, iii and iv are correct (b) i, ii and iv are correct (c) i and ii are correct (d) **All the above**

Q.44. A plasticizer is defined as an admixture added to wet concrete mix to impart adequate

ANS. (a) water- cement ratio (b) **workability** (c) Strength (d) All the above

Q.45. Retarder used as concrete chemicals are

(i) lignosulphonic acids and their salts

(ii) hydroxylated carboxylic acid and their salts

(iii) sulphonated melamine

(iv) naphthalene formaldehyde

ANS. (a) i, ii and iii are correct (b) i, ii and iv are correct (c) ii and iii are correct (d) **All the above**

Q.46. Retarders reduce the water-cement ratio in concrete mix up to

ANS. (a) 5% (b) **10%** (c) 12% (d) 15%

Q.47. Retarder used as concrete chemicals to achieve designed mix in

ANS. (a) cold weather (b) **hot weather** (c) Rainy weather (d) None of the above

Q.48. Finely Divided Minerals, Air-Entraining Agents , Synthetic Detergents ,Produces Soapy action and Produces discontinuous air bubbles are the properties of

ANS. (a) Accelerator (b) Retarder (c) **Plasticizer** (d) Super plasticizer

Q.49. Chloride containing calcium chloride restricted to_____ % for plain concrete construction.

ANS. (a) **1.5** (b) 1.0 (c) 1.75 (d) 2.0

Q.50. Flowing concrete, extreme workability, savings in cement for a given strength, ideal for pumping concrete and casting heavily reinforced concrete members can be achieved by using

ANS. (a) Plasticizer (b)Accelerator (c) Retarder (d) **Super plasticizer**

Q.51. Drying shrinkage in setting of concrete is reduce by using

ANS. (a) Pozzolan cement (b) **Expansive cement** (c) special cement(d) All the above

Q.52. Polymers are used in producing Polymer concrete to minimize

ANS. (a) **Void volume** (b) Density (c) Water content (d) All the above

Q.53. Which of following statement is incorrect for Polymer concrete?

(i) High tensile, flexural, and compressive strengths

(ii) High permeability to water and aggressive solutions

(iii)Good long-term durability with respect to freeze and thaw cycles

(iv) Low resistance against corrosion and heavy weight

ANS. (a) i and ii (b) **ii and iv** (c) ii and iii (d) iii only

Q.54. The strength obtained with PC can be as high as _____MPa with a short curing method.

ANS. (a) 100 (b) **140** (c) 120 (d) 150

Q.55. The performance of _____is more satisfactory against freezing and thawing, seawater attack and wetting and drying.

ANS. (a) Polymer Impregnated Concrete (b) Polymer Cement Concrete
(c) **Sulphur-Infiltrated concrete** (d) Polymer Concrete

Q.56. The minimum sulphur loading varies from _____% for 0.70 water-cement ratio to _____% for 0.40 water-cement ratio.

ANS. (a) **10 and 5** (b) 5 and 10 (c) 10 and 15 (d) 15 1nd 10

Q.57. Ferro cement is a type of thin reinforced concrete, constructed of cement mortar reinforced with closely spaced wire mesh of _____ diameter

ANS. (a) .5 to .8 mm (b) **0.5 to 1.0mm** (c) 1.0 to 1.2mm (d) 1.0 to 1.5mm

Q.58. Ferro cement is constructed of cement mortar reinforced with cement mortar of cement sand ratio of with _____water/cement ratio of 0.4 to 0.45.

ANS. (a) 1:1 to1:2 (b) 1:2 to 1:4 (c) **1:2 or 1:3** (d) all the above

Q.59. The water cement ratio for Ferro cement varies from _____ to _____.

ANS. (a) 0.25 to .35 (b) **0.4 to 0.45** (c) 0.35 to.40 (d)0.30 to 0.40

Q.60. The thickness of ferrocement elements are usually kept between_____ cm with 2 to 5mm external cover to the reinforcement.

ANS. (a) 3 to 4 (b) **2 to 3** (c) 3 to 5 (d)2.5 to 4

Q.61. The closely spaced wires mesh is the most commonly used in Ferro cement to control the _____.

ANS. (a) expansion (b) thickness (c) **cracking** (d) all the above

Q.62. The following items are prepared with ____________________________.

ANS. (a)Polymer concrete (b) **Ferro cement** (c) Special mortar (d) Fiber reinforced

concrete

Q.63. The properties of FRC are

(i) more tensile strength and

(ii) good abrasion resistance of concrete.

(iii) low thermal and electrical conductivity.

(iv) high compressive strength.

ANS. (a) i, ii and iii (b) ii , iii and iv (c) ii and iii (d) **all the above**

Q.64. The aspect ratio of the fiber in fiber reinforced concrete ranges from ______to_______.

ANS. (a) **30 to 150** (b) 50 to 100 (c) 30 to 100 (d) 40 to 150

Q.65. The diameter of steel fiber used in FRC may vary from________ to _________ mm.

ANS. (a) 0.25 to 1.00 (b) **0.25 to 0.75** (c) 0.35 to 0.75 (d) 0.25 to 0.90

Q.66. Steel, Glass, Polypropylene, Asbestos, Carbon of very thin diameter wired type material are used in¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬____________________________.

ANS. (a) Compact Reinforces Concrete (b) Ferro cement

(c) **Fiber reinforced concrete** (d) All

Q.67. The glass fiber has very high tensile strength of ______________________N/mm^2.

ANS. (a) 900 to 3250 (b) 1200 to 3500 (c) **1020 to 4080** (d) 1000 to 4500

Q.68. The steel fiber has very high tensile strength of________________ N/mm^2.

ANS. (a) 1600 (b) **1700** (c)1800 (d) 1500

Q.69. Tensile strength of asbestos varies between ________________N/mm^2.

ANS. (a) **560 to 980** (b) 580 to 1000 (c) 575 to 950 (d) 550 to 950

Q.70. For high corrosive atmospheres caused by chloride ions from the de-icing salts applied to

protect against sodium chloride and calcium chloride, usually near seashores,_____

is applied to protect steel reinforcing bars from corrosion

ANS. (a) Resins blended with organic solvents (b) **epoxy coating**

(c) Solvent free coating (d) all the above

Q.71. The concrete can be placed without a bonding agent and without grout on the prepared

surface of the old concrete is

ANS. (a) polymer concrete (b) **Formed concrete** (c) Compact Reinforces Concrete (d) All the above

Q.72. US bureau of reclamation suggests that the formed concrete method should be used

(i) When the depth of the repair exceeds 150 mm,

(ii) For holes extending right though the concrete section

(iii) For holes in unreinforced concrete with area greater than 0.1m2 and over 100 mm deep

(iv)For holes in reinforced concrete which have an area greater than 0.05m^2 and which extend deeper than the reinforcement.

ANS. (a) i, ii and iii (b) ii , iii and iv (c) i and ii (d) **all are correct**

Q.73. Which of following is true in case of

Dry packing is the hand placement which is subsequently rammed in to place to produce

a dense mortar plug having tight contact to the existing concrete.

ANS. (a) low W/C ratio mortar (b) good durability (c) strength and water tightness (d) **All the above**

Q.74. In crack repairing for concrete ,the holes for dry pack should have a minimum depth of _____cm.

(a) **2.54** (b) 3.00 (c) 3.50 (d) 2.25

Q.75. The process by which a high workable and high strength concrete produce is known as

ANS. (a) Formed concrete (b) **Vacuum concrete** (c) Dry pack concrete (d) None of above

Q.76. When mortar is conveyed through a hose and pneumatically projected at a high velocity

onto a surface to repair called

ANS. (a) Shotcrete (b) **Gunite** (c) Dry pack (d) All are correct

Q.77. The material deposited by this process is called GUNITE in this process the mixture of cement and sand are conveyed by compressed air at high velocity ranging from about Meters/Sec

ANS. (a) 80 (b) **100** (c) 120 (d) 140

Q.78. The method developed by the introduction of small sized coarse aggregate into the mix

deposited to obtain considerably greater thickness in one operation and to make the process economical by reducing the cement content is known as

ANS. (a) **Shotcrete** (b) Gunite (c) Dry pack (d) All are correct

Q.79. The durability or resistance to frost action and other agencies of dry shotcrete is_____.

ANS. (a) Poor (b) **Good** (c) Very good (d) None

Q.80. The technique consists of drilling hole at close intervals along the length of cracks and

the injection of polymer under pressure to the full depth of the crack is known as

ANS. (a) Shotcrete (b) **Injection** (c) Dry pack (d) All are correct

Q.81. A series of holes usually 20mm in diameter and 20mm deep spaced at_____ mm

interval intercepting the crack at a number of locations are drilled.

ANS. (a) 100TO 125 (b) 125 TO 150 (c) **150 to 300** (d) 200 TO 300

Q.82. If high injection pressures are needed, the crack should be routed to a depth of about

_____mm and width of about _____mm in V-shape, filled with an epoxy and stuck off

flush with the surface.

ANS. (a) 10 and 20 (b) **12 and 20** (c) 15 and 20 (d) 15 and 25

Q.83. The factors which accelerates the process of corrosion in R.C. structures are

ANS. (a) Chlorides (b Chlorine and Sulphates (c) Methane Acids

(d) **All are correct**

Q.84. The Chloride limits in concrete for new construction, expressed as a percent by weight of

cement for

(i) Pre-stressed concrete is 0.08%

(ii) Reinforced concrete in wet conditions is 0.10%

(iii)Reinforced concrete in dry conditions 0.20%

(iv) in existing structures 0.026% is enough to breakdown the Passive Layer.

ANS. (a) i , ii and iii are correct (b) ii and iii are correct (c) ii ,iii and iv are correct

(d) **All are correct**

Q.85. The methods for protecting steel from corrosion are

(i) Protective coatings for reinforcement (ii)Cathodic protection

(iii) Corrosion Resistant steel (iv) Corrosion inhibitors

ANS. (a) i , ii and iii are correct (b) ii and iii are correct (c) ii ,iii and iv are correct

(d) **All are correct**

Q.86. Cathodic protection (CP) is a technique to control the corrosion of a metal surface by making it work as a cathode of an electrochemical cell. This method is also known as

ANS. (a) Protective coatings system (b) **sacrificial anode cathodic protection system**

(c) Corrosion Resistant system (d) Impressed current cathodic protection

Q.87. The organic compound which when activated with suitable hardening agents form strong

chemically resistant structures having excellent adhesive properties is known as

ANS. (a) Polymers (b) **Epoxy** (c) monomers (d) all

Q.88. Suggest the suitable techniques to repair effectively the following work.

(i) Renovations of plain or RCC structure deteriorated due to weather, bad workmanship,

(ii) Strengthening of old structures.

(iii)Lining of water reservoir canals

(iv) protection of exposed prestressed wires in structures like water towers, chimneys, concrete pipes etc.

ANS. (a) Grouting (b) Jacketing (c) **Guniting** (d) Coating

Q.89. The width of thin crack in concrete or masonry structure is up to

ANS. (a) **1 mm** (b)1 to 2 mm (c) 0.5mm (d) 1.5 mm

Q.90. If the width of crack in concrete or masonry structure is up to 1 to 2 mm, then it is a

ANS. (a) Thin (b) **Medium** (c) Wide (d) Large

Q.91. The techniques of injecting a mixture of cement, sand, water, clay, chemicals, at high pressure in the cracks, joints, fissures, voids etc.is known as

ANS. (a) Shotcreting (b) Guniting (c) **Grouting** (d) Coating

Q.92. The grout is inserted in the holes at a pressure _____kg/cm^2 per depth of hole.

ANS. (a) 0.50 (b) **0.65** (c) 0.75 (d) 1.0

Q.93. The following pictures shows _____ techniques of repair for damaged

structures.

ANS. (a) Watering (b) **Shotcreting** (c) Grouting (d) Coating

Q.94. The following pictures shows _____ techniques of repair for damaged structures

ANS. (a) Watering (b) Guniting (c) **Grouting** (d) Coating

Q.95. The nozzle should be kept at a distance_____ mm from the surface in wet Process of shotcreting.

ANS. (a) 600 (b) 750 (c) **900** (d) 1000

Q.96. A considerable quantity of mortar, which is jetted on the surface to be treated will fall back due to the high velocity of jet during shotcreting is called as _____.

ANS. (a) Falling (b) Wastage (c) **Rebound** (d) All

Q.97 The repairing techniques for crack in concrete shown in following image is called as

ANS. (a) **Epoxy injection** (b) Guniting (c) Grouting (d) Drilling

Q.98. The concrete is made by introducing air or gas into a slurry composed of Portland cement or lime and finely crushed siliceous filler so that when the mix sets and hardens, is known as_____.

ANS. (a) Vacuum concrete (b) **Aerated concrete** (c) Light weight concrete (d) No fines concrete

Q.99. A crystalline deposit of salts that can form when water is present in or on brick, concrete, stone, stucco or other building surfaces

ANS. (a) Blistering (b) Pilling (c) **Efflorescence** (d) ALL

Q.100. Occurrence of closely spaced fine cracks at surface of a material is sometimes called _____ cracks.

ANS. (a) **Crazing** (b) Zig zag (c) Layered (d) Crossing

Q.101. Principal causes of occurrence of cracks in buildings are as follows:

(i) moisture changes

(ii) thermal variations,

(iii)elastic deformation and foundation movement and

(iv)settlement of soil

ANS. (a) i, ii and iii (b) ii, iii and iv (c) ii and iii (d) **All are correct**

Q.102. The technique in which the crack is bridged with U-shaped metal units and a non-shrink

grout or an epoxy resin based adhesive should be used to anchor the legs of the dogs,when

tensile strength must be reestablished across major cracks is known as _____.

ANS. (a) Resin injection (b) Plugging (c) **Stitching** (d) Bandaging

Q.103. _____ are usually selected for crack repairing because of their high mechanical

strength and resistance to most chemical environments encountered by concrete.

ANS. (a) **Epoxy Resin injection** (b) Plugging (c) Flexible Sealing

(d) Polymer impregnation

Q.104. The simplest and most common method of crack repair that can be repaired with relatively

unskilled labor for fine pattern cracks and larger isolated cracks is _____¬¬¬¬¬¬___method.

ANS. (a) Stitching (b) Plugging (c) **Routing and sealing** (d) Resin injection

Q.105. The flexural cracks in beam occur at

(i) the maximum moment region

(ii) the section capacity to resist the moment of resistance is less

(iii) where the reinforcement is inadequate

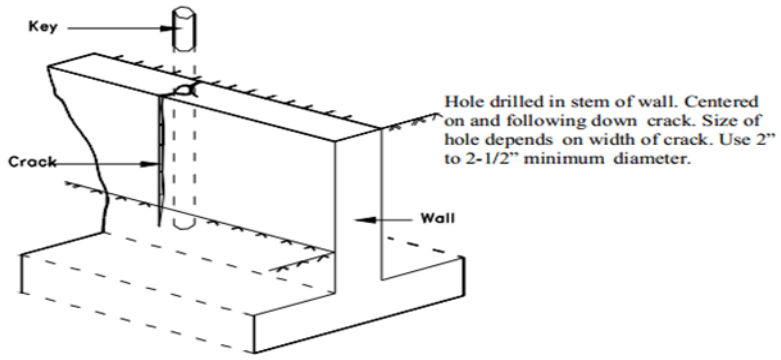
(iv) section provided may not be sufficient

ANS. (a) i, ii and iv (b) i, iii and iv (c) i and ii (d) **All the above**

Q.106. The minimum width of crack that can be seen by naked eye is generally about_____ mm

ANS. (a) 1.1 (b) 1.2 (c) **1.3** (d) 1.4

Q.107. Identify the techniques of repair crack in concrete from following figure.



ANS. (a) Stitching (b)**Drilling and Plugging** (c) Routing and sealing (d) Resin injection

Q.107. The process of restoring something that is damaged or deteriorated or broken, to good

condition and to bring back the architectural shape of the building so that all services start working and the functioning of building is resumed quickly.

ANS. (a) Restoration (b) **Repair** (c) Strengthening (d) Retrofitting

Q.108. The process of returning a building or an area to its previous good conditions OR restoring the structure to service level; it once had and now lost.

ANS. (a) Restoration (b) Repair (c) **Rehabilitation** (d) Retrofitting

Q.109. Which is true stage of repair of concrete structure from followings.

(i) Removal of damaged concrete

(ii) Pretreatment of surfaces and reinforcement

(iii) Application of repair materials

(iv) Restoring the integrity of individual sections and strengthening of structure.

ANS. (a) i,ii and iii (b) i, ii and iv (c) ii, iii and ivd) **All the above**

Q.110. The technique used to regain the strength of deteriorated structural concrete elements and to prevent further distress in concrete.

ANS. (a) Restoration (b) Repair (c) Rehabilitation (d) **Retrofitting**

Q.111. The section enlargement/Jacketing, external plate bonding, external post-tensioning, grouting, and fiber reinforced polymer composites etc. are the techniques of

ANS. (a) **Retrofitting** (b)Rehabilitation (c) Restoration (d) Repair

Q.112. The RCC structural members experience some common problems or Damages and needed to be tackled. Suggest effective techniques as remedial measure for

(i) Structural cracks.

(ii)Damage to structural members and Seismic damage

(iii)Excessive loading and Errors in design or construction.

(iv)Modification of structural system.

ANS. (a) Restoration (b) Repair (c) Strengthening (d) **Retrofitting**

Q.113. The process of strengthening and stabilizing the foundation of an existing building or other structure is called

ANS. (a) Shoring (b)Rehabilitation (c) Restoration (d) **Underpinning**

Q.114. Which of the method adopted under following situation in building construction?

(i)The original foundation is simply not strong or stable enough, e.g. due to decay of wooden piles under the foundation.

(ii)The usage of the structure has changed.

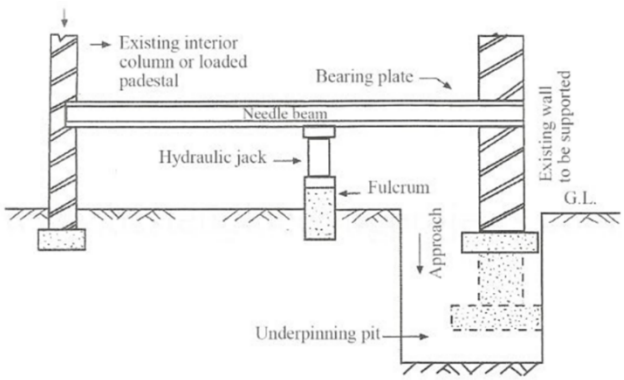
(iii)The properties of the soil supporting the foundation may have changed (possibly through subsidence) or were mischaracterized during planning.

(iv)The construction of nearby structures necessitates the excavation of soil supporting

existing foundations

ANS. (a) Shoring (b) **Underpinning** (c) Restoration (d) Rehabilitation

Q.115. Give the name of following method of Underpinning.



ANS. (a) Pit method (b) **Cantilever Needle beam method** (c) Pier and beam

method (d) All the above

Q.116. When the loads from the foundation is transferred to strata located at a distance greater

than 5m and soil that has variable nature, access is restrictive and causes environmental

pollution problems, then the method of underpinning implemented is

ANS. (a) Pier and beam method (b) **Mini Piled method** (c) Pile Method (d) Pre-test method

Q.117. The means of providing support to get stability of a structure temporarily under certain

circumstances during construction, repair or alteration is known as

ANS. (a) **Shoring** (b)Rehabilitation (c) Restoration (d) Underpinning

Q.118. The shoring method is adopted when the

(i) The stability of a structure is endangered due to removal of a defective portion of the

structure.

(ii) The stability of a structure is endangered due to unequal settlement during

construction itself or in long run.

(iii) Certain alterations are to be done in present structure itself. Eg: remodeling of walls,

changing position of windows, etc.

(iv) Alterations are carried out in adjacent building for remodeling, strengthening of

foundation, etc.

ANS. (a) Restoration (b)Rehabilitation (c) **Shoring** (d) Underpinning

Q.119. Shores consist of one or more timbers sloping between the face of the structure to be

supported and the ground is called as

ANS. (a) Dead Shoring (b)**Raking shoring** (c) Flying shoring (d) None

Q.120. The most effective support is given if the raker meets the wall at an angle of_____

Degrees in raking shore.

ANS. (a) **60 to 70** (b)70 to 80 (c)50 to 60 (d) 45 to 65

Q.121. The effects or damages like dry rot of woodwork, Disintegration of masonry, Damage to

furniture, crumbling of plaster occur tn the building due to

ANS. (a) Settlement (b)**Efflorescence** (c) Cracking (d) subsidence

Q.122. The Cracks leading to structural failure is known as _____ type of crack.

ANS. (a) **Class-1** (b) Class-2 (c) Class-3 (d) Class-4

Q.123. The causes of crack in structure are

(i) Use of unsound material and Poor workmanship

(ii) Use of high water-cement ratio

(iii) Thermal effects and Shrinkage stresses

(iv) Freezing & thawing process

ANS. (a) i, ii and iv (b) i, iii and iv (c) i and ii (d) **All the above**

Q.124. An admixture that is used in concrete to prevent the metal embedded in concrete from

corroding is known as

ANS. (a) **Corrosion inhibitor** (b) concrete inhibitor (c) concrete chemical (d) All

Q.125. The development of the fragments usually in the shape of the flakes, due to corrosion of

steel or freeze thaw effects is known as

ANS. (a) Erosion (b) **Spalling** (c) Stain (d) Cracking