SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Concrete Technology (16CE118) **Course & Branch**: B.Tech - CE

Year & Sem: III B.Tech & I Sem **Regulation:** R16

UNIT –I

1. What are Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement. 10M
2. a. Explain heat of hydration and hydration process of cement in detail. 5M
   b. Explain setting time of cement and factors effecting setting time of cement. 5M
3. a. Discuss the chemical composition of Ordinary Portland cement. 5M
   b. Briefly explain different types of cement. 5M
4. a. Explain the term super plasticizers. How are they useful in concrete production? 5M
   b. Explain the advantages of using plasticizers and super plasticizers in concrete making. 5M
5. a. Discuss the difference between the wet and dry process of manufacturing of Portland cement. 5M
   b. Draw the flow diagrams for wet and dry process of manufacture of cement and explain the same. 5M
6. Define the term "Bulking of aggregates". Explain its significance with reference to concrete making. Explain the simple field test to determine the bulking of aggregates. 5M
7. a. What do you mean by soundness of aggregate? 5M
   b. What is alkali-aggregate reaction? And how will it affect the concrete properties. 5M
8. a. How do you conduct sieve analysis on coarse aggregate in laboratory? 5M
   b. Differentiate between gap grading and well grading of aggregates. 5M
8. a. Bring out the detailed classification of aggregates and explain each one of them briefly 5M
   b. Explain different methods of measurement of moisture content of aggregates. 5M
10. a. What is the function of gypsum in the manufacture of cement? 2M
    b. What is Sulphate attack? 2M
    c. What are pozzolonas? 2M
    d. What is known as clinker? 2M
    e. Difference between quick setting and rapid hardening cement. 2M

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UNIT –II

1. Explain in detail the slump test with the help of a neat sketch. Discuss its merits and limitations. 10M
2. a. What do you understand by the term "Workability"? 5M
   b. Discuss the various factors affecting the workability of concrete. 5M
3. Explain the following with reference to the properties of fresh concrete. 10M
   a. Segregation b. Bleeding.
4. Explain about different methods to measure workability of concrete? 10M
5. Briefly explain manufacturing procedure of concrete. 10M
6. a. Explain the phenomenon of gain of strength of concrete with age. 5M
   b. Calculate the Gel/space ratio and the theoretical strength of a sample of concrete made with 500 gms of cement and 0.6 w/c ratio, on Full hydration and 70% hydration. 5M
7. Explain the various factors affecting strength of hardened concrete. 10M
8. a. Explain the Maturity concept for strength development of concrete. 5M
   b. Explain the relation between compression strength and tensile strength of concrete. 5M
9. a. Explain different methods of placing concrete. 5M
   b. Explain different methods of curing procedure. 5M
10. a. Define bleeding. 2M
    b. Define Segregation. 2M
    c. Define workability. 2M
    d. List the different factors affecting workability. 2M
    e. Write different mechanical properties of concrete. 2M

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UNIT –III

1. a. Explain Schmidt's Rebound Hammer test and the limitations and applications of the same. 5M
   b. Explain the various pulse velocity methods and the techniques measuring the pulse velocity through concrete. 5M
2. a. What are the various factors affecting the compressive strength of concrete? 5M
   b. Explain in detail about the rebound hammer test (NDT) that is conducted on existing structure to assess its strength with a neat diagram. 5M
3. Explain Creep of concrete and relation between creep and time. 10M
4. a. How the shrinkage of concrete is classified and explain each one of them briefly? 5M
   b. Explain the procedure to conduct Modulus of elasticity test in the laboratory and explain the various factors affecting the modulus of elasticity. 5M
5. a. Draw the typical stress-strain curve of concrete and explain the various modulus of elasticity. 5M
   b. Draw the stress-strain curves for aggregate, cement paste and concrete and explain the behavior for each of them. 5M
6. a. What is shrinkage of concrete? 5M
   b. Explain the various factors affecting shrinkage of concrete. 5M
7. a. What are the factors that affect the creep and shrinkage of concrete? 5M
   b. How does strength of concrete influence the modulus of elasticity and Poisson's ratio of concrete? 5M
8. Explain the procedure for UPV and Rebound hammer test. 10M
9. Explain detail about NDT. 10M
10. a. List out the factors affecting the results of strength test. 2M
    b. Define Creep. 2M
    c. Define Shrinkage. 2M
    d. List out different tests in NDT. 2M
    e. Define Dynamic modulus of Elasticity. 2M

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UNIT –IV

1. Design a concrete mix of M20 grade for a roof slab. Take a standard deviation of 4MPa. The specific gravities of Coarse Aggregate and Fine Aggregate are 2.67 and 2.73 respectively. The bulk density of coarse aggregate is 16020 Kg/m^3 and Fineness Modulus of Fine Aggregate is 2.76. A slump of 50mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 3%. Design the concrete mix using ACI method. Assume any missing data suitably. 10M
2. Explain the mix design procedure of concrete as per ACI code Method. 10M
3. Design a M35 concrete mix using IS method of Mix Design for the following data: 10M
   1) Maximum size of aggregate - 20mm (Angular)
   2) Degree of workability - 0.90 compaction factor.
   3) Quality control - good
   4) Type of exposure - mild
   5) Specific Gravity A. Cement - 3.12 (B. Sand - 2.63 (C. Coarse aggregate - 2.66
   6) Water absorption: A. Coarse aggregate - 0.5% (B. Fine aggregate - 1.0%
   7) Free surface moisture: (A. Coarse aggregate - Nil (B. Fine aggregate - 2.2%
   8) Sand confirms to Zone I grading.
   Assume any other data required suitably. 10M
4. Design a M30 concrete mix using IS method of Mix Design for the following data:
   1) Maximum size of aggregate - 20mm (Angular).
   2) Degree of workability - 0.90 compaction factor.
   3) Quality control - good
   4) Type of exposure - severe
   5) Specific Gravity: A. Cement - 3.10 B. Sand - 2.68 C. Coarse aggregate - 2.69
   6) Water absorption: A. Coarse aggregate -1.0% B. Fine aggregate - 2.0%
   7) Free surface moisture: A. Coarse aggregate- Nil B. Fine aggregate- 2.0%
   8) Sand confirms to zone III grading.
   Assume any other data required suitably 10M

5. Design a M40 concrete mix using IS method of Mix Design for the following data:
   1) Maximum size of aggregate - 20mm (Angular).
   2) Degree of workability - 0.90 compaction factor.
   3) Quality control - good
   4) Type of exposure - severe
   5) Specific Gravity: A. Cement - 3.15 B. Sand - 2.68 C. Coarse aggregate - 2.71
   6) Water absorption: A. Coarse aggregate -1.0% B. Fine aggregate - 2.0%
   7) Free surface moisture: A. Coarse aggregate- Nil B. Fine aggregate- 2.0%
   8) Sand confirms to zone III grading.

   Assume any other data required suitably 10M

6. a. Define the term "Mix Design of Concrete" and explain its significance. 5M
   b. Briefly discuss various methods of the mix design available in literature. 5M
7. Brief explain about factors affecting choice of mix design. 10M
8. Explain quality control of concrete and durability of concrete. 10M
9. Explain the mix design procedure of concrete as per IS code Method. 10M
10. a. What are the data used for ACI 2M
    b. Define workability. 2M
    c. How is mixing operation is done in concrete. 2M
    d. List out the requirements of fresh concrete. 2M
    e. List out the usage of slump values 2M

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QUESTION BANK (DESCRIPTIVE)

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Year & Sem: III B.Tech & I Sem **Regulation:** R16

UNIT-V

1.	a. What is light weight concrete? How is it produced?	4M
	b. What are the light weight aggregate concrete?	3M
	c. Explain workability scenario in light weight aggregate concrete?	3M
2.	Explain i) Cellular concrete ii) No-fineness concrete	5M
	iii)High density concrete iv) Fibre Reinforced concrete	5M
3.	a. What are different types of fibres used in the production of Fibre Reinforced concrete?	5M
	b. With respect Fibre Reinforced concrete explain following terms.	5M
	i) Aspect ratio ii) Percentage volume of fibre	
4.	a. What are various factors affecting properties of Fibre Reinforced concrete?	5M
	b. Write applications of Fibre Reinforced concrete?	5M
5.	a. Explain polymer concrete?	5M
	b. Explain types of polymer concrete?	5M
6.	a. Explain properties of polymer concrete?	5M
	b. Explain application of polymer concrete?	5M
7.	Explain high performance concrete and what are the advantages of high performance concrete over conventional concrete?	10M
8.	What is self-consolidating concrete? What are the materials used for SCC?	10M
9.	Explain self-healing concrete and bacterial concrete?	5M
10.	a. List some of the artificial light weight aggregate	2M
	b. Define light weight concrete.	2M
	c. Define high performance concrete	2M
	d. Define Admixtures	2M
	e. List different materials used for self-healing concrete.	2M

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QUESTION BANK (OBJECTIVE)

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Year & Sem: III B.Tech & I Sem **Regulation:** R16

UNIT –I

1. For quality control of Portland cement, the test essentially done is [ ]
   A. setting time B. Soundness C. tensile strength D. All the above
2. Lower the normal consistency value, [ ]
   A. Lower will be the strength of concrete B. Medium will be the strength of concrete
   C. Higher will be the strength of concrete D. None of the above
3. Under normal conditions using an ordinary cement, the period of removal of the form work, is: [ ]
   A. 7 days for beam soffits B. 14 days for bottom slabs of spans 4.6 m and more
   C. 21 days for bottom beams over 6 m spans D. All The Above
4. The mixture of different ingredients of cement, is burnt at [ ]
   A. 1000°C B. 1200°C C. 1400°C D. 1900°C
5. Hydration of cement is due to chemical action of water with [ ]
   A. Tricalcium silicate and dicalcium silicate
   B. Dicalcium silicate and tricalcium aluminate
   C. Tricalcium aluminate and tetra calcium alumino ferrite D. All the above.
6. The size of vicat needle, used to conduct setting of cement is [ ]
   A. 10mm Dia B. 1mm Square C. 3mm Square D. 10 mm Dia
7. To obtain cement dry powder, lime stones and shales or their slurry, is burnt in a rotary kiln at a temperature between [ ]
   A. 1100° and 1200°C B. 1200° and 1300°C C. 1300° and 1400°C D.1400° and 1500°C
8. Workability improved by adding [ ]
   A. air-entraining agent B. foaming agent C. oily-agent D. all the above
9. The commonly used material in the manufacture of cement is
   A. sand stone B. Slate C. lime stone D. graphite.
10. Pick up the correct proportions of chemical ingredients of cement [ ]
    A. Lime: Silica: Alumina: Iron oxide: 63: 22: 6: 3
    B. Silica: Lime: Alumina: Iron oxide: 63: 22: 6: 3
    C. Alumina: Silica: Lime: Iron oxide: 63: 22: 6: 3
    D. Iron oxide: Alumina: Silica: Lime: 63: 22: 6: 3
11. The high strength of rapid hardening cement at early stage, is due to its [ ]
    A. finer grinding B. burning at high temperature
    C. increased lime cement D. higher content of tricalcium.
12. Vicat's apparatus is used for [ ]
    A. fineness test B. consistency test C. setting time test D. B and C
13. The rock which is not calcareous, is: [ ]
    A. lime stone B. Macl C. Chalk D. Laterite

14. 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

15. Fine aggregates are the aggregates having the size less than: [ ]
A. 5mm B. 4.75mm C. 3.50mm D. 2mm

16. Choose the correct answer [ ]
A. Cement color should not be greenish
B. Smooth and gritty feeling when feel between the fingers
C. The cement should not float when thrown in a bucket full of water
D. None of the above

16. The resistance of an aggregate to compressive forces is known as [ ]
A. Crushing strength B. Impact value C. Shear resistance D. None of the above

17. For the improvement of workability of concrete, the shape of aggregate recommended is
A. Angular B. Round C. Flaky D. Irregular

18. Determination of Moisture Content of aggregate by [ ]
A. Drying method B. Displacement method
C. Calcium Carbide method D. All of the above.

19. Factors which promote alkali aggregate reaction are [ ]
A. Reactive type of aggregate B. High alkali content
C. Availability of Moisture D. All the above

20. In concrete the fine aggregates is used to [ ]
A. Fill up the voids in cement B. Fill up the voids in coarse aggregate
C. Fill up the voids in sand D. All the above

21. In Shape Test, the dimension of thickness gauge is calculated as [ ]
A. 2.4 times the average of the size of retained and passing Sieve
B. 1.2 times the average of the size of retained and passing Sieve
C. 0.6 times the average of the size of retained and passing Sieve
D. 1.8 times the average of the size of retained and passing Sieve

22. Concrete is strong in [ ]
A. Compression B. Tension C. Buckling D. Flexure

23. In an ordinary portland cement, the composition of lime is [ ]
A. 50% B. 63% C. 21% D. 33%

24. In concrete the material used as a fine aggregate is [ ]
A. Cement B. Sand C. jelly D. Gypsum

25. Shrinkage of concrete develops [ ]
A. spalling in concrete B. bends in concrete
C. cracks in concrete D. Voids in concrete

26. In concrete cube test, the standard size of cube is [ ]
A. 15 cm x 15 cm x 15 cm B. 10 cm x 10 cm x 10 cm
C. 25 cm x 25 cm x 25 cm D. None

27. Approximate percentage range of CaO in OPC is _____ [ ]
A.50-60 B. 17- 25 C. 60 -67 D. 3- 8

28. Approximate percentage range of Al_2O_3 in OPC is _____ [ ]
A.17-25 B. 3-8 C. 3- 10 D. 4-15

29. Approximate percentage of SIO_2 in OPC is _____ [ ]

A.50-60 B. 17- 25 C. 60 -67 D. 3- 8

30. _____ number of grades available in OPC [ ]
A.1 B. 2 C. 3 D. None

31. Which compound is liberates higher heat _____ [ ]
A.C_3S B. C_2S C. C_3A D. C_4AF

32. Which compound is liberates lower heat _____ [ ]
A.C_3S B. C_2S C. C_3A D. C_4AF

33. In M20 concrete M refers to _____ [ ]
A. Minimum B. Maximum C. Mix proportion D. None

34. At an early age greater strength contribute compound is _____ [ ]
A.C_3S B. C_2S C. C_3A D. C_4AF

35. The role of gypsum in cement is _____ [ ]
A. Accelerate setting process B. Retard setting process C. No affects D. None

36. Least strength contributes compounds is_____ [ ]
A.C_3S B. C_2S C. C_3A D. C_4AF

37. The size of the coarse aggregate is more than _____ [ ]
A.1.16 mm B. 2.36 mm C. 4.75 mm D. None

38. The minimum 28 days' compressive strength of 43 grade cement is _____ [ ]
A.23 MPa B. 33 MPa C. 40 MPa D. 43 MPa

39. The easiness of handling concrete is known as _____ [ ]
A. Workability B. Consistency C. Hardness D. None

40. Device which is used to find out normal consistency of cement is _____ [ ]
A. Le – Chatelier B. Permeability apparatus C. Vicat apparatus D. None

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UNIT –II

1. In rich mixes; use of ___size aggregate gives better results. [ ]
   A. Larger B. Medium C. Smaller D. None
2. For given water content, workability decreases if the concrete aggregates contain an excess of [ ]
   A. thin particles B. elongated particles C. flaky particles D. all the above
3. For ensuring quality of concrete, use [ ]
   A. single sized aggregates B. two sized aggregate
   C. graded aggregates D. coarse aggregates
4. The standard sand now a days used in India, is obtained from [ ]
   A. Jaipur B. Jullundur C. Hyderabad D. Ennore
5. The maximum amount of dust which may be permitted in aggregates is
   A. 5% of the total aggregates for low workability with a coarse grading
   B. 10% of the total aggregates for low workability with a fine grading
   C. 20% of the total aggregates for a mix having high workability with fine grading
   D. all the above.
6. The bulk density of aggregates does not depend upon: [ ]
   A. size and shape of aggregates B. specific gravity of aggregates
   C. grading of aggregates D. size and shape of the container
7. An aggregate is said to be flaky if its least dimension is less than [ ]
   A. 1/5th of mean dimension B. 2/5th of mean dimension
   C. 3/5th of mean dimension D. 4/5th of mean dimension
8. To ensure constant moisture content in aggregates [ ]
   A. height of each aggregate pile should not exceed 1.50 m
   B. aggregate pile should be left for 24 hours before aggregates are used
   C. conical heaps of aggregates should be avoided to prevent moisture variation
   D. all the above
9. For the construction of cement concrete floor, the maximum permissible size of fine aggregate, is [ ]
   A. 4.75 mm B. 6.23 mm C. 8.12 mm D. 10.50 mm
10. The process of proper and accurate measurement of concrete ingredients for uniformity of proportion, is known [ ]
    A. grading B. Curing C. Mixing D. Batching
11. Pick up the correct statement from the following: [ ]
    A. Insufficient quantity of water makes the concrete mix harsh
    B. Insufficient quantity of water makes the concrete unworkable

C. Excess quantity of water makes the concrete segregated
D. All the above

12. Slump test is done for [ ]
A. clay B. Sand C. lime D. concrete

13. Pick up the correct statement from the following: [ ]
A. The weight of ingredients of concrete mix, is taken in kilograms
B. Water and aggregates are measured in litres
C. 20 bags of cement make one tonne
D. All the above

14. Concrete mainly consists of [ ]
A. cement B. Aggregates C. Admixture D. all the above

15. Workability of concrete is measured by [ ]
A. Vicat apparatus test B. Slump test
C. Minimum void method D. Talbot Richard test

16. Internal friction between the ingredients of concrete, is decreased by using [ ]
A. less water B. fine aggregates
C. rich mix D. more water and coarse aggregates

17. The property of separation of cement paste from concrete while placing the concrete is called [ ]
A. Compaction B. Segregation C. Bleeding D. Shrinkage

18. To prevent segregation, the concrete should not be thrown from a height of more than [ ]
A. 0.25m B. 0.5m C. 1.0m D. 1.5m

19. Factors affecting Workability of concrete [ ]
A Water Content B Mix Proportions
C Size, Shape &Surface structure D All of the above

20. Separation of the constituent materials of concrete is [ ]
A Segregation B Bleeding C Workability D Vibration

21. The height of the slump cone apparatus will be [ ]
A 20cm B 25cm C 30cm D 35cm

22. Wp and Wf are the weights of a cylinder containing partially compacted and fully compacted concrete. If the compaction factor is $\left(\frac{W_P}{W_F}\right)$ 0.95, the workability of concrete is [ ]
A. extremely low B. very low C. Low D. High

23. The risk of segregation is more for [ ]
A. wetter mix B. larger proportion of maximum size aggregate
C. coarser grading D. all the above

24. The increased cohesiveness of concrete, makes it [ ]
A. less liable to segregation B. more liable to segregation
C. more liable to bleeding D. more liable for surface scaling in frosty weather

25. Workability improved by adding [ ]
A. air-entraining agent B. foaming agent C. oily-agent D. all the above

26. Proper proportioning of concrete, ensures [ ]
A. desired strength and workability B. desired durability
C. water tightness of the structure D. all the above

27. Curing [ ]
A. reduces the shrinkage of concrete B. preserves the properties of concrete
C. prevents the loss of water by evaporation D. all of the above

28. While compacting the concrete by a mechanical vibrator, the slump should not exceed [ ]
A. 2.5 cm B.5.0 cm C. 7.5 cm D. 10 cm

29. Curing a concrete for long period ensures better [ ]
A. volume stability B. Strength C. water resistance D. all the above

30. The factor which affects the design of concrete mix is [ ]
A fineness modulus B water – cement ratio
C slump D all the above

31. Commonly employed test for measurement of cement workability is _____ [ ]
A. Slump test B. Kelley bell test C. Vee Bee consists meter D. All

32. Factors effecting the design of concrete mix is [ ]
A fineness modulus B w/c C slump D all

33. Stripping time of vertical formwork to columns, walls and beams [ ]
A 16-24 hrs B 12-16 hrs C 10-12 hrs D 8-10 hrs

34. In case of workable mixes, as per the Abrams Law the strength of concrete
A Depends on water/cement ratio B Independent of water/cement ratio [ ]
C Decreases with water/cement ratio D None of the above

35. As per IS Code method, the water cement ratio is calculated from [ ]
A Target mean strength B Cement type C Both a and b D None

36. In order to make concrete durable, the water cement ratio should be [ ]
A High B Low C Moderate D None

37. Shrinkage in concrete can be reduced by using [ ]
A. low water cement ratio B. less cement in the concrete
C. Both A & B D. None of the above

38. In M20 Grade concrete , 20 indicates [ ]
A. Compressive strength B. Tensile strength C. Mix D. None

39. Hardening of cement occurs at [ ]
A. rapid rate during the first few days and afterwards it continues to increase at a decreased rate
B. slow rate during the first few days and afterwards it continues to increase at a rapid rate
C. uniform rate throughout its age
D. none of these

40. Effect of time on concrete workability is _____ [ ]
A. Increase workability as time passes B. Decrease workability as time passes
C. No effect D. None

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UNIT – III

1. To produce impermeable concrete [ ]
   A. properly graded and non-porous aggregates are required
   B. proper compaction of concrete is required
   C. Both A & B D. None of the Above
2. Identify the incorrect statement [ ]
   A. The testing of representative concrete does not give the quality of actual in-place concrete.
   B. Quality control can be exercised by testing three concrete cubes at 28 days
   C. The quality control is carried out much before any cube becomes available for testing
   D. None of the above
3. The concept of performance oriented specifications suffers due to difficulty in
   A. Defining what constitutes satisfactory performance
   B. Setting appropriate performance limits
   C. All the above
   D. None of the above
4. Which of the fallowing statements are incorrect?
   A. uniform workability ensures uniform strength
   B. The ball penetration test can be performed on concrete as placed in the forms
   C. Both A & B
   D. Vee-bee test is suitable for low and very low workability's
5. The permissible variation in compacting factor measurement is
   A. ±25mm B. One-third of the required value
   C. 0.07 for C.F. values below 0.7 D. None of the above
6. The cement content in a sample of fresh concrete can be determined by
   A. rapid analysis machine B. EDTA titration method
   C. accelerated strength method D. None of the above
7. The quality and strength of concrete in a structure can be assessed by
   A. The concrete core test B. The pull out test
   C. The Schmidt test hammer D. All the above
8. In ultrasonic test for hardened concrete good quality of concrete is indicated if the pulse velocity is
   A. below 3 km/s B. above 3.5 km/s
   C. Above 4.5 km/s D. None of the above
9. Specified compressive strength of concrete is obtained from cube tests at the end of
   A. 3 days B. 7 days C. 14 days D. 28 days
10. Slump test of concrete is a measure of its
    A. consistency B. compressive strength C. tensile strength D. impact value.

11. If the engineer-in-charge approves, the 10 cm cubes may be used for the work test of concrete provided maximum nominal size of aggregate, does not exceed
    A. 10 mm B. 15 mm C. 20 mm D. 25 mm
12. Pick up the incorrect statement applicable to the field test of good cement.
    A. When one thrusts one's hand into a bag of cement, one should feel warm
    B. The colour of the cement is bluish
    C. A handful of cement thrown into a bucket of water should sink immediately
    D. All the above
13. An ordinary Portland cement when tested for its fineness, should not leave any residue on I.S. sieve No. 9, more than
    A. 5% B. 10% C. 15% D. 20%
14. The top diameter, bottom diameter and the height of a slump mould are:
    A. 10 cm, 20 cm, 30 cm B. 10 cm, 30 cm, 20 cm
    C. 20 cm, 10 cm, 30 cm D. 20 cm, 30 cm, 10 cm
15. Workability of concrete mix with low water cement ratio is determined by
    A. tensile strength test B. slump test
    C. compaction factor test D. none of these
16. Pick up the incorrect statement from the following. For performing compressive strength test of cement
    A. cement and standard sand mortar are used in the ratio of 1: 3
    B. water is added at the rate of + 3.0 percentage of water where P is the percentage of water for standard consistency
    C. A cube mould of 10 cm x 10 cm x 10 cm is used
    D. None of the above
17. The lower water cement ratio in concrete, introduces
    A. smaller creep and shrinkage B. greater density and smaller permeability
    C. improved frost resistance D. all the above.
18. Separation of coarse aggregates from mortar during transportation, is known
    A. bleeding B. Creeping C. Segregation D. Shrinkage
19. Separation of water or water sand cement from a freshly concrete, is known
    A. bleeding B. Creeping C. Segregation D. Shrinkage
20. Shrinkage in concrete can be reduced by using
    A. low water cement ratio B. less cement in the concrete
    C. proper concrete mix D. None
21. Pick up the correct statement from the following:
    A. According to the petrological characteristics, concrete aggregates are classified as heavy weight, normal weight and light weight
    B. According to the shape of the particles, concrete aggregates are classified as rounded irregular, angular and flaky
    C. According to the surface texture of the particles, the concrete aggregates are classified as glassy, smooth, granular, rough, crystalline, honey combed and porous
    D. All the above.
22. The ratio between stress in steel to that of stress in concrete in expressed as [ ]
    A. Poisson's ratio B. Modular ratio C. Density ratio D. None

23. Select the Non – destructive test among the following [ ]
A. Compression test B. Flexure test C. Rebound hammer test D. All the above

24. The process of selecting suitable ingredients of concrete and determining their relative quantities can be called as [ ]
A. Mix design B. Specific gravity C. Compressive strength D. None

25. Modulus of rupture of concrete is a measure of _____strength [ ]
A. Split tensile B. Compressive C. Direct tensile D. Flexural tensile

26. According to IS 456-2000, the modulus of elasticity of concrete Ec, can be taken as _ [ ]
A. Ec = 570√fck B. 5700 fck C. 5700√fck D. 5000√fck

27. Increase in the moisture content in concrete _____ [ ]
A. Reduces the strength B. Increases the strength
C. Does not change the strength D. All the above

28. Modulus of elasticity of steel as per IS : 456—2000 shall be taken as _____ [ ]
A. 20kN/cm^2 B. 200kN/cm^2 C. 200kN/mm^2 D. 2 X 106N/cm^2

29. The factor of safety for concrete _____ than steel [ ]
A. Lower B. Higher C. Equal D. None

30. According to Indian standards the grading of fine aggregate is divided into _____ [ ]
A. Two zones B. Four zones C. Five zones D. Three zones

31. With the increase in rate of loading during testing compressive strength of concrete [ ]
A. Increases B. Decreases C. Remains same D. None

32. To determine the modulus of rupture the size of test specimen used is _____ [ ]
A. 150 X 150 X 500mm B. 100 X 100 X 700mm C. 150 X 150 X 700mm D. None

33. The ratio between stress in steel to that of stress in concrete in expressed as __ [ ]
A. Poisson's ratio B. Modular ratio C. Density ratio D. None

34. Select the Non – destructive test among the following _____ [ ]
A. Compression test B. Flexure test C. Rebound hammer test D. All the above

35. The process of selecting suitable ingredients of concrete and determining their relative quantities can be called as [ ]
A. Mix design B. Specific gravity C. Compressive strength D. None

36. The formula for determining the cement content is given by _____ [ ]
A. W/C ratio/ water content B. Water content /W/C ratio
C. Cement / W/C ratio D. All the above

37. According to India standards the coarse aggregate should conform to _____ [ ]
A. IS: 383 -70 B. IS: 381-70 C. IS: 382 -70 D. None

38. Standard deviation can be calculated as [ ]
A. $S = \sum x/n$ B. $S = \sqrt{\sum(x - \bar{x})^2/n-1}$ C. $S = \sum(x - \bar{x})^2/n$ D. None

39. As per IS: 456-2000, the high strength concrete should have the characteristic

strength of _____ [ ]

A. M40 B. M35 C. M65 D. All the above

40. Maturity of concrete is the product of _____ [ ]

A. Time B. Velocity C. Time & Temperature D. None

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QUESTION BANK (OBJECTIVE)

Subject with Code : Concrete Technology (16CE118) **Course & Branch**: B.Tech - CE

Year & Sem: III B.Tech & I Sem **Regulation:** R16

UNIT –IV

1. The compaction of concrete, improves [ ]
   A. Density B. Strength C. Durability D. all the above.
2. Segregation is responsible for [ ]
   A. honey-combed concrete B. porous layers in concrete
   C. surface scaling in concrete D. sand streaks in concrete
3. Addition of pozzolana to cement [ ]
   A. decreases workability B. increases strength
   C. increases heat of hydration D. Increase workability
4. Permissible compressive strength of M 150 concrete grade is [ ]
   A. 100 kg/ cm^2 B. 150 kg/cm^2 C. 200 kg/ cm^2 D. 250 kg/cm2
5. Pozzolana cement is used with confidence for construction of [ ]
   A. dams B. massive foundations C. Abutments D. R.C.C. structures
6. Efflorescence in cement is caused due to an excess of [ ]
   A. Alumina B. iron oxide C. Magnesium Oxide D. alkalis
7. The diameter of the Vicat plunger is 10 mm and its length varies from [ ]
   A. 20 mm to 30 mm B. 30 mm to 40 mm C. 40 mm to 50 mm D. 50 mm to 60 mm
8. The ratio of various ingredients (cement, sand, aggregates) in concrete of grade M 20, is [ ]
   A. 1: 2: 4 B. 1: 3: 6 C. A & B D. None of the Above
9. Tricalcium aluminate [ ]
   A. reacts fast with water B. generates less heat of hydration
   C. causes initial setting and early strength of cement
   D. does not contribute to develop ultimate strength
10. According to Water-Cement Ratio Law, the strength of workable plastic concrete [ ]
    A. depends upon the amount of water used in the mix
    B. does not depend upon the quality of cement mixed with aggregates
    C. does not depend upon the quantity of cement mixed with aggregates
    D. all the above
11. Pick up the correct statement from the following: [ ]
    A. High percentage of C_3S and low percentage of C_2S cause rapid hardening
    B. High percentage of C_3S and low percentage of C_2S make the cement less resistive to chemical attack
    C. Low percentage of C_3S and high percentage of C_2S contribute to slow hardening
    D. None
12. The factor which affects workability, is [ ]
    A. water content and its temperature B. shape and size of the aggregates

C. grading and surface textures of the aggregates D. air entraining agents

13. The cement whose strength is a little lower than the ordinary cement during the first three months but attains afterwards the same strength, is known as [ ]
A. low-heat Portland cement B. rapid hardening Portland cement
C. Portland blast slag cement D. none of these

14. Pick up the correct statement from the following: [ ]
A. Water enables chemical reaction to take place with cement
B. Water lubricates the mixture of gravel, sand and cement
C. Only a small quantity of water is required for hydration of cement
D. Strength of concrete structure largely depends upon its workability

15. Pick up the correct statement from the following: [ ]
A. Calcium chloride acts as a retarder B. Gypsum acts as a retarder
C. Calcium chloride acts as an accelerator D. Both C. and D.

16. Joints in concrete structures, are provided [ ]
A. to reduce the tensile stresses likely to be developed due to evaporation of water
B. to minimize the change in the dimensions of the slab
C. to minimize the necessary cracking D. all the above.

17. High temperature [ ]
A. increases the strength of concrete B. decreases the strength of concrete
C. has no effect on the strength of concrete D. none of these.

18. The bulk density of aggregates, is generally expressed as [ ]
A. tonnes/cubic meter B. kg/cubic meter C. kg/liter D. g/cm3

19. The grade of concrete M 150 means that compressive strength of a 15 cm cube after 28 days, is [ ]
A. 100 kg/cm2 B. 150 kg/cm2 C. 200 kg/cm2 D. 250 kg/cm2

20. According to IS 456-2000, the modulus of elasticity of concrete Ec, can be taken as [ ]
A. Ec = 570√fck B. 5700 fck C. 5700√fck D. 5000√fck

21. Increase in the moisture content in concrete _____ [ ]
A. Reduces the strength B. Increases the strength
C. Does not change the strength D. All the above

22. Modulus of rupture of concrete is a measure of _____ [ ]
A. Split tensile strength B. Compressive strength
C. Direct tensile strength D. Flexural tensile strength

23. The relation between modulus of rupture for and characteristic strength of concrete fck is given by __ [ ]
A. fcr = 1.2√fck B. fcr = 0.7√fck C. fcr = 0.35√fck D. 0.5√fck

24. Modulus of elasticity of steel as per IS: 456—2000 shall be taken as [ ]
A. 20kN/cm^2 B. 200kN/cm^2 C. 200kN/mm^2 D. 2 X 106N/cm^2

25. The factor of safety for concrete _____ than steel [ ]
A. Lower B. Higher C. Equal D. None

26. The ratio of various ingredients (cement, sand, aggregates) in concrete of grade M 15, [ ]
A. 1: 2: 4 B. 1: 3: 6 C. A & B D. None of the Above

27. According to Indian standards the grading of fine aggregate is divided into _____ [ ]
A. Two zones B. Four zones C. Five zones D. Three zones

28. With the increase in rate of loading during testing compressive strength of concrete _ [ ]
A. Increases B. Decreases C. Remains same D. None
29. To determine the modulus of rupture the size of test specimen used is _____ [ ]
A. 150 X 150 X 500mm B. 100 X 100 X 700mm C. 150 X 150 X 700mm D. None
30. The ratio between stress in steel to that of stress in concrete in expressed as [ ]
A. Poisson's ratio B. Modular ratio C. Density ratio D. None
31. Select the Non – destructive test among the following _____ [ ]
A. Compression test B. Flexure test C. Rebound hammer test D. All the above
13. The process of selecting suitable ingredients of concrete and determining their relative quantities can be called as _____ [ ]
a) Mix design B. Specific gravity C. Compressive strength D. None
32. The formula for determining the cement content is given by _____ [ ]
A. W/C ratio/ water content B. Water content /W/C ratio
C. Cement / W/C ratio D. All the above
33. According to India standards the coarse aggregate should conform to _____ [ ]
A. IS: 383 -70 B. IS: 381-70 C. IS: 382 -70 D. None
34. Standard deviation can be calculated as _____ [ ]
A. $S = \sum x/n$ B. $S = \sqrt{\sum (x - \bar{x})2/n-1}$ C. $S = \sum (x - \bar{x})2/n$ D. None
35. As per IS: 456-2000, the high strength concrete should have the characteristic strength of _____ [ ]
A. M40 B. M35 C. M65 D. All the above
36. Maturity of concrete is the product of _____ [ ]
A. Time B. Velocity C. Time & Temperature D. None
37. The characteristic strength of M50 concrete is _____ [ ]
A. 40 N/ mm2 B. 60 N /mm2 C. 50 N /mm2 D. 30 N /mm2
38. The cylindrical strength of concrete is _____ times the strength of the cube [ ]
A. 10 B. 1.5 C. 0.8 D. 8
39. The ratio of various ingredients (cement, sand, aggregates) in concrete of grade M 25, [ ]
A. 1: 1: 2 B. 1: 3: 6 C. A & B D. None of the Above
40. The ratio of various ingredients (cement, sand, aggregates) in concrete of grade M 10, [ ]
A. 1: 2: 4 B. 1: 4: 8 C. A & B D. None of the Above

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QUESTION BANK (OBJECTIVE)

Subject with Code : Concrete Technology (16CE118) **Course & Branch**: B.Tech - CE

Year & Sem: III B.Tech & I Sem **Regulation:** R16

UNIT – V

1. The characteristic strength of M_{50} concrete is _____ [ ]
   A. 40 N/ mm^2 B. 60 N /mm^2 C. 50 N /mm^2 D. 30 N /mm^2
2. The cylindrical strength of concrete is _____ times the strength of the cube [ ]
   A. 10 B. 1.5 C. 0.8 D. 8
3. Wp and Wf are the weights of a cylinder containing partially compacted and fully compacted concrete. If the compaction factor is $\left(\frac{W_P}{W_f}\right)$ 0.95, the workability of concrete is [ ]
   A. extremely low B. very low C. Low D. High
4. The risk of segregation is more for [ ]
   A. wetter mix B. larger proportion of maximum size aggregate
   C. coarser grading D. all the above
5. The increased cohesiveness of concrete, makes it [ ]
   A. less liable to segregation B. more liable to segregation
   C. more liable to bleeding D. more liable for surface scaling in frosty weather
6. Workability improved by adding [ ]
   A. air-entraining agent B. foaming agent C. oily-agent D. all the above
7. Proper proportioning of concrete, ensures [ ]
   A. desired strength and workability B. desired durability
   C. water tightness of the structure D. all the above
8. Curing [ ]
   A. reduces the shrinkage of concrete B. preserves the properties of concrete
   C. prevents the loss of water by evaporation D. all of the above
9. While compacting the concrete by a mechanical vibrator, the slump should not exceed [ ]
   A. 2.5 cm B.5.0 cm C. 7.5 cm D. 10 cm
10. Curing a concrete for long period ensures better [ ]
    A. volume stability B. Strength C. water resistance D. all the above
11. The factor which affects the design of concrete mix is [ ]
    A fineness modulus B water – cement ratio
    C slump D all the above
12. Commonly employed test for measurement of cement workability is _____ [ ]
    A. Slump test B. Kelley bell test C. Vee consists meter D. All
13. Slump test is done for [ ]
    A. clay B. Sand C. lime D. concrete

14. Pick up the correct statement from the following: [ ]
    A. The weight of ingredients of concrete mix, is taken in kilograms
    B. Water and aggregates are measured in liters
    C. 20 bags of cement make one tonne D. All the above
15. Concrete mainly consists of [ ]
    A. cement B. Aggregates C. Admixture D. all the above
16. Workability of concrete is measured by [ ]
    A. Vicat apparatus test B. Slump test
    C. Minimum void method D. Talbot Richard test
17. Internal friction between the ingredients of concrete, is decreased by using [ ]
    A. less water B. fine aggregates
    C. rich mix D. more water and coarse aggregates
18. The property of separation of cement paste from concrete while placing the concrete is called [ ]
    A. Compaction B. Segregation C. Bleeding D. Shrinkage
19. To prevent segregation, the concrete should not be thrown from a height of more than [ ]
    A. 0.25m B. 0.5m C. 1.0m D. 1.5m
20. Factors affecting Workability of concrete [ ]
    A Water Content B Mix Proportions
    C Size, Shape &Surface structure D All of the above
21. The compaction of concrete, improves [ ]
    A. Density B. Strength C. Durability D. all the above.
22. Segregation is responsible for [ ]
    A. honey-combed concrete B. porous layers in concrete
    C. surface scaling in concrete D. All the above
23. Addition of pozzolana to cement [ ]
    A. decreases workability B. increases strength
    C. increases heat of hydration D. Increase workability
24. Permissible compressive strength of M 150 concrete grade is [ ]
    A. 1000 kg/ cm^2 B. 1500 kg/cm^2 C. 2000 kg/ cm^2 D. 2500 kg/cm^2
25. Pozzolana cement is used with confidence for construction of [ ]
    A. dams B. massive foundations C. Abutments D. R.C.C. structures
26. Efflorescence in cement is caused due to an excess of [ ]
    A. Alumina B. iron oxide C. Magnesium Oxide D. alkalis
27. The diameter of the Vicat plunger is 10 mm and its length varies from [ ]
    A. 20 mm to 30 mm B. 30 mm to 40 mm C. 40 mm to 50 mm D. 50 mm to 60 mm
28. Tricalcium aluminate [ ]
    A. reacts fast with water B. generates less heat of hydration
    C. causes initial setting and early strength of cement
    D. does not contribute to develop ultimate strength
29. According to Water-Cement Ratio Law, the strength of workable plastic concrete [ ]
    A. depends upon the amount of water used in the mix
    B. does not depend upon the quality of cement mixed with aggregates
    C. does not depend upon the quantity of cement mixed with aggregates D. all the above

30. Pick up the correct statement from the following: [ ]
A. High percentage of C_3S and low percentage of C_2S cause rapid hardening
B. High percentage of C_3S and low percentage of C_2S make the cement less resistive to chemical attack
C. Low percentage of C_3S and high percentage of C_2S contribute to slow hardening
D. None

31. The factor which affects workability, is [ ]
A. water content and its temperature B. shape and size of the aggregates
C. grading and surface textures of the aggregates D. All the above

32. The cement whose strength is a little lower than the ordinary cement during the first three months but attains afterwards the same strength, is known as [ ]
A. low-heat Portland cement B. rapid hardening Portland cement
C. Portland blast slag cement D. none of these

33. Pick up the correct statement from the following: [ ]
A. Water enables chemical reaction to take place with cement
B. Water lubricates the mixture of gravel, sand and cement
C. Only a small quantity of water is required for hydration of cement
D. Strength of concrete structure largely depends upon its workability

34. Pick up the correct statement from the following: [ ]
A. Calcium chloride acts as a retarder B. Gypsum acts as a retarder
C. Calcium chloride acts as an accelerator D. Both C. and D.

35. Joints in concrete structures, are provided [ ]
A. to reduce the shrinkage cracks likely to be developed due to evaporation of water
B. to minimize the change in the dimensions of the slab
C. to minimize the necessary cracking D. all the above.

36. High temperature [ ]
A. increases the strength of concrete B. decreases the strength of concrete
C. has no effect on the strength of concrete D. none of these.

37. The bulk density of aggregates, is generally expressed as [ ]
A. tonnes/cubic meter B. kg/cubic meter C. kg/liter D. g/cm^3

38. Determination of Moisture Content of aggregate by [ ]
A. Drying method B. Displacement method
C. Calcium Carbide method D. All of the above.

39. Factors which promote alkali aggregate reaction are [ ]
A. Reactive type of aggregate B. High alkali content
C. Availability of Moisture D. All the above

40. In concrete the fine aggregates is used to [ ]
A. Fill up the voids in cement B. Fill up the voids in coarse aggregate
C. Fill up the voids in sand D. All the above

41. To produce impermeable concrete [ ]
A. properly graded and non-porous aggregates are required
B. proper compaction of concrete is required
C. Both A & B D. None of the Above

42. Identify the incorrect statement [ ]
A. The testing of representative concrete does not give the quality of actual in-place concrete.
B. Quality control can be exercised by testing three concrete cubes at 28 days
C. The quality control is carried out much before any cube becomes available for testing
D. None of the above

43. The concept of performance oriented specifications suffers due to difficulty in [ ]
A. Defining what constitutes satisfactory performance
B. Setting appropriate performance limits
C. All the above
D. None of the above

44. Which of the fallowing statements are incorrect? [ ]
A. uniform workability ensures uniform strength
B. The ball penetration test can be performed on concrete as placed in the forms
C. Both A & B
D. Vee-bee test is suitable for low and very low workability's

45. The permissible variation in compacting factor measurement is [ ]
A. ±25mm B. One-third of the required value
C. 0.07 for C.F. values below 0.7 D. None of the above

46. The cement content in a sample of fresh concrete can be determined by [ ]
A. rapid analysis machine B. EDTA titration method
C. accelerated strength method D. None of the above

47. The quality and strength of concrete in a structure can be assessed by [ ]
A. The concrete core test B. The pull out test
C. The Schmidt test hammer D. All the above

48. In ultrasonic test for hardened concrete good quality of concrete is indicated if the pulse velocity is
A. below 3 km/s B. above 3.5 km/s
C. Above 4.5 km/s D. None of the above

49. Specified compressive strength of concrete is obtained from cube tests at the end of [ ]
A. 3 days B. 7 days C. 14 days D. 28 days

50. Slump test of concrete is a measure of its [ ]
A. consistency B. compressive strength C. tensile strength D. impact value.

51. If the engineer-in-charge approves, the 10 cm cubes may be used for the work test of concrete provided maximum nominal size of aggregate, does not exceed [ ]
A. 10 mm B. 15 mm C. 20 mm D. 25 mm

52. Pick up the incorrect statement applicable to the field test of good cement. [ ]
A. When one thrusts one's hand into a bag of cement, one should feel warm
B. The colour of the cement is bluish
C. A handful of cement thrown into a bucket of water should sink immediately
D. All the above

53. An ordinary Portland cement when tested for its fineness, should not leave any residue on I.S. sieve No. 9, more than [ ]
A. 5% B. 10% C. 15% D. 20%

54. The top diameter, bottom diameter and the height of a slump mould are: [ ]
A. 10 cm, 20 cm, 30 cm B. 10 cm, 30 cm, 20 cm

C. 20 cm, 10 cm, 30 cm D. 20 cm, 30 cm, 10 cm

55. Workability of concrete mix with low water cement ratio is determined by [ ]
A. tensile strength test B. slump test
C. compaction factor test D. none of these

56. Pick up the incorrect statement from the following. For performing compressive strength test of cement [ ]
A. cement and standard sand mortar are used in the ratio of 1: 3
B. water is added at the rate of + 3.0 percentage of water where P is the percentage of water for standard consistency
C. A cube mould of 10 cm x 10 cm x 10 cm is used
D. None of the above

57. The lower water cement ratio in concrete, introduces [ ]
A. smaller creep and shrinkage B. greater density and smaller permeability
C. improved frost resistance D. all the above.

58. Separation of coarse aggregates from mortar during transportation, is known [ ]
A. bleeding B. Creeping C. Segregation D. Shrinkage

59. Separation of water or water sand cement from a freshly concrete, is known [ ]
A. bleeding B. Creeping C. Segregation D. Shrinkage

60. Shrinkage in concrete can be reduced by using [ ]
A. low water cement ratio B. less cement in the concrete
C. proper concrete mix D. None

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