



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

QUESTION BANK (DESCRIPTIVE)

Subject with Code :Concrete Technology (13A01503)Course & Branch: B.Tech - CE Year & Sem:III-B.Tech & I-Sem Regulation: R13

UNIT –V

MIXDESIGN

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/m³ 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 (OBJECTIVE)

Subject with Code : Concrete Technology (13A01503) **Course & Branch:** B.Tech - CE **Year & Sem:** III-B.Tech & I-Sem **Regulation:** R13

UNIT- V

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/cm² B. 150 kg/cm² C. 200 kg/cm² 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 C₃S and low percentage of C₂S cause rapid hardening
B. High percentage of C₃S and low percentage of C₂S make the cement less resistive to chemical attack
C. Low percentage of C₃S and high percentage of C₂S 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 E_c , can be taken as []
A. $E_c = 570\sqrt{f_{ck}}$ B. $5700 f_{ck}$ C. $5700\sqrt{f_{ck}}$ D. $5000\sqrt{f_{ck}}$
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 f_{cr} is given by ___ []
A. $f_{cr} = 1.2\sqrt{f_{ck}}$ B. $f_{cr} = 0.7\sqrt{f_{ck}}$ C. $f_{cr} = 0.35\sqrt{f_{ck}}$ D. $0.5\sqrt{f_{ck}}$
24. Modulus of elasticity of steel as per IS: 456—2000 shall be taken as []
A. 20kN/cm² B. 200kN/cm² C. 200kN/mm² D. 2 X 106N/cm²
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 is 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
32. 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
33. 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
34. According to India standards the coarse aggregate should conform to _____ []
A. IS: 383 -70 B. IS: 381-70 C. IS: 382 -70 D. None
35. 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
36. 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
37. Maturity of concrete is the product of _____ []
A. Time B. Velocity C. Time & Temperature D. None
38. The characteristic strength of M50 concrete is _____ []
A. 40 N/ mm² B. 60 N/mm² C. 50 N/mm² D. 30 N/mm²
39. The cylindrical strength of concrete is _____ times the strength of the cube []
A. 10 B. 1.5 C. 0.8 D. 8
40. 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
41. 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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