KATHMANDU UNIVERSITY
End Semester Examination
March/April 2017

Marks scored:

Level : B.E./B.Tech.
Year : II

Course : CIEG 201
Semester: I

Roll No.:

Time : 30 mins.

F.M. : 10

APR 0 3 2017

Registration No.:

Date :

SECTION "A"
[20 Q. × 0.5=10]

Tick (√) the most appropriate answer

1. An aggregate that passes through 25 mm IS sieve and is retained on 20 mm sieve, is said to be of flaky type if its least dimension is less than
   a. 12.5 mm b. 40.5 mm c. 37.5 mm d. 13.5 mm

2. Density of Ordinary Portland Cement is
   a. 1.2-1.4 t/m^3 b. 1.4-1.5 t/m^3 c.1.5-1.6t/m^3 d.1.6-1.7 t/m^3

3. The function of C_2S is
   a. Early Strength b. Ultimate Strength c. Initial Strength d. Flash Set

4. Which of the following is a viscous residue obtained by distillation of asphaltic base crude oil?
   a. Cutback Asphalt b. Mastic Asphalt
   c. Liquid Asphalt d. Asphaltic Emulsion

5. A 20 kg Coarse aggregate is sieved through 80 mm, 40 mm, 20 mm, 10 mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 μ, 300μ & 150μ sieves. The weight retained are 0, 2 kg, 5 kg, 6 kg, & 4 kg respectively. Fineness modulus of aggregate is.....
   a. 5.30 b. 7.40 c. 6.5 d. 8.6

6. .....uses solution of Sodium Silicate and Slaked lime to improve fire resistance of timber
   a. Ascue Treatment b. Creosotes c. Abel Process d. Tarring

7. What is the gel –space ratio for: Cement =50 kg & Water=20 kg?
   a. 0.86 b. 0.91 c. 1.0 d. 1.2

8. The process by which fresh cement concrete is compacted to remove the air bubbles is called as
   a. Compaction b. Wetting c. Placing d. Consolidation

9. Workability of Concrete is inversely proportional to
   a. Water-Cement Ratio b. Air in the mix
   c. Size of Aggregate d. Time of transit

10. Mild Steel contains carbon up to
    a. 0.15 % b. 0.30% c. 0.25 % d. 0.20 %

11. Excess of lime in brick causes
    a. Melting b. Efflorescence c. Cracking d. Decolorisation

12. Knots in timber are
    a. defects caused by crushing fibers
    b. splits radiating from the center
    c. speckled strains
    d. signs of branches cutoffs

13. If the depth of moist sand in the cylinder is 15 cm and the depth of the sand with a full inundation in water is 12 cm, then the bulking of sand is
    a. 20 % b. 25 % c. 80% d. 100 %

14. Modulus of Rupture of Concrete is the measure of
    a. Flexural Tensile Strength b. Compressive Strength
    c. Direct Tensile Strength d. Bearing Strength

15. Lamination of Bricks is caused by
    a. Entrapped Air b. Excess Lime c. Entrapped Water d. Excess Sand

16. Pick up incorrect statement:
    a. The diameter of pipe line for transportation of concrete by pumps does not exceed 30 cm
    b. Slump of the concrete to be pumped should not be less than 4 cm and more
    c. Number of bents provided in the pipe line should be minimum possible
    d. W/C ratio of concrete to be pumped is kept between 0.5 to 0.65

17. Curing of pavements, floors, roofs, slabs are done by
    a. Membrane Curing b. Sprinkling Water c. Ponding d. Covering by Bags

18. The type of aggregate not suitable for high strength concrete subjected to tension is
    a. Rounded b. Uniform c. Irregular d. Flaky

19. Nominal Mix design of M20 concrete is
    a. 1:1:2 b.1:3:6 c. 1:2:4 d. 1:1.5:3

20. Specific Surface of Cement is expressed as
    a. mm^2 b. mm^2/g c. mm^2/g mm d. g/mm^2

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SECTION "B"\

Assume the suitable data wherever necessary.
Attempt ***ALL*** Questions.

1. Explain various forms of brick. Explain manufacturing of a brick. Describe various qualities of a good brick. [2+2+2=6]

2. What is Cutback bitumen? Discuss on the different defects of the Timber with illustration? [2+4=6]

3. Enumerate various types of Admixtures.
In a sieve analysis done at lab of Kathmandu University, following result was seen. With reference to data, trace the particle size distribution curve of the sample. Use the result to calculate the coefficient of curvature & coefficient of uniformity. Also, calculate the fineness modulus of the sample. Interpret the result. [1+4=5]

Attach the semi-log graph that is provided.

Wt. retained (kg)	-	-	0.3	0.4	0.5	6.3	8.4
Sieves	Pan	150μ	300 μ	600 μ	1.18 mm	2.36 mm	4.75 mm

4. What do you mean by maturity of concrete? Relate water-cement ratio with strength & workability? Calculate the mix proportion of the Concrete by IS with following Specification. **Use Tables provided in the question.**

- Specified Strength of concrete to be M30
- Standard Deviation is 6 Good Quality M30 grade of Concrete
- Moderate Exposure: Maximum w/c ratio 0.6 (moderate exposure)
- Cement Grade 53
- Sp. Gravity of Cement 3.06
- Compacting Factor 0.70
- Good Quality Control
- C.A (Max. Size 20 mm, Sp. Gravity 2.68, Angular)
- F.A (Zone-1 Sp. Gravity 2.60)
- Air entrapped 2%
- Sand as % of Total Aggregate by Absolute volume 30%
- Water Content 186 kg/m^3
- 20 mm Nominal Max Size of Aggregate

[1+1+4=6]

5. a. Explain the micro structure of a good timber. [3]
b. What are the factors affecting creep of Concrete? List factors affecting shrinkage in Concrete? [2+1=3]

6. a. What do you mean by Workability of Fresh Concrete? Explain Compacting Factor Test to determine workability of concrete? [1+2=3]

b. Discuss various moduli of elasticity of concrete? How do you determine tensile strength of Concrete? [2+2=4]

7. Write short note on following: (*ANY TWO*) [2+2=4]
   a. Asphalts &its uses
   b. Mechanical Properties of Steel
   c. Commercial forms of Glasses

Tables to be used in Mix Design for Q.No.4:

Table 4 Adjustment of values in water content

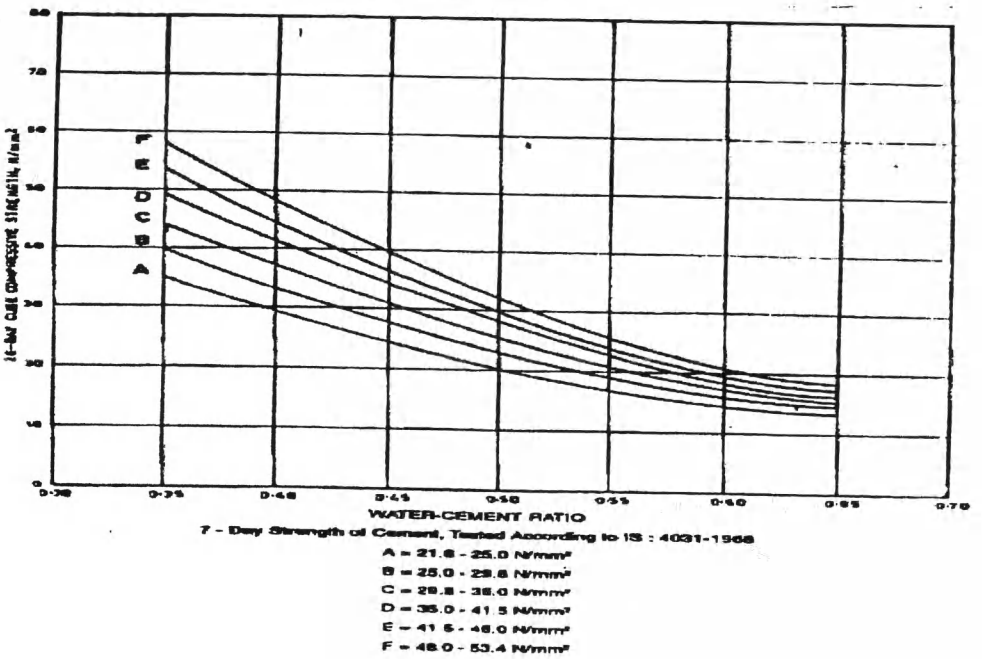
Change in condition stipulates in Table 2 and 3	Adjustment required in water content
For sand confirming To grading zone I, zone III or zone IV of IS: 383 - 1970	0
Increase or decrease in the Value of compacting factor by 0.1	± 3 percent
Each 0.05 increase or decrease in free water cement ratio	0
For rounded aggregate	-15 kg / m^3

Source: Table 6 page no 11 IS 10262-1982

Table 5: Adjustment of Values in Sand Percentage

Change in condition stipulates in Table 12	Adjustment required in sand in total aggregate
For sand confirming To grading zone I, zone III or zone IV of IS: 383 - 1970	+1.5 percent for zone I -1.5 percent for zone III -3.0 percent for zone IV
Increase or decrease in the Value of compacting factor by 0.1	0
Each 0.05 increase or decrease in free water cement ratio	± 1 percent
For rounded aggregate	-7 percent

Source: Table 6 page no 11 IS 10262-1982



7 - Day Strength of Cement, Tested According to IS : 4031-1968

A = 21.6 - 25.0 N/mm²
B = 25.0 - 29.8 N/mm²
C = 29.8 - 36.0 N/mm²
D = 36.0 - 41.5 N/mm²
E = 41.5 - 48.0 N/mm²
F = 48.0 - 53.4 N/mm²

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Attach graph with your answer