

B.Tech. Civil (Construction Management)

Term-End Examination

00353

June, 2018

ET-521(C) : DESIGN DETAILING

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Support your answers with neat sketches.

1. A doubly reinforced beam whose size is limited to 300 mm × 650 mm overall is reinforced with 5 – 18 ϕ bars in tension and 5 – 16 ϕ bars in compression. The effective span of beam is 5 m. M 20 mix and Fe 415 grade steel has been used in the design of the above beam. Draw the plan and section of the above beam showing the reinforcement details. 14

2. A reinforced concrete column 6.5 m long (effective) and 320 mm in diameter is reinforced with 8 bars of 16 mm. The column carries 5 mm diameter lateral ties as lateral reinforcement. Draw a neat dimensioned sketch showing longitudinal and transverse reinforcements with details of their spacing. M 25 mix and Fe 415 grade steel has been used in the design of the above column. 14

3. A cantilever RC retaining wall retains earth up to a height of 6 m above ground level. The foundation is 1.2 m below GL. The retained earth has a density of 15 kN/m^3 and angle of internal friction $\phi = 30^\circ$. Draw suitable dimensioned sketches showing the reinforcement provided in the wall and base slab, as may be proposed by you. 14

4. An ISMB 250 beam transfers a reaction of 125 kN and moment of 25 kNm to its welded connection with a flange of an ISHB 200 column. Draw neat sketches showing the details of the welded beam-column connection. 14

5. (a) Define the following with reference to electrical installations in buildings : $7\frac{1}{2}$

(i) Diversity factor

(ii) Tariff

(iii) Connected load

(b) Draw a typical two-legged braced column with base connection to RCC footing. $6\frac{1}{2}$

6. (a) Why is it necessary to maintain a high power factor ? Explain methods of improvement in power factor. 7

(b) Explain various types of substations. Also state the various factors that are to be considered while deciding an indoor substation. 7

7. (a) Draw the schematic diagram for a shell and tube condenser. Also explain its working. 7
- (b) Discuss the various factors influencing the ventilation requirements of a conditioned space. 7
8. Write short notes on the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Psychrometric Chart
- (b) Lighting Design
- (c) Design Concepts of RC Frames
- (d) Monolithic Construction
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