## Ways to prevent the disease COVID-19

- 1. Wash Your Hands For 20sec.
- 2. Cover Nose & Mouth When Sneezing.
- 3. Use hand sanitizer if soap and water are not available.
- 4. Avoid Crowded Places (Social Distancing)
- 5. Avoid Contact With Sick People
- 6. Stay At home
- 7. Don't visit outside unnecessarily

## **Subject: Advanced Design of Reinforced concrete structures**

Instructor: Engr. Fawad Ahmad Total Marks: 30

## Note:

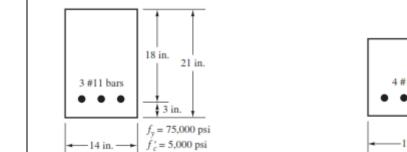
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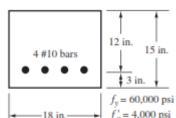
- 1. Attempt all questions. **R** is your class id.
- 2. ACI tables and values used in design must be referred while solving your design problem.
- 3. Use correct class Id R.

Q.NO (01)

A Determine the values of €t, Ø and ØMn for the sections shown below:

(10)





5

Also dissuss the strength analysis. Does the reinforcement is done according to design standard or not. Defend your design analysis.

Design a doubly reinforced beam for  $M_D = [$  **First three Digits of R**] ft-K and  $M_L = 410$  ft-K, if fc'=4000 psi and fy= 6000psi. Appropriate diagram is must in design. Assume the maximum permissible beam dimensions other than done in notes or Text book.

Q.NO (02)

A Design a short square column for the following conditions: Pu = [First three Digits of R] 10 k, Mu = [First two Digits of R] ft-k, fc' = 4000 psi, and fy = 60,000 psi.

Place the bars uniformly around all four faces of the column. Appropriate diagram is must in design.

Q.NO (03)

A Design a square column footing for a 16 inch square tied interior column that supports a dead load PD= [First three Digits of R]K and live load of PL= 160K. The column is reinforced with #8 bars the base of the footing is 5feet below, the soil weight is 100 lf/ft3, fy= 60,00 psi and fc'=3000psi and qa= [First four Digits of R]psf. Development length for main bars is also to be done in footing design.

Appropriate diagram is must in design.