B. ARCH. - 3rd Sem.

Structure Design - II

RP

Subject Code : AR-305

Paper ID : M\18

Time allowed: 3 Hrs

Max Marks: [60]

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART - A

(2 x 6 = 12)

Q 1. a) What are advantages of reinforced cement concrete construction.

b) What do you mean by effective depth of a beam.

c) Define one-way slab.

d) How will you define a short column.

e) What is a shallow foundation.

f) Under what conditions pile foundations are preferred.

PART-B

(4 x 12 = 48)

Q 2. A reinforced concrete beam is simply supported over a span of 5m and it carries uniformly distributed load of 25000 N/m including its own weight. If the size of the beam is restricted to 300 x 500 mm, determine the areas of tension and compression steel if required. Given M15 concrete and Mild Steel.

Or

A cantilever beam 3m span is to carry a superimposed load of 8000N/m. The beam has a constant cross section of 300mm x 500mm throughout. Determine the tension reinforcement if M.S. bars are to be used.

Q 3. Design a cantilever slab of 2.0m span and carrying a superimposed load of $2500N/m^2$ including finishes. Use concrete of grade M15 and Mild steel bars as reinforcement.

Or

Reinforcement concrete slabs are generally safe in shear and do not require shear reinforcement. Why?

Q 4. What are columns. What are different types of columns. Explain different IS code requirements for design of columns.

Or

Design a circular column of 8m effective height and 400mm diameter to carry an axial load of 700KN. $\sigma_{cc} = 4N/mm^2$. $\sigma_{sc} = 130N/mm^2$.

Q 5. Explain different types of foundations in detail. Explain the causes of failures of foundations.

Or

A reinforced concrete wall 150mm thick is to carry a load of 400,000N/metre run of the wall. Design the footing if the bearing capacity of the soil is $20t/m^2$.