# SCHOOL OF PLANNING AND ARCHITECTURE, VIJAYAWADA

SEMESTER END EXAMINATIONS (REGULAR) NOVEMBER - 2016

## B. ARCH IV YEAR VII SEMESTER

## THEORY OF STRUCTURES (TS-7)

**Maximum Marks – 100** **Time –3 Hours**

*a) Answer any Four out of 1 to7 questions.*
*b) Question No.8 is compulsory and answer any four out of six sub questions.*
*c) Draw neat sketches wherever necessary.*

Q1. Explain the different structural systems used in High rise buildings for varying number of storeys. **(20M)**

Q2. A pre-stressed concrete beam, 200mm wide and 300mm deep is pre-stressed with wires (area = 320mm$^2$) located at a constant eccentricity of 50mm and carrying an initial stress of 1000N/mm$^2$. The span of the beam is 10M. Calculate the percentage loss of stress in wires if the beam is pre-tensioned, using the following data: **(20M)**

$E_s = 210$ KN/mm$^2$ & $E_c = 35$ KN/mm$^2$
Relaxation of steel stress = 5% of initial stress
Shrinkage concrete = $300 \times 10^{-6}$ for pre tensioning
creep coefficient = 1.6
Slip at anchorage = 1mm
Frictional coefficient for wave effect = 0.0015/m

Q3. What do you understand by pre-stress? Explain as to how it helps the planning of long span structures. **(20M)**

Q4. Explain the general classification of shells in detail with neat sketches. **(20M)**

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Q5. Find the design load for an interior column of ground floor of a ten-storeyed building using the following data. **(20M)**

i) Height of each floor = 3.75 M
ii) Spacing of Columns in ck = 3.8 M
iii) Live load on roof = 1.5 KN/$m^2$
iv) Live load on each floor = 3.0 KN/$m^2$
v) Thickness of R.C. Slab = 150mm
vi) Dead weight of floor finish = 1.5 KN/$m^2$
vii) Weight of wall and beam = 10.5 KN/m

Q6. What is a Folded plate? Explain in detail the different types of folded plates. **(20M)**

Q7. Explain the following systems: **(20M)**

i) Built-active system.
ii) Vector -active System.
iii) Surface-active System.

Q8. Write short notes on any FOUR of the following: **(4x5= 20M)**

a) Differences between membrane forces and bending forces acting on a shell.
b) Different types of material in pre stressing of concrete.
c) Development of structural systems.
d) Super frame structures.
e) Space structures.
f) Difference between General truss & Virendeal truss.

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