

# SCHOOL OF PLANNING AND ARCHITECTURE, VIJAYAWADA

SEMESTER END EXAMINATIONS (SUPPLEMENTARY),  
DECEMBER-2015

## B. ARCH, III YEAR, V SEMESTER

### TS-5: THEORY OF STRUCTURES

Time – 3.00 Hours

Maximum Marks - 100

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- a) Answer any Four out of 1 to 7 questions.  
b) Question No. 8 is compulsory and out of six, four sub-questions to be answered.  
c) Scientific Calculators permitted.  
d) Steel Tables permitted.
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- Q1. a) Define Shell Structure with examples. (2x10= 20M)  
b) Write Classification of shell structures with neat sketches.
- Q2. List the various types of Structural steel sections available in the market with names and neat diagrams. (20M)
- Q3. Explain how to calculate the net effective area of Tension Members of all three cases with neat sketches. (20M)
- Q4. A Rolled Steel Joint ISMB 500 @ 569 N/m carries a uniformly distributed load over an effective span of 8m. If the beam is not restrained laterally what uniformly distributed load can the beam carry if bending and deflection conditions are not to be exceeded? Use  $f_y = 250 \text{ N/mm}^2$ . (20M)
- Q5. Design an 'I – section' purlin to support a corrugated GI sheet roof for the following data: (20M)
- |                             |                        |
|-----------------------------|------------------------|
| Spacing of truss            | = 5.0m c/c             |
| Span of truss               | = 15m                  |
| Spacing of purlins          | = 1.5m c/c             |
| Inclination of roof         | = $32^\circ$           |
| Wind load                   | = $1500 \text{ N/m}^2$ |
| Weight of galvanized sheets | = $140 \text{ N/m}^2$  |
| Yield stress $F_y$          | = $300 \text{ MPa}$    |
- P.T.O**

- Q6 a) List the different types of Footings and explain each with neat sketches. (2x10=20)  
b) List the methods of soil exploration and sample collections with neat sketches.

- Q7. The tension member of a truss consists of two angles 100 x 100 x 10 mm. If the two angles are fillet welded on either side of a gusset plate at the joint, design the joint. Axial tension in the member is 500 KN. Permissible shear stress in the weld is 110 N/mm<sup>2</sup>. Use side welds only. (20M)

- Q8. Write about any four of the following: (4x5=20M)
- (a) Types of Retaining wall failures
  - (b) Shallow foundations
  - (c) Permissible stress in steel structural design
  - (d) Importance of Gusset Plate
  - (e) Live load calculation for steel structures
  - (f) Strength of Fillet weld

