

# SCHOOL OF PLANNING AND ARCHITECTURE, VIJAYAWADA

SEMESTER END EXAMINATIONS (REGULAR) NOVEMBER - 2016

B.ARCH II YEAR III SEMESTER

## STRUCTURAL MECHANICS (10110305)

Maximum Marks – 50

Time – 2.00 Hours

a) Answer any Two questions out of I to 4 questions.

b) Question No.5 is compulsory and answer any four out of six sub-questions.

c) Scientific Calculator is allowed.

- Q1. A Masonry dam of trapezoidal section shown in figure (1) with one vertical face. Top width of the dam is 3M, bottom width of dam is 6M and height of dam is 6M. Find the position of the centroid. (15M)

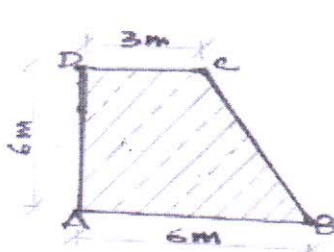


Fig.1

- Q2. A Column section Consists of two Channels ISLC 250 placed back to back. Determine the clear distance between the two channels, if the compound section has  $I_{xx} = I_{yy}$ . For each channel  $A=3,565\text{mm}^2$ ,  $I_{xx}=3,688 \times 10^4\text{mm}^4$  and  $I_{yy} = 298 \times 10^4\text{mm}^4$ . Distance of C.G from outer side of web = 27mm. (15M)

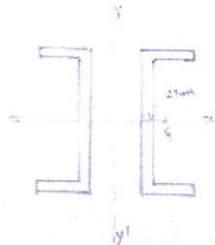


Fig.2

- Q3. Calculate SF and BM for the beam shown in figure (3). (15M)  
Also draw SFD and BMD.

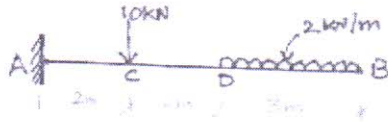


Fig.3

- Q4. A timber joist of 5m span has to carry a load of 15 KN/m over its entire span and is simply supported at its ends. Find the dimensions of the joist if the maximum permissible stress is limited to  $8\text{N/m}^2$  and the depth of the joist has to be twice the width. (15M)

- Q5. Write short notes on any FOUR of the following:

- Components of Architecture.
- Bending stress and Shearing stress.
- Draw the longitudinal section of a simply supported rectangular beam of size  $300 \times 500\text{mm}$  and span of 4M, Supported on 230mm width of wall. The beam is reinforced with 4 No's of  $16\text{mm}\phi$  bars and 2 No's of  $12\text{mm}\phi$  anchor bars. The reinforcement is provided with stirrups of  $6\text{mm}\phi$  @ 150c/c spacing.
- Calculate M.I and Radius of Gyration of rectangular section of size  $200 \times 380\text{mm}$ .
- Briefly discuss Neutral axis and Modules of Section.
- What is the maximum bending moment of a simply supported beam of span 4m carrying an UDL of 1 KN/m run over the entire span. Draw BMD.

(4x5=  
20M)