PAT-9115   Seat No. _____

B. Arch. (Sem. V) Examination

October / November - 2018

Structure - V

Time : **3** Hours]   [Total Marks : **120**

Instructions : (1) Attempt all questions.
(2) Make suitable assumptions where every necessary.
(3) Figures to the right indicate marks.
(4) IS 456, IS 2210 are permitted.

1 (a) Select the appropriate option from the below :   **10**

(1) In Conical dome Meridional & Hoop Stresses are

(a) Compressive

(b) Tensile

(c) Tensile & Compressive

(2) Cross section area of 16 mm dia.bar is

(a) 201 mm^2

(b) 150 mm^2

(c) 78 mm^2

(3) Minimum diameter of reinforcement for folded plate is

(a) 8 mm

(b) 10 mm

(c) 6 mm

(4) Compressive strength of 150 mm cube at 28 days for M20 Concrete is

(a) 20 N/mm^2

(b) 200 N/mm^2

(c) 20 Kg/mm^2

(5) Which one is correct to calculate stress in folded plate ?

(a) f = M.I/y

(b) f = M.y/I

(c) f = I.y/M

(b) State whether it is true or false   **10**

    (1) Folded plates resist the system of transverse loads by Plate action and slab action

    (2) IS 456 is code for R. C. C Design.

    (3) Curing is not necessary for R.C.C. structure

    (4) Cylindrical shell structure is economical with respect to cost of form work.

    (5) Cross section area of 10 mm dia. bar is 50 mm^2.

2   A two hinged parabolic arch is shown in figure calculate reactions Ra and Rb, Horizontal thrust-H and bending moment at point `D'.   **20**
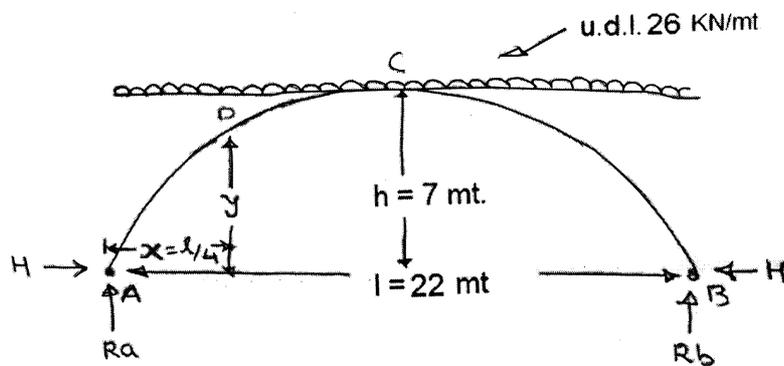
3   A spherical dome covering water tank has diameter 12.6 mt and central rise 2.5 mt. Calculate hoop stress and Meridional Thrust at base level. Drax neat sketch showing geometrical design dimensions.   **20**

Take total load(D.L.+ L.L), 4.5 KN/m^2 and thickness of dome 10 cm.

4   (a) Draw line sketches of different types of grids.   **5**

    (b) A reinforced concrete grid floor is to be designed for dead load and live load to cover a floor area of size 9.31 m X 9.31 m Dead load of concrete 2550 Kg/m^3, Floor finish 2000 Kg/m^3 and live load 400 Kg/m^2.   **35**

(i) Prepare architectural design with proportioning grid floor elements and draw neat sketches showing element dimensions.

(ii) Analyze grid floor for bending moment and stresses, draw B.M. And stresses diagrams.

(iii) Design ribs of grid floor for main bottom reinforcement steel, draw sketch showing bottom reinforcement.

5   Write brief note : (any **four**)   **20**

(1)   Surface active structures

(2)   Design loads

(3)   Shell Structures

(4)   Classification of arches

(5)   Dome Structures.

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