J-9115　　　Seat No. _____

B. Arch. (Sem. V) Examination
November – 2019
Structure - V

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

Instruction :

1. Attempt all questions.

2. Make suitable assumptions whereever necessary.

3. Figures to the right indicate full marks.

4. IS 456, IS 2210 are permitted.

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

　　1. In grid floor spacing of ribs shall be ,

　　　(a) Less than 1.5 mt. (b) More than 1.5 mt.

　　　(c) Equal to 3 mt.

　　2. Which shell structure is economical with respect to cost of form work ?

　　　(a) cylindrical shell　　(b) shell of revolution

　　　(c) shell of translation

　　3. Compressive strength of 150 mm cube at 28 days for M25 Concrete is,

　　　(a) 25 N/mm^2　　　　(b) 250 N/mm^2

　　　(c) 25 Kg^2

　　4. Minimum thickness of R.C.C. dome is,

　　　(a) 80 mm　　　　(b) 180 mm

　　　(c) 120 mm

　　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

J-9115]　　　　　　　　　　1　　　　　　　　　[Contd...

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

1. Opening in dome is not possible.

2. IS 2210 is code for design of folded plate.

3. Curing is not necessary for R.C.C. Grid floors.

4. Folded plates resist the system of transverse loads by Plate action only.

5. Cross section area of 12 mm dia. bar is 79 mm^2.

(c) Draw neat sketch showing reinforcement detailing of V-Shaped folded plate. **10**

2 Write brief note : (any three) **30**

1. Design loads for structural Design.

2. Shell structures.

3. Dome Structures.

4. Arch and Vault Structures.

3 Answer any two from below : **30**

(a) A two hinged parabolic arch is shown in figure. Calculate reactions Ra and Rb, Horizontal thrust-H and bending moment at point 'D'.
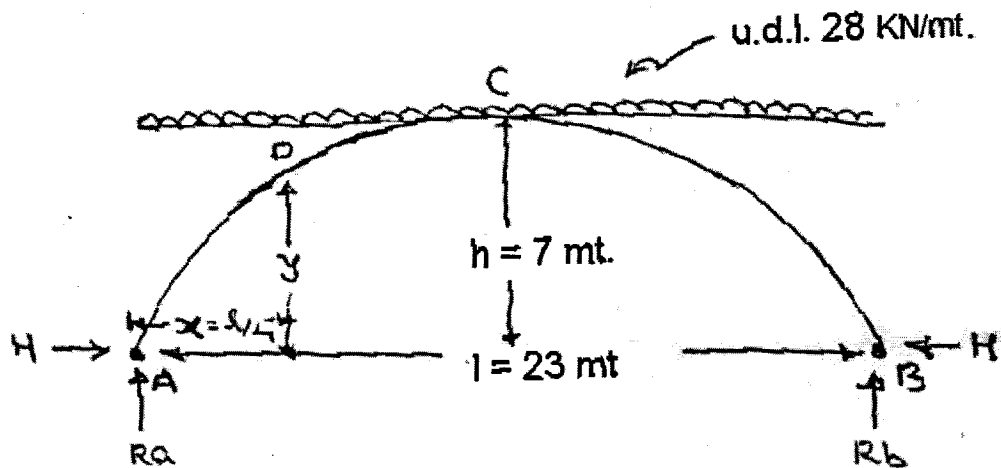
(b) A V- Shape folded plate is shown in below figure. The span of folded plate is 20 mt. and thickness of folded plate is 100 mm. Consider live load 0.6 kN/m^2 and Dead load of M-20 concrete is 25 kN/mt. Calculate Longitudinal bending stresses in plate and Draw stress diagram.
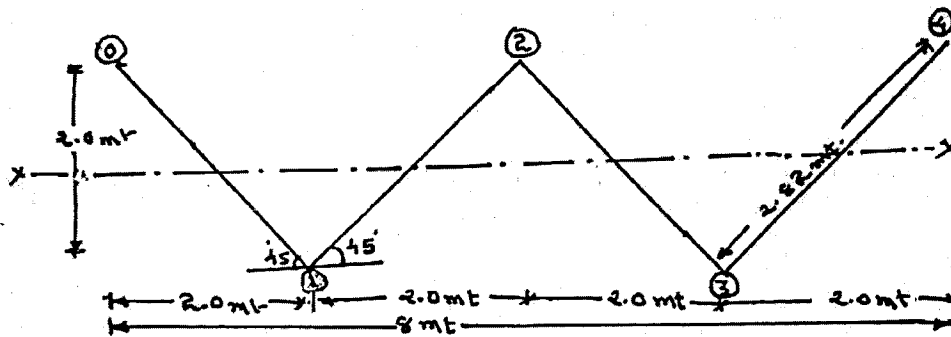
(c) A spherical dome covering water tank has diameter 12.6 mt and central rise 2.5 metre. Calculate hoop stress and Meridional Thrust at base level. Draw neat sketch showing geometrical design dimensions. Take total load (D.L.+ L.L), 4.5 kN/ m^2 and thickness of dome 10 cm.

4   (a)   Discuss with neat sketches Grid Floors :   15

(b)   A reinforced concrete grid floor is to be designed to cover a floor area of size 8.71 m × 8.71 m. out to out, wall thickness 230 mm. Prepare structural elements sizing of grid floor elements and draw neat sketches showing element dimensions in plan and cross section.   15

——————————