B. Arch. (Sem. V) Examination

November / December – 2017

Structure - V

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

SECTION - I

Instructions : (1) Do not write anything other than your seat number on question paper.

(2) Assume suitable data wherever essential and mention it clearly on answer sheet. Write appropriate units, nomenclature and draw neat sketches if necessary.

(3) Attempt any three.

1   Explain different active systems of structures. (Any three)

(A) Form Active

(B) Surface Active

(C) Vector Active

(D) Section Active

2   Enlist different types of shell structures. Also explain with sketches; Shell as surface active and form active with illustration of load carrying mechanism of the same.

3   Sketch and name different parts of an Arch and show load transfer mechanism in an arch structure. Also explain why flat arch considered as an arch even though being flat in geometry.

4   Design Supports A and B to rest simple cable as shown in the drawing as;

(a) Surface Active

(b) Vector Active
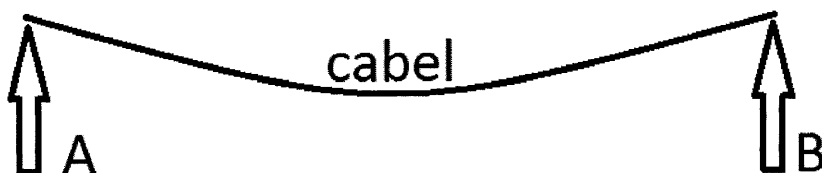
SECTION - II

Instructions : (1) Attempt all questions.

(2) Make suitable assumptions wherever necessary.

(3) Figures to the right indicates full marks.

(4) IS 456, IS 2210 are permitted.

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

(1) Minimum thickness of shell structure is

(A) 20 mm

(B) 50 mm

(C) 150 mm

(2) Compressive strength of 150 mm cube at 28 days for m-20 concrete is

(A) $2n/mm^2$

(B) $200\ n/mm^2$

(C) $20\ n/mm^2$

(3) As per IS 2210 the thickness of folded plate shall not be less than

(A) 75 mm

(B) 50 mm

(C) 150 mm

(4) In two hinged area with u.d.l. the bending moment at any point is

(A) 0

(B) wl/4

(C) $wl^2 12$

(5) Permissible stress in steel for fe415

(A) $230\ n/mm^2$

(B) $275\ n/mm^2$

(C) $190\ n/mm^2$

(6) Which shell structure is economical with respect to cost of form work ?

(A) cylindrical shell

(B) shell of revolution

(C) shells of Translation

2 State whether it is true of false : (any **five**)   10

(1) Opening in dome is possible.

(2) Human skull is an example of Naturally Occurins shell

(3) Conical dome is called shells of translation.

(4) Curing is not necessary for R.C.C. Dome structure.

(5) Folded plates resist the system of transverse loads by "Plate" and "Slab" action.

(6) Maximum diameter of bars for reinforce concrete folded plate 100 mm thick is 20 mm.

3 Write brief notes : (any **four**)

(1) Case Study of Shell by you.

(2) Funicular Shell.

(3) Pneumatic Dome.

(4) Types of folded plates.

(5) Type of Arches.

4 A V- Shape folded plate is shown in below figure. The span of folded plate is 18 mt. and thickness of folded plate is 90 mm. Consider live load 0.6 KN/m^2 and Dead load of m-20 concrete is 25. Calculate Longitudinal bending stresses in plate and Draw stress diagram.
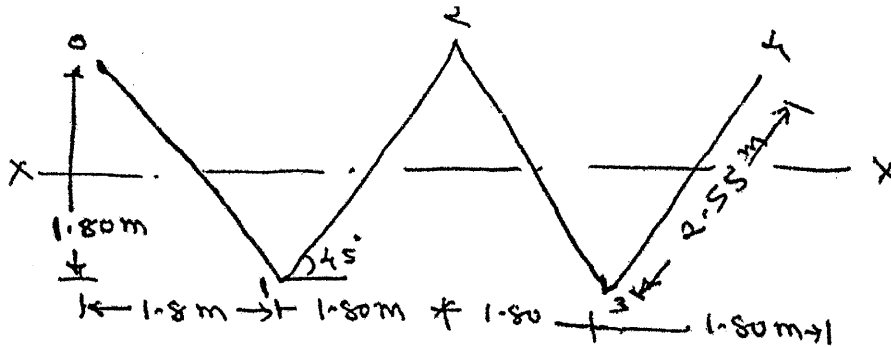
OR

4 A two hinged parabolic arch is shown in figure, calculate reaction ra and rb, Horizontal thrust-H and bending moment at point 'D'.