C

Reg. No. :

Question Paper Code: 57101

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

Seventh Semester

Civil Engineering

15UCE701 -DESIGN OF REINFORCED CONCRETE AND BRICK

MASONRY STRUCTURES

(Regulation 2015)

(IS 456:2000, IS 1905 - 1987, IS 3370 : Part-II and Part-IV are permitted)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Rankine's theory of lateral pressure was extended to other soil by _   CO1- R

   (a) Resal and Bell   (b) Mohr   (c) Terzaghi   (d) All the above

2. Dome in water tank is provided to achieve   CO2- R

   (a) Maximum strength   (b) Maximum storage

   (c) Minimum storage   (d) Minimum hoop stress

3. The decorative cap to the top of a newel post is called: CO3- R

   (a) Finials   (b) Fillet   (c) Easing   (d) Apron

4. Ina simply supported slab , alternate bars are curtailed at   CO4- R

   (a) $1/4^{th}$ of the span   (b) $1/5^{th}$ of the span   (c) $1/6^{th}$ of the span   (d)$1/7^{th}$ of the span

5. The minimum thickness of the flat slab is taken as   CO5- R

   (a)L/32 for end panels without drops   (b) L/36 for end panels without drops

   (c) L/36 for interior panels without drops   (d) All the above

PART – B (5 x 3 = 15 Marks)

6. Name the different types of retaining walls. CO1- R

7. List the factors for designing a water tank. CO2-U

8. What are the components of flat slab? CO3- R

9. State the principle of virtual work. CO4- R

10. What is meant by lateral support? CO5- R

PART – C (5 x 16= 80 Marks)

11. (a) Design a reinforced concrete cantilever type retaining wall , CO1- App (16) having a 5m full stem. The wall retains the soil with its top. The soil weighs $18000N/m^3$, and has an angle of repose 30^0. The SBC of soil is $200KN/m^2$. Use M20 grade concrete and Fe 415 Steel.

Or

(b) Design a counter fort retaining wall for the following data. CO1- App (16)
Height of the wall above the ground level = 6m
SBC of the soil = $160KN/m^2$.
Angle of friction = 33^0.
Density of the soil = $16KN/m^3$.
Spacing of the counter fort = 3m c/c
Use M20 grade concrete and Fe 415 Steel.

12. (a) Design a underground water tank of internal dimension CO2- E (16) 6mx3mx3m. The soil surrounding the tank always remains dry. The tank shall be provided with a roof slab. The soil weighs $16000 N/m^2$, having an angle of repose 30^0. Use M20 grade concrete and Fe 415 Steel.

Or

(b) A reinforced concrete dome of 6m base diameter with a rise of CO2- E (16) 1.25m is to be designed for a water tank . The uniformly distributed live load including finishes on dome may be taken as $2KN/m^2$. Adopt M20 concrete and grade one steel . Design the dome and the ring beam , permissible tensile stress in steel is $100N/mm^2$.

57101

13. (a) Design a interior panel of flat slab with drops for an office floor   CO3- U   (16)
to suit the following data.

Size of floor = 20m X 20m

Size of panel = 5m X 5m

Loading class = 4 KN/m^2

Grade of concrete = M 20

Grade of steel = Fe 415

Or

(b) Explain the step by step procedure for reinforced concrete walls.   CO3- U   (16)

14. (a) Design a rectangular slab 5mx4m in size and simply supported at   CO4- Ana   (16)
the edges to support a service live load of 4KN/m^2. Assume
coefficient of orthotrophy as 0.7 Use M20 grade concrete and Fe
415 Steel.

Or

(b) Design a reinforced circular slab for the following data .   CO4- Ana   (16)
 Diameter of the slab = 5.5m
Service load = 4KN/m^2.
Floor finish load = 1KN/m^2.
The slab is simply supported along the edge. Use M20 grade
concrete and Fe 415 Steel.

15. (a) Design a interior cross wall with axially loaded and on stiffened   CO5- E   (16)
solid wall constructed in a two storied building to carry 100mm
thick RCC slabs with 3m ceiling height. It support a 2.65 m wide
slab with live load on roof = 1.5KN/m^2. Live load on floor =
2KN/m^2, weight of 80mm thick terrace = 1.96KN/m^2, weight of
floor finish = 0.8KN/m^2.

Or

(b) Design an interior wall of two storied building load due to   CO5- E   (16)
unequal short spans of roof / floor of 4m and 3m , on either side
of the wall. The height of each storey is3m , assume the intensity
of loading as i) from roof = 6KN/m^2 and ii) from floor =
4KN/m^2.

57101

57101