PAPER ID-410528

Subject Code: KCE073

Roll No: | | | | | | | | | | | | | |

B.TECH.

(SEM VII) THEORY EXAMINATION 2021-22

ADVANCED CONCRETE DESIGN

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Q no.	Question	Marks	CO
a.	Define liquid retaining structures.	2	1
b.	What is approximate method for design of tank?	2	1
c.	Define INTZ tanks.	2	2
d.	Define top dome for overhead tanks.	2	2
e.	What is prestressing?	2	3
f.	Define degree of prestressing.	2	3
g.	What are ultimate tensile strength?	2	4
h.	Define kern distance.	2	4
i.	Define deep beams.	2	5
j.	Where Corbel are used?	2	5

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Find out the earth pressure on tank when wall with moist back fill when the tank is empty and underground.	10	1
b.	Analyze the overhead tanks for Wind forces.	10	2
c.	Write the advantages of Prestressed concrete over Reinforced concrete.	10	3
d.	In a post tensioned beam the cable is subjected to 1150 N/mm^2. If the slip at the jacking end is found to be 3.50 m . Find the percentage loss of stress due to this case if the beam is 20 m long.	10	4
e.	What situation when deep beams are used ? And write empirical expressions for lever arm (z).	10	5

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	A clarifier tank of diameter 35 m has walls 5.25 m tall above its base slab. Using M25 concrete and Fe 415 steel design the tank.	10	1
b.	Find the active earth pressure for the tank if back fill is saturated sandy soil.	10	1

4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Find the Bending moment for the base slab of tank situated above ground level.	10	2
b.	A reinforced concrete water tank is 6mx 3 m with a maximum depth of 2.5m . 150 mm x 150 mm splays are provided at the junction of walls and base slab . The tank is supported on brick masonry walls all round. Design the tank use M20 concrete and mild steel reinforcement.	10	2

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Write the basic concepts of Prestressed concrete.	10	3
b.	A rectangular concrete beam 300 mm x 500 mm with a span of 7.5m is prestressed by a straight cable carrying an effective prestressing force of 400 kN, located at an eccentricity of 50 mm . If the beam supports a live load of 2.5 kN/m, calculate the resultant stresses at the central cross – section of the beam.	10	3

6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Write the short notes on following ; (i) Loss due to shrinkage of concrete (ii)Loss due to friction for curvature effect.	10	4
b.	A pretensioned concrete beam , 150 mm wide and 300 mmm deep , is prestressed by straight wires carrying a initial force of 150 kN at an eccentricity of 50 mm. The values E_s and E_C are 210 kN/m^2 and 35 kN/m^2 respectively. Estimate the percentage loss of stress in steel due to elastic deformation of concrete if the area of steel wires is 188 mm^2.	10	4

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	A corbel attached to a 250 mm x 250 mm R.C.C. column , carries a factored load of 400 kN at a distance of 170 mm from the face of column. Design the corbel using M25 concrete.	10	5
b.	Design a deep beam 300 mm wide and 4 m deep, simply supported over a span of 6 m . The beam carries a live load of 160 kN/m at the service state and is supported on walls of 600 mm thick on each end . Use M20 concrete and Fe415 steel having permissible tensile stress of 230 N/mm^2	10	5