Register Number:……..

KUMARAGURU
college of technology
character is life

B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

CIVIL ENGINEERING

U18CEI6201: Design of Masonry and Reinforced Concrete Elements

(IS: 456-2000, SP-16, IS:1905)

COURSE OUTCOMES

CO1: Design masonry walls subjected to axial and eccentric loads
CO2: Design rectangular and flanged reinforced concrete beams under flexure.
CO3: Design reinforced concrete staircase.
CO4: Design rectangular and flanged reinforced concrete beams shear and torsion.
CO5: Design reinforced concrete short and slender columns.
CO6: Design isolated and combined footing for columns.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Define load bearing and non- load bearing walls?	CO1	[K_1]
2.	Explain effective length of masonry wall.	CO1	[K_2]
3.	Explain under reinforced and over reinforced section.	CO2	[K2]
4.	List out the advantages of reinforced cement concrete	CO2	[K_1]
5.	Draw different types of staircase.	CO3	[K_2]
6.	Explain general guidelines for design of staircase.	CO3	[K_2]
7.	Demonstrate procedure for the shear design of RC beam.	CO4	[K_2]
8.	Define short column and slender column.	CO5	[K_1]
9.	Explain transverse reinforcement in column.	CO5	[K_2]
10.	Explain causes of failure in foundation.	CO6	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Design an interior cross wall for a two storey building to carry 125 mm thick RC slab with 3m ceiling height. The wall is unstiffened and it supports 3.0 m wide slab.	8	CO1	[K4]
	b)	Compare braced & unbraced wall and list the factors to be considered for designing masonry wall.	8	CO1	[K2]
12.	a)	Calculate Moment of Resistance for the beam section of size 300mmx600mm, effective depth of 550mm over a length of 7m which carries a limit state load of 28kN/m, use M25 and Fe 500 steel.	8	CO2	[K4]
	b)	Design a rectangular beam to carry a total load of 20kN/m, over a span of 6m. Use M20 and Fe415 steel. Assume width of the beam = 250mm.	8	CO2	[K4]
13.	a)	Design a straight stair without landing for a height of 2.4m and width is 1 m. Live load =3000 N/m2,RCC Steps of rise 200 mm and tread 250 mm are used. Use M20 and Fe415 steel.	8	CO3	[K4]
	b)	Design a dog legged stair for a height of 3.0m and width is 1 m. Live load =3000 N/m^2, and finishes 500 N/m^2. RCC Steps of rise 200 mm and tread 300 mm are used. Use M25 and Fe415 steel. Width of landing =1m.	8	CO3	[K4]
14.	a)	Calculate Strength of Shear reinforcement Vus, for the given details, Beam subjected to a UDL of 30kN/m over a span of 6m. It is reinforced with 4 nos of 20mm dia in the tension zone. The size of the beam is 250 x 500mm. Effective depth =460mm. Use M20 and Fe 415 steel.	8	CO4	[K4]
	b)	Calculate maximum moment of resistance & maximum live load of a flanged section, if Bf = 900mm, Df=75mm, bw=300mm, d=350mm, D=400mm, effective span = 6.5m. It is reinforced with 5 nos of 20mm dia. Use M20 and Fe 500 steel.	8	CO4	[K4]
15.	a)	Design a circular column with helical reinforcement for a factored load of 1500 kN. Use M20 and Fe 500.	8	CO5	[K4]
	b)	Design a short column for biaxial bending with Pu=1000 kN, Mux=75 kNm, Muy=50kNm. Size=350 x 450 mm. d'=50 mm, reinforced with 8 nos of 20mm dia. Use M25 and Fe 415.	8	CO5	[K4]
16.	a)	Design a Rc footing for a masonry wall of thickness 200mm carrying a UDL of 200kN/m. The safe bearing capacity is 150kN/mm^2. Use M25 and Fe415 steel.	8	CO6	[K4]
	b)	Design RCC isolated footing for 400mmX400mm column size which carries load of 1200kN on the column, take Soil bearing capacity of soil (SBC) is 200kN/m^2. Assume M20 grade concrete and Fe 415 grade steel.	8	CO6	[K4]

****