Vivekananda College of Engineering & Technology, Puttur
[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]
Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

CRM08   Rev 1.10   ‹Civil›   ‹14/10/2020›

CONTINUOUS INTERNAL EVALUATION- 1

Dept: CV   Sem / Div: 5th   Sub: Design of RCC Structural Elements   S Code: 18CV53
Date: 20/10/2020   Time: 9:30-11:00 am   Max Marks: 50   Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.

Q N		Questions	Marks	RBT	COs
		PART A			
1	a	Define Characteristic Strength and Characteristic Load with neat sketches.	6	L2	CO1
	b	What is stress block? Derive from the fundamentals the expression for area of stress block $0.36f_{ck}bx_u$ and show that depth of centre of compressive force from the extreme fibre in compression is $0.42x_u$.	11	L2	CO1
	c	Explain principles of Limit State method of design.	8	L2	CO1
		OR			
2	a	Explain the term partial safety factor for loads and materials.	6	L2	CO1
	b	Differentiate between of balanced section, under reinforced and over reinforced sections with sketches.	11	L2	CO1
	c	Differentiate between working stress method and limit state method.	8	L2	CO1
		PART B			
3	a	Show that $Mu_{lim}=0.138f_{ck}bd^2$ for Fe415 steel.	6	L2	CO2
	b	RCC beam of section 300mm x 550mm (overall) is reinforced with 4 numbers of 16mm diameter bars with an effective cover of 50mm. The beam is simply supported for an effective span of 5m. Find the maximum load carrying capacity of beam inclusive of its self weight. Use M20 concrete and Fe415 steel.	12	L3	CO2
	c	Find the moment of resistance of a singly reinforced concrete beam of size 230mm x 450mm effective reinforced with 4 numbers of 16mm diameter bars. Use M20 concrete and Fe415 steel.	7	L3	CO2
		OR			
4	a	Find the amount of tension and compression steel required for a doubly reinforced beam 250mm x 600mm subjected to an ultimate bending moment of 310kNm. Use M20 concrete and Fe415 steel. Sketch the reinforcement details.	10	L3	CO2
	b	A T shaped cross section has an effective flange width of 1500mm, flange thickness of 100mm, web width of 300mm and an effective depth of 600mm. Determine the limiting moment of resistance of the beam for the cases of tension reinforcement of i. 5 numbers of 22mm dia bars. ii. 5 numbers of 28mm dia bars. The materials used are M20 concrete and HYSD415 steel.	15	L3	CO2