Form A: Paper –Setting Blank

Ref No. –Ex/CE/T/215/2018(S)

B.C.E. 2ND YEAR 1ST SEMESTER 2018

(1st / ~~2nd~~ Semester / ~~Repeat~~ / Supplementary / ~~Annual~~ / ~~Biannual~~)

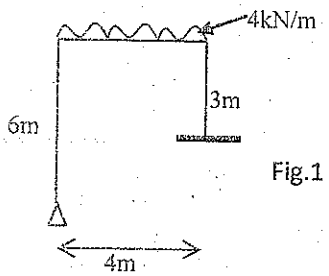
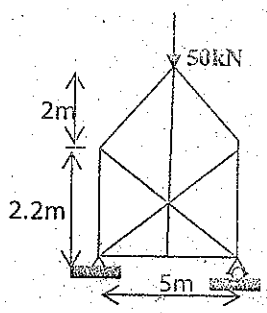
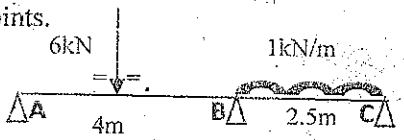
SUBJECT: *Structural Mechanics-II*

Time: ~~Two hours~~/Three hours/~~Four hours/ Six hours~~

Full Marks 100

(60 marks for part-II)

Use a separate Answer-Script for each part

No. of Q.	PART – I	
	Answer any THREE	
1.a)	State and prove Castigliano's theorem.	
b)	Find the ratio of bending and shear strain energy in the cantilever beam of 3.2m length carrying uniformly distributed load of 2.5kN/m with square c/s 300mm each side. Take Poisson's ratio as 0.15.	
c)	If the load on an axially loaded bar is trippled, by how much does the strain energy increase?	8+8+4=20
2.a)	Analyze the portal frame as shown in fig. 1 and draw bending moment diagram. Apply strain energy method.  Fig.1  Fig.2	0+10=20
b)	Find the fixed end moments and draw the SFD and BMD for a *fixed beam* subjected to uniformly distributed load for the entire length.	
3.a)	A Three Hinged Parabolic arch with span 10m, rise 2.5m is subjected to udl of 1.5KN/m for half the span at left. Find the horizontal and vertical reactions. Also find the bending moment at a distance 2.5m from left end.	8
b)	Solve the Complex truss as in Fig.2 by Henneberg's bar exchange method.	12
4.a)	Find the rotation angle θ_A at A when a simply supported beam AB of length L and constant EI is subjected to an external moment M_0 at end A. Use strain energy method.	6
b)	Solve the simple continuous beam as shown in Fig. 3. Draw SFD and BMD showing the salient points.  Fig.3	14

Form A : Paper-setting Blank

Ref. No. ...*EX/CE/T/215/2018(s)*

.....*B. E Civil Engineering 2nd Year*... EXAMINATION, *2018*
(1st / 2nd Semester / ~~Repeat~~ / Supplementary ~~/ Annual / Bi-Annual~~)

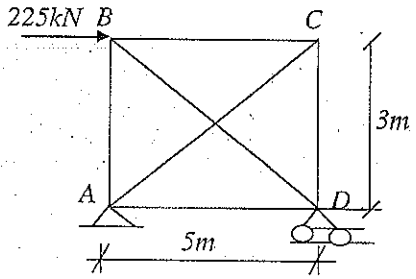
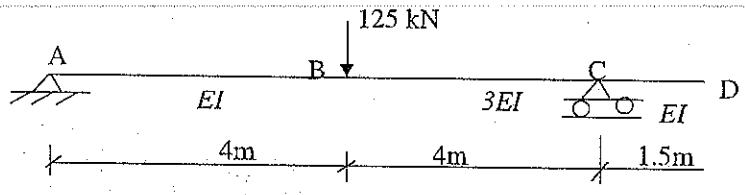
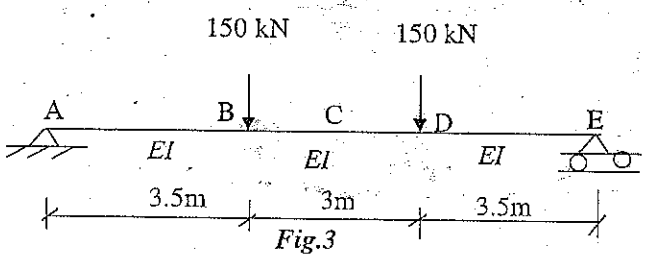
SUBJECT ...*Structural Mechanics-II*
(Name in full)

PAPER .....*XX*.....

Full Marks 100
(40 marks for part II)

Time: ~~Two hours~~/Three hours/~~Four hours/Six hours~~

Use a separate Answer-Script for each part

No. of Questions	PART II	Marks
	Answer question no. 1 and any two from the rest.	
1.	Determine the force in each member of the truss shown in Fig. 1. All members have the same cross-sectional area.	14
	 *Fig.1*	
2.	Find the slope and deflection at points *B* and *D* of given beam (Fig. 2) by **Use Moment Area Method**.	13
	 *Fig.2*	
3.	Determine the slope and deflection at point *C* of given beam (Fig. 3). **Use Double Integration Method**.	13
	 *Fig.3*	

4.	Evaluate the slope and deflection at point *B* of given beam (Fig. 4). Use conjugate beam **method.**	13

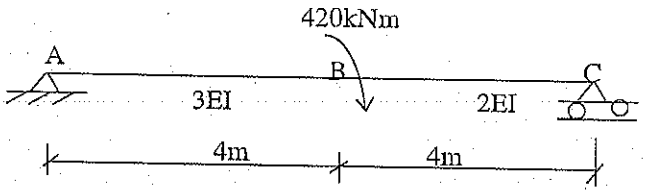


Fig.4