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10CIV13/23

First/Second Semester B.E. Degree Examination, Dec.2015/Jan.2016 Elements of Civil Engineering and Engineering Mechanics

		3 nrs.	Max. Marks: 100								
No	te: 1	1. Answer any FIVE full questions, choosing at least	st two from each part.								
	2	2. Answer all objective type questions only on OMR	sheet page 5 of the answer booklet.								
	3. Answer to objective type questions on sheets other than OMR sheet will not be valued.										
		PART – A	· A								
1	a.	Choose the correct answers for the following:	93.								
		i) A branch of civil engineering dealing with techn	nical measures to use and protect the								
		components of environment is	mear measures to use and protect the								
			Imination Production								
			Irrigation Engineering								
			Surveying								
		ii) Bypass road is constructed									
			Around the city								
		C) Over the main road D) All are true									
		iii) A bridge constructed for carrying canal water acre	oss a valley is called								
		A) Viaduct B)	Aquaduct								
		C) Super passage D)	None of these								
		iv) A dam constructed with a crest to permit overflow	v of surplus water is called								
		A) Gravity dam B)	Overflow dam								
			None of these (04 Marks)								
	b.		(05 Marks)								
	c.										
	d.		a plan.								
	С.	5 5	Suspension bridge (06 Marks)								
		(i) skew orage (ii)	Suspension orage (vo marks)								
2	a.	Choose the correct answers for the following:									
		i) The characteristics of a force are									
			Point of application and line of action								
			All of these								
		ii) The action of a force on a body is not affected									
		body is called	. by the detion of any other refer on the								
		A) Principle of transmissibility									
		B) Principle of physical independence of force									
		C) Principle of superposition of force									
		D) None of above	1								
		The translatory effect of a couple on a rigid boo									
			Negative D) None of these								
A		iv) The magnitude of the moment is when a									
		A) Maximum B) Minimum C)	Zero D) None of these								
		F 1 1 1 100	(04 Marks)								
	b.		(08 Marks)								
	C.		(04 Marks)								
	d.	. Determine the moment of 100N force shown in Fig Q	(2 (d) about A, B, C, D. (04 Marks)								
3	a.	. Choose the correct answers for the following:									

between the two forces is

B) 180°

A) 0°

When force P and Q act at a point, the maximum resultant occurs when the angle θ

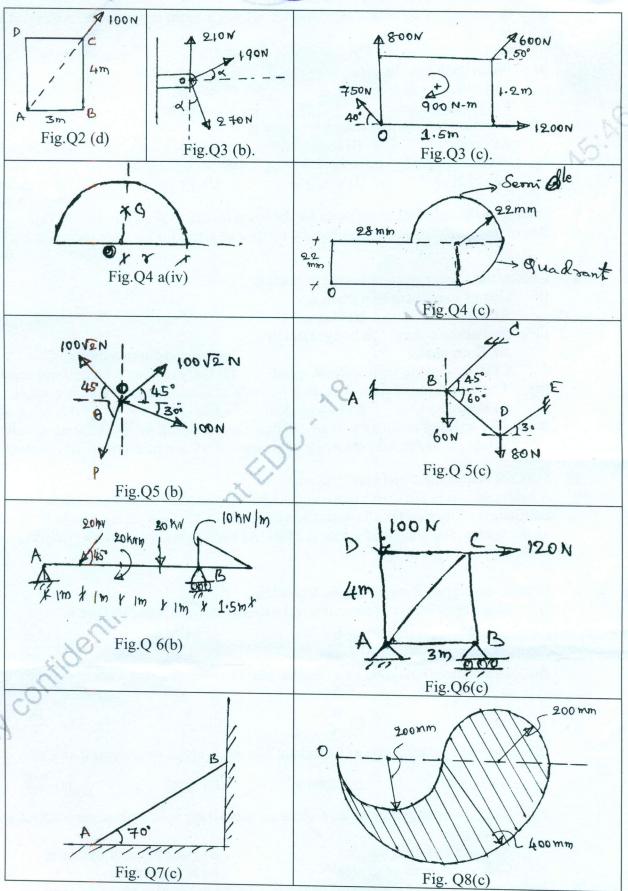
C) Both (A) and (B)

D) None of these

		11)	then their resultant is	Q(Q > P) act on the	he same straight line	but in opposite direction
			A) $P + Q$	B) PQ	C) Q-P	D) P – Q
		iii)	The position of the re	esultant force with re	espect to a point is obt	ained with the help of
			A) Low of parallelog		B) Lamis theorem	
			C) Varignon's theor		D) None of these	
		iv)	In a force system if,	Σ Fx = 0, then the re	esultant is	
			A) Horizontal	B) Vertical	C) Inclined	D) None of these (04 Marks)
	b.	A co	llar which may slide o	on a vertical rod is su	ibjected to these force	es as shown in Fig Q3(b).
		Dete	rmine (i) the value of		e resultant is horizont	al
		4 1	(ii) the magnitu			(08 Marks)
	C.				Q3 (c). Compute the r	esultant of force and its
		Y-1	intercept from point 0.			(08 Marks)
	a.	Cho	ose the correct answer	s for the following.		,0
		i)	Centroid of plane is		0/	V
			A) Weight of the bo		XV	
			B) Surface area is as		trated	
			C) Both A and B			
			D) None of the above	e	(3)	
		ii)	Centroid of a triangle	e with base b and dep	oth d is	
						D) 11 0.1
			A) $\frac{b}{3}$ and $\frac{d}{3}$	B) $\frac{1}{2}$ and $\frac{1}{2}$	C) - and - 4	D) None of these
		iii)	Centroid of a sector			
				and the second s		rSinα
			A) $\frac{4r}{3\pi}$	B) $\frac{2r \sin\alpha}{3\alpha}$	$C) = \frac{C}{C}$	D) $\frac{r \sin \alpha}{3\alpha}$
		iv)	The centroid of a ser	nicircle, shown in Fi	g Q4 a(iv) measured t	from point '0' is
			A)0, $\frac{4r}{3\pi}$	B) $r, \frac{4r}{3\pi}$	C) 0, 0	D) $\frac{4r}{3\pi}$, $\frac{4r}{3\pi}$
						(04 Marks)
	b.	Dete	rmine the centroid of	a sector of radius r b	y method of integration	on. (06 Marks)
	c.	Find	the centroid of the give	ven Fig Q4 (c) with r	respect to point 'O'.	(10 Marks)
			10			
	a.	Cho	ose the correct answer	PART –	В	
	u.	i)	If a body is in equilil		ludo that	
		1)	A) No force is actin	g on the body	iude mai	
			B) The resultant of a		he hody is zero	
		4/	C) The moment of f	forces about any poin	nt is zero	
		3	D) Both B and C	pon	11 15 2010	
1		ii)		by two forces of	equal magnitude is i	n equilibrium, the angle
1			between the two force	ces is	The second is it	in equinorium, the angle
)			A) 0°	B) 90°	C) 180°	D) 45°
		iii)	Lamis theorem is app	plicable when the thi	ree forces acting on a	body are
			A) Vertical	B) Inclined	C) Equilibrium	D) None of these
		iv)	A force or a moment	required to keep an	object in equilibrium	is called
			A) Resultant	B) Equilibrant	C) Couple	D) None of these
	1	Dat	omning the '	- 1 1' 22		(04 Morks)
	b.	in	quilibrium	and direction of forc	e P shown in Fig Q5	(b) which keep, point '0'
	•		quilibrium.	of aphla in a 111	i 1777	(08 Marks)
	c.	and	Q 5 (c) shows a system 80N. Determine the for	roes developed in 11	ium condition under t	wo vertical loads 60N
		und	80N. Determine the for			(08 Marks)
				2 o	14	

				LIBR	ART I	100	CIV13/23
6	a.	Cho	ose the correct answer	s for the following	De Galore		
		i)	In number of equations	ons available for s	solving a beam supp	ported by rollers a	t both end
		ii)	A) 1 When load acts at a A) Uniformly distrib	B) 2 particular point on outed load	B) Point load	D) 4	
		iii) iv)	C) Variable load A framed structure of A) Perfect In case of a perfect t A) n < 2j -3	B) Imperfect	C) Difficient condition is satisfied	ed	\mathcal{N}_{2}
	b. c.	Dete Dete	ermine the reactions at	supports for the b	C) $n = 2j - 3$ eam loaded as show hod of joints for the	yn in Fig.Q6 (b). e truss shown in Fig	(04 Marks) (08 Marks)
7	a.	Cho i) ii) iii) iv)	ose the correct answer Unit of coefficient o A) Newton Impending motion o A) Body at rest C) Body moving wit Limiting force of st A) Dependent The angle of inclina A) Angle of friction	f friction is B) Degree f a body refers to th uniform speed atic friction is B) Independent ation of an inclined	C) Meter B) Body about D) Body movin of area of two C) Both A ard plane at which mo	g with uniform acc surfaces in contact ad B D) None	eleration of these led
	b. c.	A lac Coef	e the law of static and dder shown in Fig Q76 fficient of friction for ladder. The weight	(c) is 5m long and all contact surface	is 0.3. A load weig	hting 1000N is mad	le to climb
8	a.	Cho i)	ose the correct answer Moment of inertia of A) $\frac{b^4}{12}$ The radius of gyratic is	f an equilateral tria B) $\frac{b^4}{36}$	angle of side b about C) $\frac{\sqrt{2}b^4}{32}$	D) $\frac{\sqrt{3}b^4}{32}$	in its pland
			A) R	B) $\frac{R}{2}$	C) $\frac{R}{4}$	D) $\frac{3R}{2}$	
		iii)	The moment of iner	4	7	2	
			A) 0.11 R ⁴	B) 0.055 R ⁴		D) $\frac{\pi R^4}{2}$	
		iv)	Moment of inertia of called A) Radius of gyratic C) Second moment of	n	B) Polar mor	ment of inertia	
	b.	Deriv	ve the equation of mor		D) None of t a triangular section	about its centroidal	
	c.	Find	principals I the moment of inerticentroid. Also find the	radius of gyration	Q8 (c) about the h a. 3 of 4	orizontal axis passi	(06 Marks) ng through 10 Marks)





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