	Reg. No.:											
	Question Paper	· Co	de:	431	04]						
В.]	E. / B.Tech. DEGREE l	EXA	MIN	ATI(ON, I	- DEC	2020	C				
	Third	Seme	ester									
	Civil E	ngine	ering	3								
	14UCE304 - MECH	ANIC	CS O	F SC	LID	S-1	[
	(Regula	tion 2	2014)								
Duration: One hour			Maximum: 30 Marks									
	PART A - (6	x 1 =	6 Ma	arks)								
	(Answer any six of th	e foll	owir	ıg qı	iesti	ons)						
Within elastic limit	in a loaded material, st	ress i	s									
(a) inversely proportional to(c) equal to strain			(b) directly proportional to strain(d) not equal to strain									
Strain energy is the												
(b) energy store (c) maximum s	ed in a body when strair train energy which can	ned uj be sto	p to to	he bain a l	reaki	ng o	f a s _l	pecir	nen			
A perfect frame sho	ould satisfy the relation_											
(a) $m = 2j + 3$	(b) $m = 3j - 4$	(c)) m=	= 2j	3		(d) i	m=3	j-2			
Moment of inertia	of a circle of diameter d	abou	it its	centi	oida	1 <i>X</i> a	xis i	s				
(a) $\pi d^4 / 64$	(b) $\pi d^4 / 50$		(c)	πr^4	/ 64		((d) π	r^4 /	35		
	_	poin	t loa	d (W	') at	free	end	of tl	ne be	am	then th	
(a) rectangle(c) right angled triangle			(b) two equal and opposite rectangle(d) two equal and opposite triangle									
The shear stess requ	uired to cause plastic de	form	ation	of s	olid	meta	l is c	allec	l			
(a) proof stress	(c)	(c) rupture stress (d) ul						ltimate stress				
	uration: One hour Within elastic limit (a) inversely pr (c) equal to stra Strain energy is the (a) energy store (b) energy store (c) maximum s (d) proof resilie A perfect frame sho (a) $m=2j+3$ Moment of inertia of (a) $\pi d^4/64$ If a cantilever bear shear force diagram (a) rectangle (c) right angled The shear stess requ	Question Paper B.E. / B.Tech. DEGREE I Third Civil E 14UCE304 - MECH (Regular uration: One hour PART A - (6: (Answer any six of the Within elastic limit in a loaded material, st (a) inversely proportional to (c) equal to strain Strain energy is the (a) energy stored in a body when strain (b) energy stored in a body when strain (c) maximum strain energy which can (d) proof resilience per unit volume of A perfect frame should satisfy the relation (a) $m=2j+3$ (b) $m=3j-4$ Moment of inertia of a circle of diameter d (a) πd^4 /64 (b) πd^4 /50 If a cantilever beam of span (L) carries a shear force diagram will be (a) rectangle (c) right angled triangle	Question Paper Coordinates B.E. / B.Tech. DEGREE EXAMOLECTION Third Seme Civil Engine 14UCE304 - MECHANIC (Regulation 2) (Regulation 2) (Regulation 2) (Regulation 2) (Regulation 3) (Regulation 3) (Regulation 3) (Regulation 3) (Regulation 4) (Regulation 2) (Regulation 3) (Regulation 3) (Regulation 4) (Regulation 4) (Regulation 5) (Regulation 6) (Regulation 6) (Regulation 6) (Regulation 7) (Reg	Question Paper Code: B.E. / B.Tech. DEGREE EXAMINAThird Semester Civil Engineering 14UCE304 - MECHANICS O (Regulation 2014) uration: One hour PART A - (6 x 1 = 6 Max) (Answer any six of the following Within elastic limit in a loaded material, stress is	Question Paper Code: 431 B.E. / B.Tech. DEGREE EXAMINATION Third Semester Civil Engineering 14UCE304 - MECHANICS OF SOME (Regulation 2014) uration: One hour PART A - (6 x 1 = 6 Marks) (Answer any six of the following question of the following ques	Question Paper Code: 43104 B.E. / B.Tech. DEGREE EXAMINATION, 1 Third Semester Civil Engineering 14UCE304 - MECHANICS OF SOLID (Regulation 2014) uration: One hour PART A - (6 x 1 = 6 Marks) (Answer any six of the following question Within elastic limit in a loaded material, stress is (a) inversely proportional to (b) directly propertion (c) equal to strain (d) not equal to strain (d) not equal to strain energy is the (a) energy stored in a body when strained within elastic lift (b) energy stored in a body when strained up to the breaking (c) maximum strain energy which can be stored in a body (d) proof resilience per unit volume of a material A perfect frame should satisfy the relation (a) $m=2j+3$ (b) $m=3j-4$ (c) $m=2j-3$ Moment of inertia of a circle of diameter d about its centroida (a) πd^4 /64 (b) πd^4 /50 (c) πr^4 /64 If a cantilever beam of span (L) carries a point load (W) at shear force diagram will be (a) rectangle (b) two equal and (c) right angled triangle (d) two equal and (d) two equal and (e) right angled triangle (d) two equal and (d) two equal and (e) right angled triangle (d) two equal and (e) rectangle (d) two equal and (e) right angled triangle (d) two equal and (e) rectangle (d) two equal and (e) right angled triangle (d) two equal and (e) rectangle (e) rectangle (d) two equal and (e) rectangle (e) rectangle (e) rectangle (f) two equal and (f) t	Question Paper Code: 43104 B.E. / B.Tech. DEGREE EXAMINATION, DEC Third Semester Civil Engineering 14UCE304 - MECHANICS OF SOLIDS - I (Regulation 2014) uration: One hour Max PART A - (6 x 1 = 6 Marks) (Answer any six of the following questions) Within elastic limit in a loaded material, stress is (a) inversely proportional to (b) directly proportion (c) equal to strain (d) not equal to strain Strain energy is the (a) energy stored in a body when strained within elastic limits (b) energy stored in a body when strained up to the breaking or (c) maximum strain energy which can be stored in a body (d) proof resilience per unit volume of a material A perfect frame should satisfy the relation (a) $m=2j+3$ (b) $m=3j-4$ (c) $m=2j-3$ Moment of inertia of a circle of diameter d about its centroidal X a (a) πd^4 /64 (b) πd^4 /50 (c) πr^4 /64 If a cantilever beam of span (L) carries a point load (W) at free shear force diagram will be (a) rectangle (b) two equal and op (c) right angled triangle (d) two equal and op The shear stess required to cause plastic deformation of solid meta	Question Paper Code: 43104 B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020 Third Semester Civil Engineering 14UCE304 - MECHANICS OF SOLIDS – I (Regulation 2014) uration: One hour Maximum PART A - (6 x 1 = 6 Marks) (Answer any six of the following questions) Within elastic limit in a loaded material, stress is (a) inversely proportional to (b) directly proportional to (c) equal to strain Strain energy is the (a) energy stored in a body when strained within elastic limits (b) energy stored in a body when strained up to the breaking of a special strain and the stored in a body (d) proof resilience per unit volume of a material A perfect frame should satisfy the relation (a) $m=2j+3$ (b) $m=3j-4$ (c) $m=2j-3$ (d) and Moment of inertia of a circle of diameter d about its centroidal X axis is (a) πd^4 /64 (b) πd^4 /50 (c) πr^4 /64 If a cantilever beam of span (L) carries a point load (W) at free end shear force diagram will be (a) rectangle (b) two equal and opposite (c) right angled triangle (d) two equal and opposite the shear stess required to cause plastic deformation of solid metal is continuous cause plastic	Question Paper Code: 43104 B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020 Third Semester Civil Engineering $14UCE304$ - MECHANICS OF SOLIDS – I (Regulation 2014) uration: One hour Maximum: 30 PART A - (6 x 1 = 6 Marks) (Answer any six of the following questions) Within elastic limit in a loaded material, stress is (a) inversely proportional to (b) directly proportional to str (c) equal to strain Strain energy is the (a) energy stored in a body when strained within elastic limits (b) energy stored in a body when strained up to the breaking of a specimic (c) maximum strain energy which can be stored in a body (d) proof resilience per unit volume of a material A perfect frame should satisfy the relation (a) $m=2j+3$ (b) $m=3j-4$ (c) $m=2j-3$ (d) $m=3j-4$ Moment of inertia of a circle of diameter d about its centroidal d axis is (a) d	Question Paper Code: 43104 B.E. / B.Tech. 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- 7. Strain energy is the
 - (a) energy stored in a body when strained within elastic limits
 - (b) energy stored in a body when strained up to the breaking of a specimen
 - (c) maximum strain energy which can be stored in a body
 - (d) proof resilience per unit volume of a material
- 8. In the torsion equation, the term J/R is called as
 - (a)shear modulus (b) section
 - (b) section modulus (c) polar modulus
- (d) none of these

- 9. In Mohr's circle of stress, the diameter represents
 - (a) maximum shear stress
- (b) deviator stress

(c) major principal stress

- (d) minor principal stress
- 10. Mohr's circle is used to determine the stresses on an oblique section of a body subjected to
 - (a) direct tensile stress in one plane accompanied by a shear stress
 - (b) direct tensile stress in two mutually perpendicular directions
 - (c) direct tensile stress in two mutually perpendicular directions accompanied by a simple shear stress
 - (d) all of the above

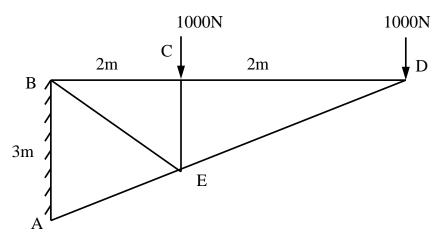
$$PART - B (3 \times 8 = 24 \text{ Marks})$$

(Answer any three of the following questions)

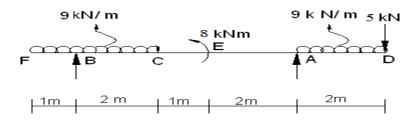
11. A steel bar is placed between two copper bars each having the same area and length as t he steel bar at $16^{\circ}C$. At this stage, they are rigidly connected together at both the ends. When temperature raised to 316 $^{\circ}C$, the length of the bar increases by 1.5 mm. Determine the final stress and strain in the bars. $E_S = 210 \ GN/m^2$, $E_C = 110 \ GN/m^2$, $\alpha_S = 0.000012 \ \text{per}^{\circ}C$, $\alpha_C = 0.0000175 \ \text{per}^{\circ}C$. (8)



12. Determine the member forces in a truss structure as shown in figure by any suitable method. (8)



13. Draw shear force and bending moment diagram for an overhanging beam shown in the figure. (8)



- 14. A solid shaft is subjected to a torque of 50 kNm. If angle of twist is 0.6° per metre length of the shaft and the shear stress is not to be allowed to exceed 85 MN/m^2 . Find suitable diameter of the shaft, Final maximum shear stress and maximum shear strain in the shaft. Modulus of rigidity of the material of the shaft is 80 GN/m^2 . (8)
- 15. A body is subjected to stresses on two mutually perpendicular planes are $30 \text{ }MN/m^2$ (tensile) and $20 \text{ }MN/m^2$ (tensile). Shear stress across this planes are $8 \text{ }MN/m^2$. Using Mohr's circle method find the magnitude and direction of the resultant stress on the plane making an angle of 35° with the plane of first stress and also find the normal and tangential stress on the plane. (8)