

USN



Internal Assessment Test II

Sub:	MECHANICS OF MATERIALS					Sub Code:	18ME32	Branch:	ME	
Date:	29/10/2020	Duration:	90 min's	Max Marks:	50	Sem / Sec:	3 rd A & B		OBE	
								MARKS	CO	RBT
1	A solid shaft rotating at 1000 rpm transmits 50 kw. Maximum torque is 20% more than the mean torque. Material of the shaft has the allowable shear stress of 50 MPa and modulus of rigidity 80 GPa. Angle of twist in the shaft should not exceed 1° in one metre length. The diameter of shaft according to strength criteria and rigidity criteria are _____ & _____ respectively.					10		CO4	L3	
2	A shaft is required to transmit 60 kw at 150 rpm. The maximum torque is 25% greater than the mean torque for a max permissible shear stress of 60 MN/m ² . Take G = 80 GPa. The diameter of shaft and angle of twist for a length of 4 m is _____mm and _____ degrees respectively.					10		CO4	L3	
3	A hollow shaft transmits 200 kw of power at 150 rpm. The total angle of twist in a length of 5m of shaft is 3°. The inner and outer diameters of the shaft are _____mm and _____ mm respectively. [Permissible shear stress is 60 MPa and modulus of rigidity is 80 GPa]					10		CO4	L3	
4	A hollow shaft of diameter ratio 3/8 is to transmit 375 kW at 100 rpm. The maximum torque being 20 % greater than the mean; the shear stress is not to exceed 60 MPa and the twist in a length of 4 metre is not to exceed 2 degrees. The external and internal diameters are _____ mm & _____ mm respectively. Take G = 80 GPa.					10		CO4	L3	
5	Proof resilience per material is known as					2		CO4	L2	
6	The capacity of a strained body for doing work on the removal of the straining force, is called					2		CO4	L2	
7	The total strain energy stored in a body is termed as					2		CO4	L2	
8	The ratio of effective length of column to least radius of gyration is called -----					2		CO4	L2	
9	A long vertical member, subjected to an axial compressive load, is called....					2		CO4	L2	

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ANSWER KEY

Q. No.	Answer
1	38.8 mm & 45.2 mm
2	74 mm & 4.646 deg
3	143.24 mm & 127.73 mm
4	154.96 mm & 58.11 mm
5	Modulus of resilience
6	Resilience
7	Resilience
8	Slenderness ratio
9	a column