GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC-SEMESTER I- • EXAMINATION -WINTER- 2016

Subject Code: X11102 Date:09/01/2017

Subject Name: Elements of Mechanical and Structural

Time: 10:30 AM to 1:00 PM Total Marks: 70

Instructions:

- 1. Attempt any five questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

Q.1	(a)	Explain with neat sketch the construction details and working of centrifugal pump.	07
	(b)	Differentiate between governor and flywheel. Describe any one type of governor.	07
Q.2	(a)	With neat sketch explain working of four stroke petrol engine.	07
	(b)	Give detailed classification of an I. C. Engines with suitable examples.	07
Q.3	(a)	Discuss in details: Types of prime movers and sources of energy.	07
	(b)	Write the statements of Zeroth, First and Second law of thermodynamics.	07
Q.4	(a)	With usual notations derive the air standard efficiency equation of Diesel cycle.	07
	(b)	With neat diagrams describe multi stage reciprocating compressors.	07
Q.5	(a)	Draw Shear force and bending moment diagram for a beam shown in fig. 1	07
	(b)	Describe with diagrams: Types of loads, Types of supports, Types of beams.	07
Q.6	(a)	Derive the relationship between Modulus of elasticity and Bulk modulus.	07
	(b)	Explain the terms: (i) Hardness (ii) Toughness (iii) Factor of Safety (iv) Resilience.	07
Q.7	(a)	Find the elongation of a steel bar of cross sectional area 200 mm ² and length of	07
		150 m, hangs vertically and Weight of 20 kN is acting at its free end. Take $E = 210$	
		GPa. and unit mass of steel is 7800 kg/m ³	
	(b)	Derive the relation for power transmitted by solid circular shaft.	07

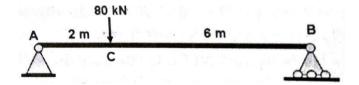


Fig.1 (Q: 5a)
