



I B. Tech II Semester Supplementary Examinations, Nov/Dec - 2017 ELEMENTS OF MECHANICAL ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (Part-A and Part-B)

2. Answering the question in **Part-A** is Compulsory

3. Answer any **FOUR** Questions from **Part-B**

PART -A

1.	a)	What is the function of (i) steam trap and (ii) steam separator?	(2M)
	b)	What is the need of a riser in casting?	(2M)
	c)	Classify the various types of air compressors.	(2M)
	d)	Explain the significance of (i) specific fuel consumption; (ii) mean effective	(2M)
		pressure in Internal combustion engines.	
	e)	What do you understand by Initial Tension in a belt?	(2M)
	f)	What do you mean by 'interference' as applied to gears?	(2M)
	g)	What is the working principle of Extrusion process?	(2M)
PART -B			
2.	a)	What are the considerations which would guide you in selecting the type of boiler to be adopted for a specific purpose?	(7M)
	b)	Explain why the blow off cock is operated periodically when the boiler is working. Where is it located? Explain its working with a neat sketch.	(7M)
3.	a)	Briefly explain the steps involved in making a casting.	(7M)
	b)	Explain the working principle involved in resistance welding. Discuss the different types of resistance welding processes.	(7M)
4.	a)	What is a reciprocating compressor? Explain the working principle. Discuss the classification of Reciprocating compressors.	(7M)
	b)	Explain any two types of Refrigeration systems.	(7M)
5.	a)	Classify Internal combustion engines with respect to (i) cycle of operation; (ii) cylinder arrangements (iii) type of ignition; (iv) types of fuel used; (v) method of charging the cylinder; (vi) type of cooling.	(6M)
	b)	An engine used for pumping water develops a brake power of 3.68 kW. Its indicated thermal efficiency is 30%, mechanical efficiency is 80%, calorific value of the fuel is 42000 kJ/kg and its specific gravity is 0.875. Calculate (i) fuel consumption of the engine in kg/h and litres/h; (ii) indicated specific fuel	(8M)

consumption of the engine in kg/n and intes/n; (ii) indicated specific for consumption. CO. IN

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- 6. a) Discuss the relative merits and demerits of belt, rope and chain drives for the (6M) transmission of the power.
 - b) Two parallel shafts 6 m apart are provided with 300 mm and 400 mm diameter (8M) pulleys and are connected by means of a cross belt. The direction of rotation of the follower pulley is to be reversed by changing over to an open belt drive. How much length of the belt has to be reduced?
- 7. a) What do you understand by a Gear Train? Discuss the various types of Gear (6M) Trains.
 - b) The number of teeth on each of the two equal spur gears in mesh are 40. The teeth (8M) have 20^0 involute profile and the module is 6 mm. If the arc of contact is 1.75 times the circular pitch, find the addendum.

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