Question Paper

Exam Date & Time: 10-Jun-2019 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
II SEMESTER B.Sc. (Applied Sciences) IN ENGINEERING END SEMESTER EXAMINATION APRIL/MAY 2019

Basic Mechanical Engg. [IME 122 - S2]

Marks: 100 **Duration: 180 mins.**

Answer 5 out of 8 questions.

1) A) Define Amount of superheat and enthalpy of superheat. List all the Advantages and disadvantages of Superheated Steam. (10)

B) A dry saturated steam at a pressure of 1 MPa is generated in a boiler. Dry saturated steam leaves the boiler to enter a super heater, where it looses heat equal to 400 kJ/kg. And in the super heater, steam is super-heated to temperature of 300^{o}C. If temperature of feed water is 28^{o}C, determine:
Total heat supplied to feed water in the boiler.
Dryness fraction of steam at the entry of super heater.
Total heat supplied in the super heater. (10)

2) A) Define i. Enthalpy of water ii. Dryness fraction iii. Enthalpy of dry saturated steam. (10)

B) With a neat labeled sketch explain the working of Babcock & Wilcox Boiler. (10)

3) A) Describe with relevant sketches any five operations that can be performed on lathe. (10)

B) With a neat schematic diagram explain the working principle of nuclear power plant. (10)

4) A) With suitable sketches explain Pressure Velocity compounding in an impulse Turbine. (10)

B) Describe the working of Vapour Compression Refrigeration System. (10)

5) Discuss the working principle of Two Stroke Diesel Engine with (10)

	A)	suitable sketches.	
	B)	A four stroke diesel engine has a bore of 100 mm, stroke of 120 mm and piston speed of 10 m/s. The engine develops 20 kW power per liter of cylinder stroke volume. Brake thermal efficiency of the engine is 30 % with a fuel having calorific value of 40 MJ/kg and specific gravity of 0.90. Determine (i) rpm, (ii) BP, and (iii) engine fuel requirements in liters/h.	(10)
6)		List out any 10 comparisons between petrol and diesel engines.	(10)
	A)		
	B)	Describe the desirable properties of moulding sand.	(10)
7)		Design a set of stepped cone pulleys for driving a machine by a belt drive from a counter shaft running at 850 rpm. The machine is to run at 350, 450 and 550 rpm and the smallest step on the countershaft is 300 mm in diameter. The distance between the centers of the two shafts is 3 meters. Sketch the arrangement.	(10)
	A)		
	B)	Describe with a sketch the working of radial drilling machine.	(10)
8)		Describe with sketch the Two Box Moulding Procedure.	(10)
	A)		
	B)	Describe all three Types of Gas Welding Flames.	(10)

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