Question Paper

Exam Date & Time: 27-Apr-2018 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES END SEMESTER THEORY EXAMINATION - APRIL 2018 II SEMESTER B. Sc. (Applied Sciences) Date: 27.04.2018 Time: 9.30 A. M. TO 12.30 P.M. **Basic Mechanical Engineering [ME 123]**

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions.

Draw neat and proportionate sketches wherever necessary. Missing data , if any, may be suitably assumed. Use of steam tables is permitted.

2)	A)	With the help of Temperature Enthalpy Diagram, explain the following	(10)
		i) Sensible heat of water	
		ii) Latent heat	
		iii) Degree of superheat	
		iv) dryness fraction.	
	B) A) B)	1000 Kg of steam at a pressure of 16 bar and 0.9 dry is generated by a boiler per hour. Steam passes through a superheater where its temperature is raised such that the	(10)
		degree of superheat is 180°C. If the temperature of feed	
		water is 30 ^o C, determine	
		a) Total heat added to feed water per hour to produce wet steam in the boiler.	
		b) Total heat absorbed per hour in the superheater.	
		Explain with the help of block diagrams the working of nuclear power plant.	(10)
		The following observations were obtained during a trial on a two stroke diesel engine. Cylinder diameter $D=25$ cm Radius of crank r= 20 cm Crankshaft speed $N=250$ rpm Net load on the brake drum (W-S)= 1400 N	(10)

		Brake drum diameter $2xR_d = 2m$	
		Mean effective pressure $P_m = 6$ bar	
		Diesel oil consumption $m_f = 0.0026 \text{ Kg/sec}$	
		Specific gravity of diesel $\rho = 0.78$	
		Calorific Value of diesel $C_{v} = 43900 \text{ kl/kg}$	
		Find: Brake Power (BP) Indicated Power (IP) Frictional	
		Power (FP). Mechanical Efficiency and Brake Thermal	
		Efficiency	
3)	۵۱	Explain with neat sketch working of a two stroke petrol engine	(14)
	B)	List any three differences between fire tube boiler and water tube boiler	(6)
4)		Explain with neat sketch, the working of Pelton Wheel	(10)
		Explain with heat sketch, the working of reiton wheel.	. ,
	A) B)	Explain with skotch splach lubrication system	(6)
	C)	List any four thormodynamic properties of ideal refrigerant	(0)
E)	0)	List any four thermodynamic properties of ideal refrigerant	(10)
5)		An engine is driving a machine by means of an open beit	(10)
	A)	and that on the driven shaft is 30 cm. The centre distance is 3m.The coefficient of friction of the material of the belt is	
		tension in the belt is 2000 N, Calculate the following. i) Linear velocity of the belt.	
		II) Length of the belt.	
	B)	list the advantages and limitations of goar drive	(10)
6)	5)	List the advantages and inflications of gear drive	(10)
0)	A)	pulley	(10)
	В)	Two parallel shafts are to be connected by a gear drive. They are very nearly 1m apart and their velocity ratio is to be exactly 9:2. If the circular pitch of the gears is 57mm, find the number of teeth in each of the two wheels and distance between the shafts.	(10)
7)		With neat sketch, explain the method of taper turning	(10)
	A)	operation in Lathe by swiveling the compound rest.	
	B)	Write note on welding defects	(10)
8)		Write note on pattern allowances	(10)
	A)		
	B)	List the differences between annealing and normalising	(10)

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