## **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 Engg. [IME 122]

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.

1)	A)	Draw the schematic diagram of Locomotive Boiler and lable the parts	(10)
	В)	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 degree of superheat is 180°C. If the temperature of feed water is 30 °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.	(10)
2)	A)	With the help of block diagrams explain the working principle of coal based power plant	(10)
	B)	List the differences between petrol and diesel Engines	(10)

3)

A)

(10)

The following observations were obtained during a trial on a two stroke diesel enaine. 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 Brake drum diameter  $2xR_{d} = 2 m$ Mean effective pressure P = 6 bar Diesel oil consumption m = 0.0026 Kg/secB) (10)What is meant by compounding of turbines? Explain pressure Specific gravity of diesel  $\rho = 0.78$ Velocity compounding of impulse steam turbine. Indicate the Calovififiateline of pressure and blades. Find: Brake Power (BP), Indicated Power (IP), Frictional Power (FP), Mechanical Listernyeten, deakable properties not a galacted friger and Efficiency (10) 4) A) (10)B) With neat sketch explain the working of fast and loose pulley 5) A shaft is to be driven at 480 rpm, from a driving shaft that rotates <sup>(10)</sup> at 200 rpm, through an open flat belt drive. The center distance of A) the drive is 1000 mm and the diameter of the driving pulley is 240 mm. The coefficient of friction between the belt and the pulleys is  $\mu = 0.3$ . If the drive can transmit a maximum power of 3 kW without slipping of the belt relative to the pulleys, determine the necessary belt width if the safe permissible belt tension is 15 N per mm of belt width. Neglect any centrifugal effects. B) Explain with neat sketch, thread cutting operation performed on (10)lathe 6) Write note on any 5 defects in cast parts (10)A) (10) B) Explain with neat sketch the working of a two stroke diesel engine (10)7) 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. A) If the circular pitch of the gears is 57 mm, find the number of teeth in each of the two wheels and distance between the shafts. B) (10)With neat sketch explain the principle of drop forging operation 8) With neat sketch, explain the process of resistance spot welding (10)A) B) (10)List the differences between annealing and normalising

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