

REVISED KEY

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INSPECTOR OF BOILERS IN A.P BOILERS SERVICE- PAPER-II

008. A piston-cylinder arrangement contains a gas. The gas is allowed to expand from 0.04 m³ to 0.08 m³ at a constant pressure of 2 MPa and it receives 100 kJ of heat during the expansion process. What is the change in internal energy of the gas?

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010. Related with combustion of fuels, what is the meaning of equivalence ratio?

Equivalence ratio is the ratio between the stoichiometric air - fuel ratio and actual air - fuel ratio.

021. In a counter flow heat exchanger, the hot fluid enters at 85° C and leaves At 50°C and the corresponding temperatures of the cold fluid are 28 ° C and 68°C. Assuming the heat capacity rate of hot fluid as 1.2 times of that Of cold fluid, calculate the effectiveness of the heat exchanger.

0.70 and 0.73 (Both answers are correct)

037. What is the technical definition for the relative humidity?

Relative humidity is the ratio of the actual mass of water vapour in a given volume moist air to the mass of water vapour in the volume of saturated air at the same temperature and pressure.

045. Centrifugal compressors are normally employed in refrigerant cycle that require Large refrigerant flow rate and high condensing pressure.

Large refrigerant flow rate and low condensing pressure.

048 In case of sensible cooling of air, the bypass factor is given by (where td_1 = Dry bulb temperature of air entering the cooling coil, td_2 = Dry bulb temperature of air leaving the cooling coil, and td_3 = Dry bulb temperature of the cooling coil)

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053. The steam expansion in a reaction turbine is represented in Mollier diagram

As:

Vertical straight line from top to bottom

080. A mass of 1 kg is fixed at the middle of a spring of stiffness of 10 N/mm as shown in the figure (fig. 1). What is the natural frequency (in Hz) of the system?

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096. In a simple quick return mechanism shown in the figure (fig. 2), AC = 100 mm, AB = 200 mm. What is the ratio of time for forward motion to that for return motion?

2.0

107. What is main purpose of adding tungsten in high speed steel?

To improve wear resistance of the material

126. What is the interplanar spacing between the (1,1,0) planes of a cubic lattice of length 160 μm ?

113 μm

131. Porosity of welded joint is due to

High Welding Speed

139. AOQL stands for

Average out going quality level.

142. Refer the following data that is related to a product supply unit, what is the number of annual orders per year? Number of units on demand per year = 5000 Cost to make one order = Rs. 100/- Holding cost per unit per year = Rs. 50/-

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145. Which of the following wage incentive plan guarantees minimum wage to a worker and bonus is paid for the fixed percentage of time saved?

Hasley Plan

148. The following data refer to a factory that has several machines and wants to install its own service facility for repairing the machines (the repair time has exponential distribution).

The average number of breakdown per day = 3

Loss incurred due to inoperative machine = Rs. 40 per day

Service facility, X

Cost of installation of facility = Rs. 20,000/-

Labour cost to operate the facility = Rs. 5000/- per year

Number of repair can perform per day = 4

Life span of the service facility = 4 years Service facility, Y

Cost of installation of facility = Rs. 40,000/-

Labour cost to operate the facility = Rs. 8000/- per year

Number of repair can perform per day = 4

Life span of the service facility = 4 years

Considering the annual cost, which of the service facility is better?

Facility X is better than facility Y