

## V-1831

### B. E. (Eighth Semester) Examination, 2020

(For ATKT Students)

(Mechanical Engg. Branch)

(801-A)

#### ENERGY MANAGEMENT and AUDIT

*Maximum Marks : 70*

*Note : Attempt all parts. Each part carries equal marks.*

1. (a) Discuss energy conservation tips in Transport and Household sector.  
(b) Discuss the concept of energy management. Discuss various tools used for it.
2. (a) Write short note on matching energy use to requirement.  
(b) State importance of energy audit. Discuss types of energy audit.
3. (a) Describe in detail the method of preparing process flow chart used in material energy balance.  
(b) Define energy planning and energy policy.
4. (a) Explain the important characteristics of energy efficient motor.  
(b) Explain energy conservation technique in electrical motors.
5. (a) Explain waste heat technique and building energy management.  
(b) What is co-generation? What are its benefits? Discuss in short various co-generation techniques.

**V-1832****B. E. (Eighth Semester) Examination, 2020****(For ATKT Students)****(Mechanical Engg. Branch)****(ME-802)****MACHINE DESIGN*****Paper : Second******Maximum Marks : 70******Note:*** Attempt all questions. All questions carry equal marks.

1. A electric motor running at 1150 rpm is to drive a compressor pulley which runs at 400 rpm. Select the size and number of V-belts required to transmit 14.7 kW power. 14
2. (a) Write short note on selection of material for gears. 7  
 (b) Explain why bevel factor is introduced in the lewis equation for bevel gear. 7
3. A four-stroke diesel engine has the following spec-fications  
 Brake Power = 5 kW  
 Speed = 1200 r.p.m.  
 Indicated mean effective pressure = 0.35 N/mm<sup>2</sup>  
 Mechanical efficiency = 80%  
 Determine :  
 (i) Bore and length of cylinder  
 (ii) Thickness of the cylinder head  
 (iii) Size of studs for the cylinder head 14
4. (a) Differentiate between a coupling and a clutch. What are the requirements of a good coupling? 7  
 (b) Define pressure vessel. Differentiate between a thin and thick pressure vassel. 7
5. (a) What is optimization? Discuss various optimization methods in brief. 7  
 (b) Explain the following term : 7  
 (i) Design vector  
 (ii) Objective function

**V-1833****B. E. (Eighth Semester) Examination, 2020****(For ATKT Students)****(Mechanical Engineering Branch)****REFRIGERATION and AIR-CONDITIONING***Paper : (ME-803)**Maximum Marks : 70**Note: Attempt all questions. All questions carry equal marks.*

1. (a) Write short note on :
  - (i) Heat Engine
  - (ii) Refrigerator
  - (iii) Heat pump
- (b) The capacity of a refrigerator is 220 TR when working between  $-6^{\circ}\text{C}$  and  $25^{\circ}\text{C}$ . Determine the mass of ice produced per day from water at  $30^{\circ}\text{C}$ . Also find the power required to drive the unit assume that the cycle operates on reversed Carnot cycle and latent heat of ice is  $335\text{ kJ/kg}$ .
2. (a) State the advantages of vapour compress refrigeration system over air refrigerator.
- (b) A simple vapour compression has with piston displacement of  $3\text{ m}^3/\text{min}$ , a condenser pressure of 14 bar and evaporator pressure of 3.5 bar. The liquid is sub cooled to  $20^{\circ}\text{C}$  by soldering the liquid line to suction line. The temperature of vapour leaving the compressor is  $100^{\circ}\text{C}$ , heat rejected to compressor cooling water is  $5500\text{ kJ/hour}$ , and volumetric efficiency of compressor is 0.8 find out :
  - (i) Capacity
  - (ii) Indicated power
  - (iii) COP of the system
3. (a) What is the basic function of compressor in vapour compression refrigerating system? How this function is achieved in vapour absorption refrigerating system?
- (b) Explain the working of steam jet refrigerating system.
4. (a) Define and explain the dry bulb, wet bulb and dew point temperature.
- (b) The humidity ratio of atmospheric air at  $30^{\circ}\text{C}$  dry bulb temperature and 770 mm of mercury is  $0.016\text{ kg/kg}$  of dry air. Determine :
  - (i) Partial pressure of water vapour
  - (ii) Relative humidity
  - (iii) Dew point temperature
  - (iv) Specific enthalpy and vapour density
5. (a) Describe the bypass factor for cooling coils.
- (b) Explain the procedure of drawing GSHF line on a psychrometric chart.

## V-1834

### B. E. (Eighth Semester) Examination, 2020

(For ATKT Students)

(Mechanical Engg. Branch)

*Paper : ME-804*

**CAD/CAM/CIM**

*Maximum Marks : 70*

*Note : Attempt all parts. Each part carries equal marks.*

1. (a) Explain the concept of Design for manufacturing. Discuss the CIM wheel and its components.  
(b) What are the difficulties in traditional process planning? Explain Generative and Variant type CAPP systems with examples.
2. (a) What is the need of concatenation of transformation? Explain the care to be taken in such cases.  
(b) Explain different CAD standards. How IGES is different from GKS.
3. (a) Differentiate between Constructive Solid Geometry (CSG) and Boundary representation.  
(b) Compare 2D and 3D wireframe modeling with respect to their utility for an engineering industry.
4. (a) State the principle of Numerical Control. Explain the functions that are expected to be served by numerical control in machine tools.  
(b) Explain the concept of floating datum and set point with reference to CNC part programming. Explain their relationship.
5. (a) Write down the benefits of Group Technology. Explain OPTIZ and MICLASS codes used in Group Technology.  
(b) On what basis Parts Classification & Coding is performed. Briefly explain the Chain & Hierarchical coding approaches with examples.