Roll No. | | | | | | | | ✓ |

**B.E (Full Time) End Semester DEGREE EXAMINATION, APRIL / MAY 2011**

Sixth semester

Mechanical Engineering

**ME 385 – COMPUTER INTEGRATED MANUFACTURING**

(Regulation 2004)

Time : 3 Hours | Answer ALL Questions | Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. List the benefits of CAD?
2. A production machine is operated 45 hr/week. Production rate is 15 units/hr. During certain week, the machine produced 600 good parts and idle the remaining time.

   Find i) Production capacity ii) Utilization of the machine.
3. What is meant by concurrent engineering?
4. List the benefits of CAPP?
5. List any four major benefits of a well designed classification and coding system.
6. What is meant by Lean manufacturing?
7. What are the common Data files required for a FMS?
8. List any four practical applications of FMS.
9. What are the basic elements in Robotic system?
10. How do you specify a Robot?

**Part – B ( 5 x 16 = 80 marks)**

11. a) i) What are the common FMS layout configurations? Discuss the merits and demerits. (8)

    ii) Describe the types of materials handling devices used in a FMS. (8)

12. a) What are the various functions in manufacturing? Explain in detail. (16)

    **OR**

    b) What are the common strategies employed in Automation? Discuss any six in detail. (16)

13. a) How the MRP II differ from MRP? Explain with suitable examples. (16)

    **OR**

    b) Distinguish between Retrieval and Generative types of Computer Aided Process Planning. (16)

13. (a) (i) Why indirect Method is preferred for computing boiler efficiency (4)

(ii) During the test of an oil fired water tube boiler, the following observations were noted : (12)

Steam Pressure = 16 bar (abs); water evaporated per minute = 282.85 kg; feed water temperature = $76^0$C; steam quality = 99% dry; fuel oil consumption rate = 22.45 kg per minute; heating value of fuel oil = 44,966 kJ/kg.

Calculate : Actual evaporation per kg of fuel oil, Factor of evaporation and Boiler Efficiency

***(or)***

(b) (i) In a brewery chilling system, ethylene glycol is used a secondary refrigerant. The designed capacity is 40 TR. The observations made on the performance study is presented below (12)

Temperature of ethylene glycol entering evaporator = (-) $1^0$C

Temperature of ethylene glycol leaving evaporator = (-) $4^0$C

Flow rate of ethylene glycol = 13200 lph

Power input to compressor = 39.5 kW

Specific heat capacity of ethylene glycol = 9.8 kJ/kg$^0$C

Determine (i) Actual refrigeration effect (ii) COP (iii) EER

(ii) What is static, dynamic & total pressure and how these are used for performance evaluation of fans & blowers (4)

---

14. (a) (i) With a neat sketch compare the working principle, advantages and drawbacks of Float coupled thermostatic and Thermodynamic steam traps (8)

(ii) List atleast 8 guidelines for proper drainage and layout of steam supply network (8)

***(or)***

(b) (i) Following were the observations during compressor trial in a textile plant: (12)

Receiver capacity : 10 m$^3$

Initial pressure : 0.2 bar and Final pressure : 6.0 bar

Additional hold-up volume : 1.2 m$^3$

Compressor pump-up time : 4.26 minutes

Motor power consumption (avg.) : 98.6 kW

Calculate the operational capacity of compressor & specific power consumption (neglect temperature correction)

(ii) Explain how the efficacy of Intercooler affect the power consumption in a reciprocating air compressor (4)

---

15. (a) Three mutually exclusive projects A,B and C have been proposed. Each projects require investment worth Rs. 2,00,000 and have an estimated life of 5 years, 4 years & 3 years respectively. After its life cycle, the salvage value of the projects is observed to be zilch. The company's required rate of return is 10 %. The anticipated cash flows after taxes ( CFAT ) for the three projects are as follows

| Year | CFAT for Projects (Rs.) | | |
|---|---|---|---|
| | A | B | C |
| 1 | 50,000 | 80,000 | 1,00,000 |
| 2 | 50,000 | 80,000 | 1,00,000 |
| 3 | 50,000 | 80,000 | 10,000 |
| 4 | 50,000 | 30,000 | - |
| 5 | 1,90,000 | - | - |

Rank each project applying the methods of SPB, ARR, NPV & IRR

***(or)***

(b) Compare the project acceptance criteria, merits and demerits of the following financial appraisal techniques:

Simple payback period, Net Present Value,

Average Rate of Return & Internal Rate of Return