

8E8071	Roll No. _____	[Total No. of Pages : 3]
	<b>8E8071</b>	
	<b>B.Tech. VIII Semester (Main/Back) Examination, April/May - 2017</b>	
	<b>Mechanical Engg.</b>	
<b>8ME1A Computer Integrated Manufacturing Systems</b>		

**Time : 3 Hours**

**Maximum Marks : 80**  
**Min. Passing Marks : 26**

**Instructions to Candidates:**

*Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit-I**

1. a) Explain various types of manufacturing systems. (6)
- b) Explain Product cycle. Briefly outline various achievements in CAD/CAM. (4+6)

**OR**

1. a) Briefly explain various basic components of NC system. Explain the NC procedure for milling a part. (5+5)
- b) Briefly explain economics of NC manufacturing over conventional manufacturing. (6)

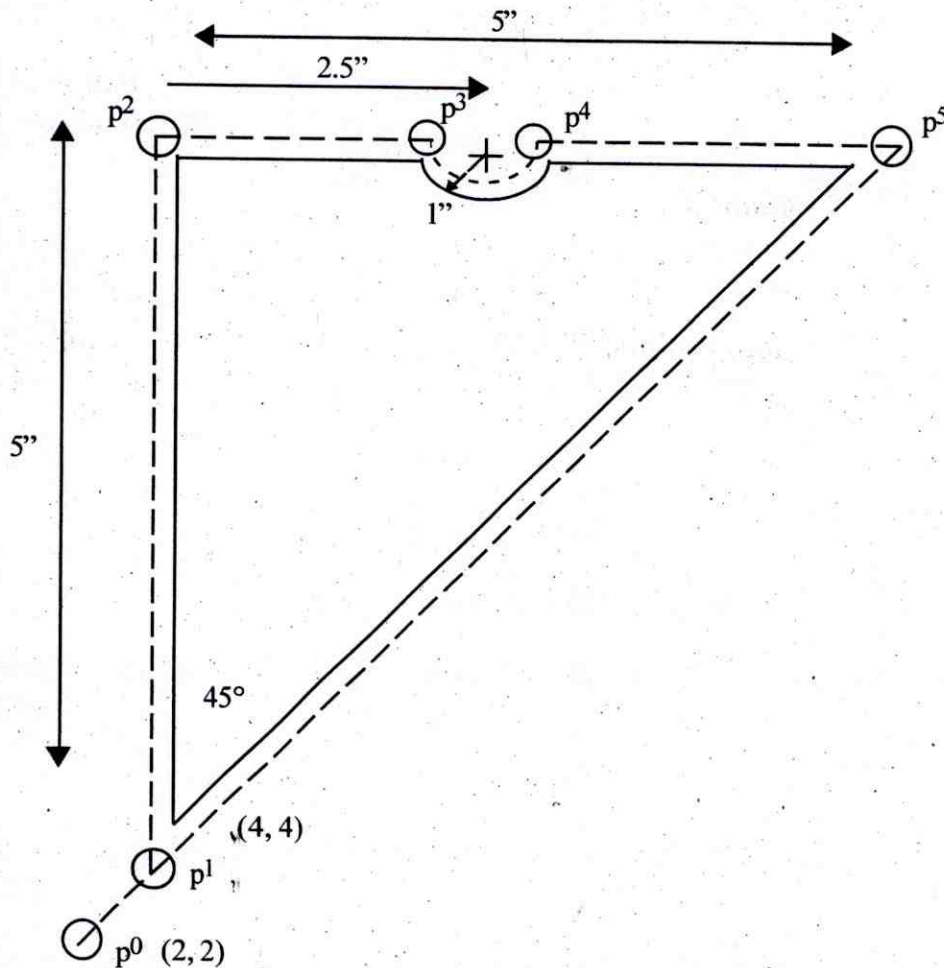
**Unit-II**

2. a) Differentiate CNC, direct NC and combined CNC/DNC system. (5)
- b) Explain the various functions of CNC. (6)
- c) Write various R&D opportunities in the conventional NC system for developing the advance NC system. (5)

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OR

2. a) Write the part programme for milling the side surfaces of the part given below. Given data : Tool size = 0.25 inch, Feed rate = 6 inch per minute, Cutting speed = 300 rpm, Tool start position : 2.0, 2.0, Programming in inches. Motion of tool is along the path  $p_0 \rightarrow p_1 \rightarrow p_2 \rightarrow p_3 \rightarrow p_4 \rightarrow p_5 \rightarrow p_1 \rightarrow p_0$ . (8)



- b) Explain various types of adaptive control systems. What are the various benefits of adaptive control systems? (4+4)

### Unit-III

3. a) Explain information flow system in retrieval type CAPP system. Enumerate various benefits of CAPP. (4+4)
- b) Write short note on computerized machinability data system and time standards. (8)

OR

3. a) Explain various parts classification systems. Explain various parts coding structures. (4+4)

- b) Explain OPITZ parts classification and coding system. (8)

**Unit-IV**

4. a) Explain the various functions of inventory management module of computer integrated production management system. Explain various configurations for process computer monitoring. (4+6)
- b) Differentiate between Direct Digital and Supervisory computer process control system. (6)

**OR**

4. a) Explain photogrammetry and machine vision inspection methods. (8)
- b) Explain various automated parts identification and data collection technologies. (8)

**Unit-V**

5. a) Explain various tests of flexibility in FMS. Also explain various types of flexibility in manufacturing. (4+4)
- b) Explain various functions of computer control system in FMS. (8)

**OR**

5. a) Explain extended enterprise and concurrent engineering concepts. Explain the three aspects of automation in brief. (2+2+4)
- b) Explain the various building blocks of lean manufacturing system. (8)





8E8072	Roll No. _____	8E8072	[Total No. of Pages : 1]
	B.Tech. VIII Semester (Main/Back) Examination, April/May-2017		
	Mechanical Engineering 8ME2A Laws for Engineers		

**Time : 3 Hours**

**Maximum Marks : 80**

**Min. Passing Marks : 26**

**Instructions to Candidates:**

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit-I**

1. Discuss the Fundamental rights and fundamental duties of Indian constitution. (16)

**OR**

1. Briefly enumerate the general principles of contracts under Indian contracts act 1872. (16)

**Unit-II**

2. Discuss the nature and concept of human rights. (16)

**OR**

2. a) Discuss the workmen's compensation Act 1923. (8)  
b) Write short notes on NHRC. (8)

**Unit-III**

3. Briefly discuss the evolution and concept of right to Information Act, 2005. (16)

**OR**

3. a) Explain the meaning of intellectual property. Discuss its main forms. (10)  
b) Write short notes on TRIPS. (6)

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**Unit-IV**

4. Discuss the law relating to trade-mark under trademark Act 1999. (16)

**OR**

4. What is a patent? Discuss the process of obtaining patent. (16)

**Unit-V**

5. Discuss the meaning, characteristics and types of a company. (16)

**OR**

5. Write short notes on election provisions under Indian constitution (Art 324-329). (16)



8E8073

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8E8073

**B.Tech. VIII Semester (Main/Back) Examination, April/May - 2017**  
**Mechanical Engineering**  
**8ME3A Power Generation**

**Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 26****Instructions to Candidates:**

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit-I**

1. a) A hydro-electric plant costs Rs 3000 per kW of installed capacity. The total annual charges consist of 5% as interest; depreciation at 2%, operation and maintenance at 2% and insurance, rent etc. 1.5%. Determine a suitable two-part tariff if the losses in transmission and distribution are 12.5% and diversity of load is 1.25. Assume that maximum demand on the station is 80% of the capacity and annual load factor is 40%. What is the overall cost of generation per kWh? (10)
- b) Prove that the load factor of a power system is improved by an increase in diversity of load. (6)

(OR)

1. a) What is meant by load curve? Explain its importance in power generation. (6)
- b) A power station has to meet the following demand : (10)

Group A : 200kW between 8 AM and 6 PM  
 Group A : 100kW between 6 AM and 10 AM  
 Group A : 50kW between 6 AM and 10 PM  
 Group A : 100kW between 10 AM and 6 PM and then between 6 PM and 6 AM  
 Plot the daily load curve and determine :

  - i) diversity factor
  - ii) load factor



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## Unit-II

2. a) Draw and explain a typical layout of Steam Power Plant. (8)
- b) Explain the effect of variations of steam condition on thermal efficiency of steam power plant. (8)

(OR)

2. a) Describe the various methods used to control the degree of superheat. Name the advantages gained by using super-heat steam. (8)
- b) State the advantages and disadvantages of a steam power station as compared to hydroelectric power station and nuclear power station. (8)

## Unit-III

3. a) State the applications of a diesel power plant? (8)
- b) Given the advantages and limitations of gas turbine power plant. (8)

(OR)

3. a) Explain the typical layout of a hydro electric power plant with a neat sketch. (8)
- b) What are the advantages of Pelton for very high heads? What are the disadvantages of low speed reaction turbine for the same conditions? (8)

## Unit-IV

4. a) Determine the diameter of the wind mill required to develop 500 kw power. The wind speed available at the site is 10m/s and power coefficient is 0.45. Find the power produced by the wind mill per year if its effective use is 2500 hrs per year, also find the torque when the motor is rotating at 300 RPM. (10)
- b) What is aerofoil? Explain its importance in wind power generation. (6)

(OR)

4. a) Discuss the merits of horizontal-axis wind machines and the vertical-axis wind machines. Under what circumstances vertical-axis wind machines is preferred over horizontal-axis wind machines? (10)
- b) Explain the environmental factors associated with wind power generation. (6)

**Unit-V**

5. a) List out the advantages and disadvantages of concentrating collector over flat plate collectors. (8)
- b) Explain the working of solar photo-voltaic cell. What are the major advantages and disadvantages of solar photo-voltaic system. (8)

(OR)

5. a) Define following term and explain their significance : (8)
- i) Sun's Declination angle
  - ii) Hour angle
  - iii) Sun's altitude angle
- b) Finding at what time (clock time) is the solar noon in a place whose local meridian is  $L_{loc} = 110^{\circ}28''E$ , and standard meridian is  $L_{st} = 120E$ , on July 21? (8)







8E8074	Roll No. _____	[Total No. of Pages : 2]
	<b>8E8074</b>	
	<b>B.Tech. VIII Semester (Main/Back) Examination, April/May - 2017</b>	
	<b>Mechanical Engineering</b>	
	<b>8ME4.1A Product Development and Launching</b>	
<b>Time : 3 Hours</b>		<b>Maximum Marks : 80</b>
		<b>Min. Passing Marks : 26</b>

**Instructions to the Candidates:**

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit-I**

1. a) What is new product and explain the process of development of a new product? (8)
- b) Explain any two : (8)
  - i) Market pull product
  - ii) Technology push product
  - iii) Platform based product

(OR)

1. a) What is the importance of new product for growth of the enterprise? (8)
- b) What are the demands of product development team? (8)

**Unit-II**

2. a) What is need analysis? How it is completed. (8)
- b) Briefly explain the engineering statement of problem. (8)

(OR)

2. a) Explain the economic existence of need. (8)
- b) Point out the location of target specification in concept development process and explain the process of target specification. (8)

**Unit-III**

3. a) Explain fear of criticism and psychological set in case of a new product. (8)  
 b) Explain Brain storming process of idea generation. What is inversion process. (8)

**(OR)**

3. a) Discuss in detail concept generation. (8)  
 b) How we establish engineering specification of a new product. Explain requirements and specification's role in system design. (8)

**Unit-IV**

4. a) What is design for manufacturing? Explain preparation of assembly drawing. (8)  
 b) If you are a design engineer then specify the role of ergonomics and aesthetics while developing a new product. (8)

**(OR)**

4. a) How can we identify subsystem? Explain subsystem specification. (8)  
 b) Discuss any two : (8)  
 i) Simplification in design  
 ii) Standardization in design  
 iii) Modular design

**Unit-V**

5. a) What are the challenges faced in managing the development and launching of a new product? Give example. (8)  
 b) Discuss new product launch strategy. (8)

**(OR)**

5. a) Explain the following : (8)  
 i) Project scheduling  
 ii) Project task matrix  
 b) Briefly explain the organization of design team. (8)





8E4050	Roll No. _____	[Total No. of Pages : 2]
	<b>8E4050</b>	
	<b>B.Tech. VIII Semester (Back) Examination, April/May - 2017</b> <b>Mechanical Engineering</b> <b>8ME2 (O) Operations Management</b>	

**Time : 3 Hours**

**Maximum Marks : 80**

**Min. Passing Marks : 26**

**Instructions to the Candidates:**

*Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit - I**

1. a) Define productivity. Explain the various factors affecting productivity. (8)
- b) Discuss the scope of operation management. What are the duties of operation manager in manufacturing industries? (8)

**OR**

1. a) What is demand forecasting? Explain the various methods of forecasting. (8)
- b) Calculate forecast for 2016 by weight moving average (WMA) and simple moving average (SMA) using following data, (8)

Year	2013	2014	2015
Actual Demand	1050	1150	1250
Weightage	1	2	3

**Unit - II**

2. a) Explain the various types of production system with suitable examples. (8)
- b) What is process planning? Explain various steps followed in process planning. (8)

**OR**

2. a) Define capacity planning. Explain various steps followed in capacity planning process. (10)
- b) Explain cost volume analysis in detail. (6)

**Unit - III**

3. a) What are the objectives and functions of production planning? (6)  
 b) What is aggregate planning? Explain aggregate planning strategies. (10)

**OR**

3. a) Explain the master production schedule with neat sketch. (8)  
 b) Explain MRP (Material requirement planning) and MRP-II (Manufacturing resources planning). (8)

**Unit - IV**

4. Explain the followings in detail :

- a) Routing. (4)  
 b) Scheduling. (4)  
 c) Expediting. (4)  
 d) Follow up. (4)

**OR**

4. a) Explain the technique of production control in batch production and mass production. (10)  
 b) What are objectives and functions of production control system. (6)

**Unit - V**

5. a) What is procurement of material? Explain various steps followed in procurement of material. (8)  
 b) Explain the objectives and functions of material management. (8)

**OR**

5. a) What is inventory control system? Explain various inventory control system. (8)  
 b) A company buys its annual requirement of 40000 units in 8 installments. Each unit cost is Rs. 2 and ordering cost is Rs. 30. The inventory carrying cost is estimated as 30% of unit value. Find the total annual cost of the existing inventory policy. How much money can be saved by the economic order quantity? (8)





8E4051

Roll No. \_\_\_\_\_

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8E4051

**B.Tech. VIII Semester (Old Back) Examination, April/May - 2017****Mechanical Engg.****8ME3 Gas Turbine & Gas Power Plant****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 26****Instructions to the Candidates:**

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

**Unit - I**

1. a) What is the purpose of adding heat exchanger? Draw the schematic diagram of a simple cycle with heat exchanger & Explain briefly with P-V & T-S diagram. (8)
- b) In an Ideal gas Turbine with reheat, air at state  $(P_1, T_1)$  is compressed to pressure  $rp_1$  & heated to  $T_3$ . The air is then expanded in two stages, each turbine having same pr. ratio, with reheat to  $T_3$  between the stages. Assume working fluid to be perfect gas with constant specific heat & compression. Expansion are isentropic, then show that specific work output will be maximum. (8)

$$\text{If } r = (t)^{\frac{2}{3a}} \text{ where } t = \frac{T_3}{T_1} \text{ \& } a = \frac{\gamma-1}{\gamma}.$$

**OR**

2. a) Derive the expression for specific work output and efficiency of a simple cycle with Intercooler, heat exchange & reheat. Draw their trends as a function of pressure ratio. (8)
- b) In a gas Turbine the pressure ratio to which air at  $15^\circ\text{C}$  is compressed to 6. The same air is then heated to maximum temp.  $750^\circ\text{C}$ , First in a heat exchanger & then combustion chamber. It is then expanded in two stages such the expansion work is maximum. The air is reheated to  $750^\circ\text{C}$  after the first stage.

Determine the cycle thermal efficiency, work ratio  $\left(\frac{W_N}{W_T}\right)$  & network per kg of air. (8)



## Unit - II

3. a) Define polytropic efficiency. Derive suitable expression for polytropic Efficiency & bring out the relation between the polytropic efficiency & Isentropic efficiency. (8)
- b) In a gas turbine plant air enters the compressor at 1 bar & 7°C it is compressed to 4 bar with an Isentropic efficiency of 82%. The maximum temperature at the inlet to the turbine is 800°C. The isentropic efficiency of the turbine is 85%. The calorific value of fuel used is 43.1 kJ/kg. The heat losses are 15% of C.V. Calculate following. (8)
- |                                |                    |
|--------------------------------|--------------------|
| i) Compressor work             | ii) Heat supplied  |
| iii) Turbine work              | iv) Net work       |
| v) Thermal efficiency          | vi) Air/Fuel ratio |
| vii) Specific fuel consumption | viii) $W_c/W_T$    |

Assume  $C_{pa} = 1.005 \text{ KJ/kg K}$ ,  $\gamma_a = 1.4$ ,  $C_{pg} = 1.147 \text{ KJ/kg K}$ ,  $\gamma_g = 1.33$ .

## OR

4. a) Explain briefly : (10)
- Pressure & flow losses.
  - Effect of Variable Sp. heat.
  - Mechanical losses
  - Loss due to Incomplete combustion
- b) The efficiencies of compressor & Turbine of gas turbine are 70.42% & 71% respectively. The heat added in the combustion chamber per kg of air is 476 kJ/kg. Find suitable pressure ratio such that the work ratio is 0.055, also find the corresponding temp. ratio. The inlet total temperature of air is 300 K. (6)

## Unit - III

5. a) How the gas turbine engine is classified. Discuss Ramjet engine with neat diagram. Draw FS diagram, also draw performance Curves. (8)
- b) Air enters a turbojet engine at a rate of  $12 \times 10^4 \text{ kg/h}$  at 15°C and 1.03 bar and is compressed adiabatically to 182°C & four times the pressure. Products of combustion enter the Turbine at 815°C and leave it at 650°C to enter the nozzle. Calculate isentropic efficiency of compressor, the power required to drive compressor, the exit speed of gases & Thrust developed when flying at 800 km/h. Assume Isentropic efficiency of turbine is same as compressor & nozzle efficiency is 90%. (8)

OR

6. a) With a neat sketch & T-S diagram, explain working of turbojet engine. Also derive expression for thrust developed. (8)
- b) Explain various efficiencies associated with a propulsion device. (8)

## Unit - IV

7. a) What are the factors which affecting the Combustion Chamber Design & Performance. (8)
- b) With a neat sketch explain the combustion chamber geometry bringing out the various zones that play a part in the process of combustion. (8)

OR

8. a) Gas at 7 bar & 300°C. Expands to 3 bar in an impulse turbine stage, The nozzle angle is 70° with reference to exit direction. The rotor blades have equal Inlet and outlet angles, and the stage operates with the optimum blade speed ratio. Assume that Isentropic Efficiency of the nozzles is 0.9. and velocity at Entry to the stage is negligible, deduce the blade angle used and mass flow required for this stage to produce 75kw,  $C_p = 1.15 \text{ kJ/kg K}$ . (8)
- b) How do you differentiate between Impulse & reaction turbine? With neat sketch Explain the working of impulse & reaction stage. (4)
- c) Define degree of reaction & Derive an expression for the same. (4)

## Unit - V

9. Write short note on : (4×4=16)
- a) Free piston engine plant.
- b) Gas Turbine materials.
- c) Gas Turbine blading & fuels.
- d) Advantages of gas Turbine power plant.

OR

10. a) What are the methods for improving part load performance of gas turbine. (8)
- b) Describe following terms. (8)
- i) Part load efficiency.
- ii) Air flow rate
- iii) Thermal efficiency of gas turbine power plant.

