

8E4049

Roll No. _____

[Total No. of Pages : 3]

8E4049**B.Tech. VIII Semester (Old/Back) Examination, April/May 2016****Mechanical Engineering****8ME1(O) Renewable Energy Technology****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****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 suitably be assumed and stated clearly.)

Units of quantities used/calculated must be stated clearly

Unit - I

1. What are the advantages of use of renewable sources of energy. Discuss different renewable sources of energy with special reference to India (16)

OR

1. a) Draw the basic block diagram for solar photovoltaic power plant and explain (8)
- b) Discuss various types of solar collectors. How is the Performance of a concentrating Collector evaluated. (8)

Unit - II

2. a) Discuss various merits and demerits of wind energy power generation (8)
- b) Explain the working of vertical axis wind mill with suitable diagram (8)

OR

2. a) Discuss the characteristics and applications of WECS (8)
- b) A propeller type, horizontal shaft wind turbine having following wind characteristics:
- speed of wind 10m/s at 1 atm and 15°C. (8)
- The turbine has diameter of 120m and its operating speed is 40 r.p.m at maximum efficiency. Calculate
- Total power density in the wind stream
 - Max obtainable power density assuming $\eta = 40\%$
 - Total Power Produced in kW.
 - Torque and axial thrust.

Unit - III

3. Explain with the help of diagram the principle of closed cycle OTEC system. Discuss its advantages and limitations. (16)

OR

3. a) Discuss the classification of Tidal power plant. (8)
- b) Write short notes on :- (8)
- Progressive wave
 - Tidal wave energy

Unit - IV

4. a) Differentiate between geothermal power plant and thermal power plant. (8)
- b) Explain thermoelectric power generator (8)

OR

4. Draw schematic diagram of an MHD power generating system having heat recovery steam generator. Explain the functioning of the system (16)

Unit - V

5. a) What is a fuel cell. Differentiate between a fuel cell and a battery (8)
b) Explain how a fuel cell generate heat (8)

OR

5. a) Describe the principle of working of H_2 - O_2 cell. Give its limitations (8)
b) Explain the method of production of hydrogen cell. (8)
-

8E4050	Roll No. _____	[Total No. of Pages : 3]
	8E4050	
	B.Tech. VIII Semester (Old/Back) Examination, April/May 2016	
	Mechanical Engineering	
	8ME2 Operations Management	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

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 suitably be assumed and stated clearly.)

Units of quantities used/calculated must be stated clearly

Unit - I

1. a) Discuss the scope of operations management. What is the role of Operation's Manager? (5+3=8)
- b) Discuss operations strategy and competitiveness taking suitable examples (4+4=8)

OR

1. a) Define forecasting. What are its applications? Discuss the steps of Delphi method (2+2+4=8)
- b) A firm believes that its annual profit depends on its expenditures for research the information for the preceding six years is given below. Estimate the profit when the expenditure is 6 units using least square method of forecasting. (8)

Year	1	2	3	4	5	6	7
Expenditure for research(X)	2	3	5	4	11	5	6
Annual Profit(Y)	20	25	34	30	40	31	?

5

T

Unit - II

2. a) Briefly discuss different products and services with suitable examples(4+4=8)
b) Explain product and process matrix in detail (8)

OR

2. a) Define productivity. what are its types. Discuss different methods of improving it (2+3+3=8)
b) Distinguish between design capacity and system capacity. Also explain different long term and short - term capacity strategies. (4+4=8)

Unit - III

3. a) What is MRP II? Explain the help of a block diagram (3+5=8)
b) List and briefly discuss different phases of production planning and control (8)

OR

3. a) What do you mean by BOM? Give an example? What are the basic inputs for MRP? (4+4=8)
b) Consider the following 2 machines and 5 jobs flow job scheduling problem. Using Johnson's algorithm obtain the optimal sequence which will minimize the makespan.

Job(i)	1	2	3	4	5
Machine 1	7	1	15	8	11
Machine 2	8	4	12	5	6

(8)

Unit - IV

4. a) what do you mean by control phase? What are activities under this phase? Explain them in brief (3+2+3=8)
b) Write short notes on the following
i) Routing
ii) Scheduling
iii) Dispatching
iv) Expediting (2x4=8)

OR

4. a) Differentiate between capacity control and priority control taking suitable examples (8)
b) What are different techniques of production control in mass production Explain taking an example of a production plant. (4+4=8)

Unit - V

5. a) What are the objectives and functions of material management? Explain them in brief (4+4-8)
b) What are selective inventory control systems? What are their advantages (8)

OR

5. a) List and explain different types of costs in inventory system (8)
b) What is lead time? Explain its significance and importance in inventory control (8)
-

8E8072	Roll No. _____	[Total No. of Pages : 2]
	8E8072	
	B.Tech. VIII Semester (Main/Back) Examination, April/May 2016 Mechanical Engg. 8ME2A Laws for Engineers	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

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 suitably be assumed and stated clearly.)

Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Discuss the fundamental right with their applicability for individual and write directive principles provided by the state policy (8)
- b) Explain the general principles of contract Act 1872, with applicability in industry practice (8)

OR

1. a) Discuss the kinds of government contracts with their features and guideline for industry (8)
- b) Explain the principles of protection against possibility of exploitation and judicial approach to such contracts (8)

Unit - II

2. a) Write details of workers compensation Act 1923, write three different accidental cases in a chemical company (8)
- b) Explain covenant on civil & political rights 1966 with optional protocol-I and protocol-II (8)

OR

2. a) Distinguish between human rights in Indian tradition and western tradition (8)

- b) Explain industrial dispute Act 1947 with two examples of disputes in industrial practice. Also explain the mechanisms for disputes settlement (8)

Unit - III

3. a) Explain the historic evaluation, concept and procedure of right to information (8)
- b) Industrial revolution is accelerated by information technology Advancement justify your answer with support of industrial advancement in any sector (8)

OR

3. a) How cyber crime is a significant problem in the information technology? Explain the issues related to cyber crime and their measures for investigation. (8)
- b) How intellectual property rights are applicable for protection of industrial techniques or function? Write the key features in relation to copy right (8)

Unit - IV

4. a) Explain the key features of trademark Act 1999 (8)
- b) Distinguish between trademark and property mark (8)

OR

4. a) Explain the features and terms related to patent Act 1970 and how it is used in software protection in computers (8)
- b) Write the patentable inventions with special reference to biotechnology (8)

Unit - V

5. a) Explain the role of MNC's in India for make in India vision (8)
- b) Define company. Describe the various types of companies as per companies Act 1956 (8)

OR

5. a) Explain the FEMA Act 1999 with respect to an industry (8)
- b) Discuss the candidate electoral rights. Also write about the prevention of Corruption Act 1988. (8)

8E8071	Roll No. _____	[Total No. of Pages : 2]
	8E8071	
	B.Tech. VIII Semester (Main) Examination, April/May 2016 Mechanical Engg. 8ME1A Computer Integrated Manufacturing Systems	

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

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 suitably be assumed and stated clearly.)*

Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain various components of CIM (6)
- b) What is NC system? Also discuss the different methods of listing the coordinates of points in NC system (10)

OR

1. a) Discuss the role of CIM in manufacturing, manufacturing planning and manufacturing control (8)
- b) Discuss various controls used in CNC machines Explain the principle of operation of closed loop CNC machine (8)

Unit - II

2. a) Explain manual part programming with suitable example (8)
- b) Explain NC application characteristics & NC part programming in detail (8)

OR

2. a) Explain NC Cutter path verification (8)
- b) Discuss in brief on interfacing NC with CIM (8)

10

Unit - III

3. a) Define group technology. List out various stages in GT and the methods available for solving problems in GT (8)
- b) Define part families. Explain the two categories of attributes of parts (8)

OR

3. Define the term process planning. Discuss various steps involved in process planning and its prerequisites (16)

Unit - IV

4. a) Discuss optical and non optical computer aided testing method. Discuss how computer is used in quality control (8)
- b) Discuss non contact inspection methods and different activities in a PPC system (8)

OR

4. Write short notes on
- a) MRP II
- b) Computer process control
- c) Contact inspection method (16)

Unit - V

5. a) What difficulties do companies interested in implementing CIM face (8)
- b) Compare agile and lean manufacturing (8)

OR

5. What is FMS? Describe the principle of FMS. Discuss the importance of material handling system in FMS (16)
-

8E8073	Roll No. _____	[Total No. of Pages : 3]
8E8073 B.Tech. VIII Semester (Main/Back) Examination, May 2016 Mechanical Engg. 8ME3 A Power Generation		

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

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 suitably be assumed and stated clearly.)

Units of quantities used/calculated must be stated clearly

Unit - I

1. a) Define the following terms :
 - i) Load factor
 - ii) Plant factor
 - iii) Demand factor
 - iv) Diversity factor
 - v) Reserve factor (2×5=10)
- b) What is present worth concept? How it is estimated (2+4=6)

OR

1. a) A thermal power plant of 210 MW capacity has the maximum load of 160 MW. Its annual load factor is 0.6. The coal consumption is 1 kg per kWh of energy generated and the cost of coal is Rs. 450 per tonne. Calculate
 - i) The annual revenue earned if energy is sold at Re 1 per kWh
 - ii) The capacity factor of the plant (5+3=8)
- b) What are the considerations to be made while selecting the location for a thermal power plant (8)

Unit - II

2. a) Discuss various efficiencies for studying the performance of a steam turbine plant (8)
- b) Explain the effect of variation of steam condition on thermal efficiency of steam power plant (8)

OR

2. Sketch the layout of a steam of steam power plant and explain the following
- i) coal & ash circuit
 - ii) air & gas circuit
 - iii) feed water & steam flow circuit
 - iv) cooling water circuit
- (8+2+2+2+2=16)

Unit - III

3. a) What are the advantages and disadvantages of gas turbine power plant over diesel power plant (6)
- b) Discuss the performance characteristics of a gas turbine power plant (10)

OR

3. a) Enumerate and explain briefly the essential elements of hydroelectric power plant (10)
- b) A turbine is to operate under a head of 24m at 200 rpm. The discharge is 8.5 m³/s. If the overall efficiency is 88%, determine
- i) power generated
 - ii) specific speed of the turbine
 - iii) type of turbine

(2+2+2=6)

Unit - IV

4. a) What do you understand by teetering of rotor? In what cases it is required? (4+2=6)
- b) Explain the following terms:
- i) drag force
 - ii) lift force
 - iii) pitch angle
 - iv) chord
 - v) angle of attack
- (2x5=10)

OR

4. a) Define the term "solidity". Explain the major applications of wind power (2+8=10)
- b) A horizontal axis wind turbine(HAWT) is installed at a location having free wind velocity of 15m/s. The 80m diameter rotor has three blades attached to the hub. Find the rotational speed of the turbine for optimal extraction(6)

Unit - V

5. a) Describe the principle of solar photo-voltaic energy conversion (6)
- b) Classify different types of solar thermal collectors and explain the working of liquid flat plate collector with necessary sketch. (10)

OR

5. Write short notes on any four

- a) pyranometer
- b) pyreheliometer
- c) solar time
- d) compound parabolic concentrator
- e) solar PV applications
- f) solar cookers

(4×4=16)

Roll No. _____

[Total No. of Pages : 3]

8E4051**8E4051****B.Tech. VIII Semester (Old Back) Examination, April /May 2016****Mechanical Engg.****8ME3(O) Gas Turbine and Gas Power Plant****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****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 suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain the effect of intercooling, reheating and heat recovery heat exchanger on net work output and efficiency (Thermal) of a simple gas turbine cycle (6)
- b) The ratio of network to turbine work of an ideal gas turbine plant is 0.563. Take the inlet temperature to the compressor as 300K. Calculate the Temperature drop across the turbine if the thermal efficiency of the unit is 35%. Assume a mass flow rate of 10Kg/s, $C_p = 1$ KJ/kg and $\gamma = 1.4$ (10)

OR

1. a) Write the advantage and disadvantage of gas turbine in comparison to reciprocating engines (8)
- b) A gas turbine plant operates between 5°C and 839°C find
 - i) The pressure ratio at which cycle efficiency equals Carnot cycle efficiency
 - ii) Pressure ratio at which maximum work is obtained (4+4)

Unit - II

2. a) What is the concept of polytropic efficiency and why it is employed (6)

- b) An oil gas turbine installation consists of a compressor, a combustion chamber and turbine. The air taken in at a pressure of 1 bar and temperature of 30°C is compressed to 6 bar with an isentropic efficiency of 87%. Heat is added in combustion chamber to raise the temperature to 700°C . The efficiency of the turbine is 85%. The calorific value of the oil used is 43.1 MJ/kg. Calculate for an air flow of 80 kg/min. Neglect the effect of fuel in the mass flow rate.
- i) The net power of installation
- ii) The overall thermal efficiency of the installation (10)

OR

2. A 1850 kW open cycle gas turbine plant is to have one inter cooler one reheater and a regenerator. on one shaft the high pressure turbine drives the low pressure compressor on another shaft the low pressure turbine drives the high pressure compressor and the load.

The following is the data:

Ambient pressure = 1 bar:

Ambient temperature = 27°C

Maximum cycle temperature = 720°C

Pressure ratio at each stage of compression = 2.5

Turbine and compressor efficiencies = 80%

Pressure drop in each heater and each side of regenerator = 3%

Regenerator effectiveness = 75%

Assuming intercooling to ambient temperature and reheating to maximum temperature

sketch T-S diagram and index all state points. Calculate these state points and the necessary ideal states. Calculate the thermal efficiency and power output of each turbine and compressor (16)

Unit - III

3. a) Explain the effect of heat exchanger effectiveness and high fluid velocities on gas turbine and how their effect can be accommodated (8)
- b) Explain the working of a pulse jet engine with a neat sketch (8)

OR

3. a) Explain rocket and air breath engines. why rocket engine are needed (8)
- b) A turbojet power plant uses aviation kerosene having a calorific value of 43 MJ/kg. The fuel consumption is 0.18 kg per hour per N of thrust, when thrust is 9 kN the air craft velocity is 500 m/s. The mass of air passing through the compressor is 27 kg/s. Calculate the air fuel ratio, thrust power and overall efficiency. (8)

Unit - IV

4. a) What are the requirements which a good combustion chamber must fulfill (8)
- b) Explain the process of combustion in a gas turbine combustion chamber (8)

OR

4. a) Mention the various practical problems in the operation of a combustion chamber (6)
- b) In a single stage impulse turbine the nozzle discharge the fluids on the blades at an angle of 65° to the axial direction and the fluid leaves the blade with an absolute velocity of 300 m/s at an angle of 30° to the axial direction. If the blades have equal inlet and outlet angles and there is no axial thrust, calculate the blade angle, power produced per kg/s of the fluid and the blade efficiency (10)

Unit - V

5. a) Compare gas turbine power plant with steam and hydel power plant (8)
- b) What are the requirements for blade cooling (8)

OR

5. Write short notes on following: (any two)
- a) Gas turbine materials
- b) Free piston engine plant
- c) Part load efficiency of gas turbine power plant (8×2)

8E8074	Roll No. _____	Total No. of Pages : 2
	8E8074	
	B.Tech. VIII Semester (Main) Examination, May 2016	
	Mechanical Engineering	
	8ME4.1A Product Development and Launching	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

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 suitably be assumed and stated clearly.)

Units of quantities used/calculated must be stated clearly

Unit - I

1. Explain in detail the generic product development process for a market pull product (16)

OR

1. a) Differentiate between 'Need based development' and 'Technology based development' with suitable examples (4)
- b) Explain with diagram the various stages involved in product life cycle. Also highlight its importance in context of product design (12)

Unit - II

2. Describe the process of economic justification in the early stages of new product development (16)

OR

2. How need identification and analysis of alternatives generated is done during product development? Explain in detail (16)

Unit - III

3. a) Differentiate between creative idea and innovation with suitable examples (6)
 b) Explain briefly the following :
 i) Concept feasibility (5)
 ii) Concept selection (5)

OR

3. Describe the main tools of creativity that an organization can use to generate innovative and creative product ideas (16)

Unit - IV

4. a) What are the principal requirements of a good product design (6)
 b) Describe the various ergonomical and aesthetical considerations which are useful in product design (10)

OR

4. Describe in detail the process to review a product design from manufacturing point of view. (16)

Unit - V

5. Discuss in detail the major challenges faced by an organization which aims to generate a new product (16)

OR

5. Write short note on
 i) Acid test (8)
 ii) Design structure matrix(DSM) (8)