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06ME81

**Eighth Semester B.E. Degree Examination, June/July 2011  
Industrial Management**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. Explain the contributions of F.W. Taylor's and Henry Fayol to the evolution of management science in the Indian context. (10 Marks)
- b. List the types of ownership of industries and explain the salient features, advantages disadvantages and applications of proprietorship and partnership firms. (10 Marks)
- 2 a. Define TQM and list the benefits of TQM. (07 Marks)
- b. Discuss in details the following:
  - i) Internal failure costs ii) External failure costs iii) Prevention costs iv) Appraisal costs. (08 Marks)
- c. Define value engineering. Explain the method / technique / procedure for value engineering. (05 Marks)
- 3 a. What are control charts for variables? Explain the  $\bar{X}$  and R charts. (10 Marks)
- b. Briefly explain the different control charts for attributes. (10 Marks)
- 4 a. Define method study and list the method study procedures. (04 Marks)
- b. Briefly explain the principles of "Motion Economy". (06 Marks)
- c. With neat sketch explain the following with examples:
  - i) Man-Machine charts. ii) Operation/ Process charts. iii) Two handed charts. (10 Marks)

**PART – B**

- 5 a. Explain briefly the Hawthorns studies and its findings. (06 Marks)
- b. Discuss the Maslow's theory of hierarchy of human needs. (08 Marks)
- c. Explain Frederick Herzberg's motivation Hygiene theory. (06 Marks)
- 6 a. Explain the contribution of Elton Mayo to human relations management. (06 Marks)
- b. Briefly discuss the important characteristics or skills of manager at various levels in an organization. (07 Marks)
- c. List and explain the functions of a manager in an organization. (07 Marks)
- 7 a. Discuss the process choice in service and manufacturing sector. (08 Marks)
- b. Explain the customer involvement in an organization and also mention the advantages and disadvantages. (06 Marks)
- c. Discuss the term vertical integration and explain how it helps to minimize the production cost in an organization. (06 Marks)
- 8 a. Discuss the primary areas covered by the technology management and role of technology management in improving business performance. (10 Marks)
- b. Write short notes on:
  - i) Research and Development stages.
  - ii) Invention and Innovation. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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06ME82

**Eighth Semester B.E. Degree Examination, June/July 2011**  
**Hydraulics and Pneumatics**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions selecting at least TWO questions from each part.**  
**2. Draw neat sketches wherever necessary.**

**PART – A**

- 1 a. Sketch and explain the working of a balanced vane pump. (08 Marks)  
b. List six basic components required in a hydraulic power system and state the essential functions of each. (06 Marks)  
c. A vane pump has a volumetric displacement of  $90\text{cm}^3$ . It has rotor dia of 5.0 cm. and cam ring dia of 7.5cm and a vane width of 5.0 cms. What must be the eccentricity? (06 Marks)
- 2 a. With a neat sketch, explain the operation of swash plate put on motor in hydraulic system. (06 Marks)  
b. Describe 'end cushion' provided in air cylinder with a neat sketch. (06 Marks)  
c. A hydraulic motor has a displacement volume of  $130\text{cm}^3$  per revolution and operates with a pressure of 105 bar and a speed of 2000 rpm, actual flow rate consumed by rotor is 5.00 LPS and actual flow torque delivered by motor is 200 N-m, find : i) Volumetric efficiency ; ii) Mechanical efficiency ; iii) Overall efficiency. (08 Marks)
- 3 a. Explain with a neat sketch, the principle of working of a pilot operated pressure relief valve. Draw graphic symbol for the valve. (10 Marks)  
b. Describe the working principle along with graphic symbol of the following :  
i) Sequence valve ; ii) Counter balance valve. (10 Marks)
- 4 a. Explain with a neat circuit diagram, the working of a meter out circuit for controlling the speed of a cylinder. State its advantages and disadvantages. (10 Marks)  
b. Describe with a neat diagram, the construction and working of a spring loaded accumulator – state its disadvantages. (10 Marks)

**PART – B**

- 5 a. How are hydraulic seals classified? What is meant by positive and non positive seal? (06 Marks)  
b. What are the effects of solid contaminant? Explain with a simple sketch influence of contaminant on lubricating fluid. (06 Marks)  
c. Name three types of fluid generally accepted by fluid power system. Why water is not suitable media in fluid power system? What are the prime functions of fluid? (08 Marks)

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- 6 a. Define pneumatic actuator. How are they classified? (04 Marks)  
b. What is meant by double acting cylinder? Explain with a neat diagram, the constructional feature and working principle of double acting cylinder. (08 Marks)  
c. What is meant by rotary actuator? Name its basic forms? Explain them with neat diagram. (08 Marks)
- 7 a. Define control diagrams. Name the recommended procedure for drawing control diagram. (04 Marks)  
b. What do you mean by quick exhaust valve? Explain its working principle, with a neat sketch. (08 Marks)  
c. Explain with a pneumatic circuit, the control of extension of double acting cylinder using OR and AND logic gates. (08 Marks)
- 8 Write short notes on :  
a. Accumulator as emergency power source.  
b. Electro – pneumatic control.  
c. Hydraulic cylinder sequencing circuit diagram.  
d. Radial pump. (20 Marks)

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PART - II

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06ME831

### Eighth Semester B.E. Degree Examination, June/July 2011

### Tribology

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer FIVE full questions selecting at least TWO questions from each part.**  
**2. Reference of design data handbook is permitted.**

#### PART – A

- 1 a. Derive Hagen-Poiseuille law. State the assumptions. (12 Marks)  
 b. The diameter of a capillary tube connecting two reservoirs is 0.025 cm and its length is 160 cm. The viscosity of oil filling the system is 24.1cp. Determine the difference between pressure in reservoirs A and B if maximum velocity of flow at the centre line of capillary is equal to 8 m/min. (08 Marks)
- 2 a. Derive Petroff's equations for lightly loaded bearings. State the assumptions. (08 Marks)  
 b. Determine load carrying capacity, frictional force and power loss due to friction for an ideal full journal bearing having following specifications.  
     diameter of journal = 5 cm                      length of bearing = 6.5 cm  
     speed of journal = 1200 rpm                  radial clearance = 0.0025 cm  
     average viscosity =  $1.6 \times 10^{-6}$  Reynolds      attitude = 0.8. (06 Marks)  
 c. Write a short note on Tower's experiments. (06 Marks)
- 3 Derive Reynold's equation in 2D. State the assumptions. (20 Marks)
- 4 a. Derive an expression for load carrying capacity of a plane slider bearing with fixed shoe. (12 Marks)  
 b. A slider bearing with a rectangular pivoted shoe has the following specifications.  
     length of shoe in the direction of motion = 75 mm,  
     width of shoe = 112 mm,  
     velocity of moving member = 200 mm/s,  
     viscosity of fluid = 32 cp,  
     permissible minimum oil film thickness = 0.0255 mm.  
     Assume inclination of bearing corresponding to  $q = 1.2$ .  
     Determine : i) Load carrying capacity  
                   ii) Power loss in bearing  
                   iii) Coefficient of friction  
     Take into consideration the influence of end leakage on the performance of the bearing. (08 Marks)

#### PART – B

- 5 a. Write a note on thermal equilibrium of journal bearing. (08 Marks)  
 b. An oil ring full journal bearing is to operate in still air. The bearing diameter is 75 mm and length is 75 mm. Bearing is subjected to a load of 5 kN and is rotating at 500 rpm. Radial clearance is 0.0625 mm. The oil is SAE 30 and ambient temperature is 20°C. Determine the equilibrium temperature and viscosity of oil. (12 Marks)

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- 6 a. Derive an expression for load carrying capacity of hydrostatic step bearing. State the assumptions. (12 Marks)
- b. A hydrostatic thrust bearing has the following specifications.  
vertical thrust = 60 kN,  
shaft diameter = 500 mm  
pocket diameter = 300 mm,  
viscosity = 35 cp,  
film thickness = 0.01 mm.  
Determine : i) Rate of oil flow through the bearing  
ii) Power loss due to viscous friction. (08 Marks)
- 7 a. Write a note on properties of bearing materials. (08 Marks)
- b. Define wear. Name the different types of wear. (04 Marks)
- c. Explain erosive wear with examples. (08 Marks)
- 8 a. Discuss improved selection of materials and surface engineering as the tribological measures in improving tribological behaviour of materials. (10 Marks)
- b. Write short notes on wear of :  
i) Polymers  
ii) Ceramic materials. (10 Marks)

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06ME843

**Eighth Semester B.E. Degree Examination, June/July 2011**

**Biomass Energy Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions selecting  
at least TWO questions from each part.**

**PART - A**

- 1 a. What are the advantages of energy plantation? (10 Marks)  
b. Classify the availability of biomass resources with suitable examples. (10 Marks)
- 2 a. Explain different stages of methane production by anaerobic digestion method. (10 Marks)  
b. What are the various factors affecting bio-digestion. (10 Marks)
- 3 a. Outline the general features of pelletization process with a flow chart and discuss their design aspects. (10 Marks)  
b. Write a brief note on briquetting process. (05 Marks)  
c. Discuss the heat content of various fuels. (05 Marks)
- 4 a. Enumerate the typical composition of the gas obtained from wood gasification. (08 Marks)  
b. Classify biomass gasifiers based upon the direction of gas flow. Draw a neat sketch of a down draft gasifiers and explain their functions. (12 Marks)

**PART - B**

- 5 a. What is anaerobic digestion? What are the advantages of anaerobic digestion? (05 Marks)  
b. Draw a neat sketch of a KVIC digester. Explain its construction and working. (15 Marks)
- 6 a. With a neat flow chart, explain the production of ethanol from wood by acid hydrolysis. (12 Marks)  
b. The following data are given for a family biogas digester suitable for the output of five cows. The retention time is 20 days, temperature is 30°C, dry matter consumed per day = 2 kg, biogas yield is 0.24 m<sup>3</sup> per kg. The efficiency of burner is 60%, methane proportion is 0.8. Heat of combustion of methane = 28 MJ/m<sup>3</sup>.  
Calculate i) The volume of biogas digester  
ii) The power available from the digester. (08 Marks)
- 7 a. Explain the method of conversion of bio-diesel from edible and non-edible oils. (10 Marks)  
b. Discuss the effect of use of bio-diesel in IC engines. (10 Marks)
- 8 Write short notes on the following :  
a. Brayton cycle  
b. Rankine cycle  
c. Photosynthesis  
d. Digester design considerations. (20 Marks)

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