VIII ME

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Eighth Semester B.E. Degree Examination, June 2012

Industrial Management

Time: 3 hrs.   Max. Marks:100

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

<div style="writing-mode: vertical">
Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.
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PART – A

1 a. Explain the contributions made by the following towards the development of modern management:
   i)   Frank B Gilbreth
   ii) Henry Fayol   **(10 Marks)**
   b. Discuss the different types of ownerships. Distinguish between public limited and private limited companies.   **(10 Marks)**

2 a. Explain the major statistical methods and tools used for quality control and improvement.   **(06 Marks)**
   b. Define 'total quality management' and explain briefly the basic principles of TQM.   **(08 Marks)**
   c. Discuss the different types of quality costs.   **(06 Marks)**

3 a. Differentiate between chance causes and assignable causes of variations with an example.   **(08 Marks)**
   b. Discuss the significance of control charts.   **(06 Marks)**
   c. Differentiate between control chart for variables and attributes.   **(06 Marks)**

4 a. Explain the standard procedure of work study.   **(06 Marks)**
   b. List the principles of motion economy as applied to the arrangement of workplace. **(08 Marks)**
   c. Define 'wage incentive'. What are the objectives of incentive schemes?   **(06 Marks)**

PART – B

5 a. What is motivation? Compare Mc Gregor's theory X and theory Y.   **(10 Marks)**
   b. Write short notes on:
   i) Maslow's hierarchy of needs
   ii) Findings of Hawthrone experiments.   **(10 Marks)**

6 a. Explain the contributions of Elton Mayo and Skinner to behavioral sciences.   **(12 Marks)**
   b. Briefly explain the importance of predicting, directing and controlling the behaviour of employees in an organization.   **(08 Marks)**

7 a. Discuss the four major decisions for effective processes.   **(06 Marks)**
   b. Explain the pros and cons of customer involvement.   **(06 Marks)**
   c. Explain 'process reengineering' strategy for effective design of the process.   **(08 Marks)**

8 a. Discuss the role of technology management in improving the business performance in the present context.   **(14 Marks)**
   b. Explain the importance of technology fusion.   **(06 Marks)**

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Eighth Semester B.E. Degree Examination, June 2012

Hydraulics and Pneumatics

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Define Pascal law and state one application. **(04 Marks)**
   b. A displacement type cylinder has a rod of 65 mm diameter and is powered by hand pump with a displacement volume of 5 ml per double stroke. The maximum operating pressure is 350 bar. Calculate :
   i) The number of double pumping strokes needed to extend the cylinder rod by 50 mm
   ii) The maximum load which could be raised, using the system. **(08 Marks)**
   c. With a neat sketch, explain the construction and working of a external gear pump. **(08 Marks)**

2 a. Derive an expression for volumetric displacement of inline-axial piston pump. **(08 Marks)**
   b. A hydraulic motor has a displacement of 130 cm^3, operates with a pressure of 105 bar and has a speed of 2000 rpm. If the actual flow rate consumed by the motor is 0.005 m^3/sec and the actual torque delivered by motor is 200 Nm. Find:
   i)   Volumetric efficiency
   ii) Mechanical efficiency
   iii) Overall efficiency
   iv) Power delivered by motor in kW. **(12 Marks)**

3 a. Explain the control of double acting cylinder using 4/2 DCV. **(04 Marks)**
   b. Describe regenerative circuit and its application. **(08 Marks)**
   c. A double acting cylinder is hooked to an regenerative circuit. The relief valve setting is 105 bars. The piston area is 130 cm^2 and the rod area is 45 cm^2. If the pump flow is 0.0016 m^3/sec, determine the cylinder speed and load carrying capacity for:
   i)   Extension stroke
   ii) Retracting stroke
   iii) Power consumed during extension and retraction **(08 Marks)**

4 a. Describe the meter-in circuit used for controlling the speed of cylinder. List the merits and demerits. **(10 Marks)**
   b. Design a hydraulic sequencing circuit used in a drilling machine for clamping work piece and drilling a hole by using logic gates. **(10 Marks)**

PART – B

5 a. List six desirable properties of hydraulic fluid and explain any two properties. **(06 Marks)**
   b. With a neat sketch, explain full flow filter. **(08 Marks)**
   c. Discuss sealing devices. **(06 Marks)**

6 a. Explain the following:
   i) Magnetic type rodless cylinder
   ii) Cable operated rodless cylinder **(08 Marks)**
   b. Describe torque cylinder. **(08 Marks)**
   c. Write the graphical symbol of normally open 3/2 pneumatic direction control valve.
   (04 Marks)

7 a. Write down ISO-5599-3 coding for the following pressure port, working ports and exhaust ports. **(04 Marks)**
   b. With a neat sketch, explain the control of extension of a double acting cylinder using OR and AND logic functions. **(10 Marks)**
   c. Describe the diaphragm type accumulator. **(06 Marks)**

8 a. What is signal overlap? Describe signal overlap in a memory device and its suppression.
   (10 Marks)
   b. Explain gas loaded accumulator. **(05 Marks)**
   c. Write a brief note on chemical dryers. **(05 Marks)**

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Eighth Semester B.E. Degree Examination, June 2012
Tribology

Time: 3 hrs.   Max. Marks:100

Note: *1. Answer FIVE full questions, selecting atleast*
TWO questions from each part.
2. Use of machine design data hand book is permitted.

PART – A

1   a.   Define the following :
          i)   Viscosity
          ii)   Fluidity
          iii)   Newtonian fluid
          iv)   Viscosity index.   **(04 Marks)**
   b.   Explain briefly the factors affecting viscosity.   **(06 Marks)**
   c.   Explain with neat sketches the following viscosity measuring apparatus :
          i)   MAC – MICHEL viscometer
          ii)   Flowers viscometer.   **(10 Marks)**

2   a.   A lightly loaded journal bearing has the following specifications :
      Journal diameter = 100 mm; Bearing length = 80 mm; radial clearance = 0.05 mm; radial
      load = 1000 N; absolute viscosity of oil = 0.015 pas – sec.
      Using Petroff's equation, determine :
      i)   Speed of journal which corresponds to a co-efficient of friction of 0.4.
      ii)   Power loss at this speed.   **(10 Marks)**
   b.   An idealized full journal bearing has the following data :
      Diameter of journal = 50 mm; bearing length = 65 mm; speed = 1200 rpm; radial
      clearance = 0.025 mm; average viscosity = 0.001125 pas-sec; attitude = 0.8.
      Calculate :
      i)   Load carrying capacity
      ii)   Co-efficient of friction
      iii)   Power loss in bearing.   **(10 Marks)**

3   a.   List the assumptions made in the derivation of Reynolds equation in two dimension.
                                                           (06 Marks)
   b.   A 120° centrally loaded bearing has the following specifications :
      Diameter of journal = 100 mm; length of bearing = 130 mm; diameter clearance = 0.15 mm;
      oil used SAE 60; minimum film thickness = 0.0045 mm; speed of journal = 600 rpm;
      bearing operating temperature = 95°C ; considering end leakage determine :
      i)   Load carrying capacity
      ii)   Power loss in the bearing
      iii)   Expected maximum pressure in the bearing.   **(14 Marks)**

4   Derive an expression for pressure distribution for a plane slider bearing with a fixed shoe.
                                                         (20 Marks)

PART – B

5   A journal bearing operating under steady state condition has the following specifications. Diameter = 100 mm, length = 105 mm, speed = 1600 rpm, radial clearance = 0.075 mm, load = 27.3 kN, expected mean oil film temperature = 99°C, minimum film thickness must not be less than 0.015 mm. The bearing is lubricated under pressure with inlet oil temperature of 44°C. Determine :
   i)   Required viscosity of lubricating oil and kind of oil which should be used
   ii) Power loss
   iii) Inlet pressure required for cooling the bearing
   iv) Corresponding rate of flow.   (20 Marks)

6   a.   Derive an expression for load carrying capacity of a hydrostatic step bearing.   (10 Marks)
     b.   A hydrostatic step bearing for a turbine rotor has the following specification :
          Diameter of shaft = 150 mm; diameter of pocket = 100 mm; vertical thrust = 70 kN; shaft speed = 1000 rpm; viscosity = 0.025 pa. sec; oil film thickness = 0.125 mm.
          Determine :
          i)   Rate of oil flow through the bearing
          ii) Power loss due to viscous friction
          iii) Co-efficient of friction.   (10 Marks)

7   a.   List any ten properties desirable for a typical bearing material.   (10 Marks)
     b.   Define wear. Discuss the different types of wear.   (10 Marks)

8   a.   Briefly discus behaviour of tribological components.   (10 Marks)
     b.   Briefly explain the improved design and surface engineering.   (10 Marks)

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Eighth Semester B.E. Degree Examination, June 2012
Foundry Technology

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Explain gas absorption in Al-alloys. **(05 Marks)**
   b. Explain factors affecting fluidity. **(05 Marks)**
   c. Explain phenomenon of the shrinkage of liquid metals referring to cooling curves and how it affects casting yield. **(05 Marks)**
   d. Explain the spiral fluidity test with the figure. **(05 Marks)**

2 a. Write a note on the directional solidification with the figure. **(05 Marks)**
   b. How do you design a pattern for low cost? **(05 Marks)**
   c. Showing the casting structures, discuss about them. **(10 Marks)**

3 a. Distinguish between homogeneous and heterogeneous nucleation. Explain the solidification of an alloy is different from a pure metal. **(10 Marks)**
   b. Discuss the practical measures for size control and modification of grains. **(10 Marks)**

4 a. The problem of providing the feed metal necessary to compensate for shrinkage, during solidification period of casting involves quite a few variables. List these variables. **(05 Marks)**
   b. "Practicalities dictate the use of cylinders for most risers". Defend the statement. **(05 Marks)**
   c. Draw the figure of riser gated casting with side riser and top riser and label it. **(05 Marks)**
   d. Draw the figure of an atmosphere or pressure riser. Explain its advantage over the blind riser. **(05 Marks)**

PART – B

5 a. Draw the sketch of the cupola. Explain different zones with reactions. **(10 Marks)**
   b. Draw the figure of a coke less cupola and explain the process. **(10 Marks)**

6 a. Compute the probable analysis of the charging mixture so that the cast metal will have the following composition:

Total carbon	3.3 to 3.5%
Silicon	1.9 to 2.1%
Manganese	0.5 to 0.65%
Phosphorus	0.5 to 0.55%
Sulphur	0.06% maximum

   The raw materials available are:

Materials	C%	Si%	Mn%	S%	P%
Pigiron No.1	3.5	2.5	0.4	0.02	0.6
Pigiron No.2	3.2	1.5	1.0	0.01	0.4
Foundry returns	3.2	1.2	0.6	0.009	0.5
Purchased scrap	3.5	1.8	0.5	0.10	0.4
Ferro silicon		50.0			

   The charge consists of: i) Pigiron No.1 = 30%,   ii) Pigiron No.2 = 20%,
   iii) Foundry returns = 40%,   iv) Purchased scrap = 10%.
   The loss or gains of various elements is as follows:
   C = no gain/loss,   Si = loss 10%,   Mn = loss 15%,
   Sulphur = pickup 0.03%,   Phosphorus = no loss/gain. **(10 Marks)**

6 b. Explain different types of cast iron with composition, microstructure, fracture they present and specific properties. **(10 Marks)**

7 a. List the furnaces used to produce steel and draw the figure of any one of them. **(04 Marks)**
   b. Explain the production of Malleable iron showing malleabizing treatment diagram. **(06 Marks)**
   c. Write the casting characteristics of Al-alloy. **(04 Marks)**
   d. Discuss fluxing and flushing of Al-molten metal. **(06 Marks)**

8 a. Explain drossing referring to the melting of copper alloys. **(05 Marks)**
   b. Write the applications of copper and its alloys. **(05 Marks)**
   c. With a flow chart, explain the process of sand circulation in a mechanized foundry. **(10 Marks)**

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Eighth Semester B.E. Degree Examination, June 2012
Industrial Engineering and Ergonomics

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a.   Differentiate between production and productivity.   (04 Marks)
    b.   What are the factors affecting productivity?   (10 Marks)
    c.   Explain the benefits and uses of work study.   (06 Marks)

2   a.   Draw the outline process chart of repair of a car tube puncture.   (10 Marks)
    b.   Explain the principles of motion economy.   (10 Marks)

3   a.   Explain the procedure for work sampling.   (08 Marks)
    b.   Explain the advantages, limitations and uses of work sampling.   (08 Marks)
    c.   What are the objectives and techniques of work measurement?   (04 Marks)

4   a.   What are the steps involved in time study?   (10 Marks)
    b.   Define the following terms:
         i)   Process allowance.
         ii)   Relaxation allowance.
         iii)   Observed time.
         iv)   Elemental time.
         v)   Performance rating factor.   (10 Marks)

PART – B

5   a.   Explain the elements of design considering stone are as an example.   (10 Marks)
    b.   Distinguish between industrial designer and engineering designer.   (04 Marks)
    c.   Sketch the scope of industrial design in designing the majority of engineering products.
                                                                                               (06 Marks)

6   a.   What is "figure on ground effect"? Distinguish between acquity and accommodation.
                                                                                               (08 Marks)
    b.   Explain Gestalts interpretation of secking wholeness.   (04 Marks)
    c.   Explain the mechanics of seeing with a neat sketch of human eye.   (08 Marks)

7   a.   Explain the terms Hue, chroma and valve using Munsell colour notation.   (10 Marks)
    b.   What is colour constancy? Explain different forms of colour circles.   (10 Marks)

8   a.   Explain the concept of unity and the concept of order with variety.   (10 Marks)
    b.   Explain the following aesthetic expressions:
         i) Symmetry; ii) Balance; iii) Contrast; iv) Continuity; v) Proportion.   (10 Marks)

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Eighth Semester B.E. Degree Examination, June 2012
Automotive Engineering

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. List the components of automotive engine. Mention their functions and materials used for manufacturing.   **(05 Marks)**
    b. What is piston slap? Explain various techniques used to avoid piston slap.   **(08 Marks)**
    c. Classify valve operating mechanisms. Sketch over head inlet and side exhaust valve mechanism.   **(07 Marks)**

2   a. With neat sketch, explain fuel-mixture requirements for SI engines.   **(10 Marks)**
    b. Sketch and explain various circuits of solex carburetor.   **(10 Marks)**

3   a. What is supercharging? Compare supercharged engines with naturally aspirated engines.
                                                                                (05 Marks)
    b. Explain different methods of supercharging.   **(08 Marks)**
    c. Sketch and explain turbocharging.   **(07 Marks)**

4   a. List the requirements of ignition system.   **(05 Marks)**
    b. Explain working of electronic ignition system with help of a sketch.   **(08 Marks)**
    c. Compare battery and magneto ignition systems.   **(07 Marks)**

PART – B

5   a. Classify clutches. With a neat sketch, explain working of multiplate clutch.   **(06 Marks)**
    b. Explain necessity for gear ratios in transmission.   **(06 Marks)**
    c. Explain working principle of automotive transmission.   **(08 Marks)**

6   a. Sketch and explain three types of fixing the wheels to rear axle.   **(10 Marks)**
    b. Explain the functioning of differential.   **(05 Marks)**
    c. With a neat sketch, explain the effects of over steer, under steer and neutral steer.   **(05 Marks)**

7   a. Describe the working of wishbone type of independent suspension system with a neat sketch.   **(06 Marks)**
    b. Explain working of master cylinder with a neat sketch.   **(09 Marks)**
    c. Sketch and explain working of vacuum servo brake.   **(05 Marks)**

8   Write short notes on :
    a. Various methods of reduction of formation of pollutants.
    b. Closed crank case ventilation.
    c. Exhaust gas recirculation systems.
    d. Catalytic converter.   **(20 Marks)**

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