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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 $\overline{X}$ 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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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 $90cm^3$. 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 cm^3 per devolution 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 accumulater – sate 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)**

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 rotory actuator? Name is 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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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-Poisuelle 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 = 1.6×10^{-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)**

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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06ME838

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

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions each from Part – A and Part - B.***

PART – A

1 a. What is degassing? Explain the different methods used for degassing of liquid metal during casting process. **(10 Marks)**

b. What is fluidity? How to measure fluidity? Explain measurement of fluidity with simple sketches. **(10 Marks)**

2 a. Discuss the property criteria in design of casting. **(10 Marks)**

b. Explain the following : i) Design of minimum casting stresses ii) Design for low pattern cost. **(10 Marks)**

3 a. Explain the following : i) Grain structure of cast metal ii) Grain shape and orientation iii) Dendritic growth. **(12 Marks)**

b. With an illustration, explain the concept of progressive and directional solidification process. **(08 Marks)**

4 a. Define riser. With an illustration differentiate between open and blind riser. **(06 Marks)**

b. Explain the role of internal and external chill pads for directional solidification. **(06 Marks)**

c. Explain theoretical approach for getting system inflow of fluid during casting. **(08 Marks)**

PART – B

5 a. With an illustration, explain vacuum moulding process. **(08 Marks)**

b. With an illustration, explain the operation of CUPOLA. **(12 Marks)**

6 a. Explain casting characteristics and specifications of steel. **(10 Marks)**

b. Explain the casting characteristics of malleable iron and its applications. **(10 Marks)**

7 a. Explain melting procedure and casting characteristics of aluminium alloy. **(10 Marks)**

b. Explain with applications of magnesium alloy casting process. **(10 Marks)**

8 a. Explain how mechanization can be done in moulding sand preparation. **(08 Marks)**

b. Write a note on equipment handling in melting of metal. **(06 Marks)**

c. Explain the need for modernization of foundry. **(06 Marks)**

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06ME842

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

Industrial Engineering and Ergonomics

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Define productivity. What are the factors affecting productivity? Explain briefly. **(10 Marks)**

b. Explain briefly, the principles of motion economy. **(10 Marks)**

2 a. Explain briefly the flow process chart symbols. **(10 Marks)**

b. Define SIMO chart. Explain briefly its construction and operation. **(10 Marks)**

3 a. Define work management. What are the objectives of work management? **(10 Marks)**

b. What are the work measurement techniques? Explain briefly. **(10 Marks)**

4 a. What is time study? List the advantages, limitations and application of time study. **(10 Marks)**

b. In a firm the observed time is recorded to be 20 minutes for a job done by a worker whose rating is 100. Following allowances are recommended by the management:

i) Personal needs allowance = 6% of basic time
ii) Basic fatigue time allowance = 3% of basic time
iii) Contingency work allowance = 2% of basic time
iv) Contingency delay allowance = 3% of basic time

Determine basic time, work content and standard time for the job. **(10 Marks)**

PART – B

5 a. Define ergonomics. Explain systems approach to ergonomic models. **(10 Marks)**

b. Discuss the importance of Anthropometric. Design principles related to work station. **(10 Marks)**

6 a. How do you measure mental work load? **(10 Marks)**

b. Explain briefly the human factors in an information revolution. **(10 Marks)**

7 a. What are the factors affecting visual activity and contrast sensitivity? **(10 Marks)**

b. Explain briefly the colour coding of controls. **(10 Marks)**

8 a. What are Anthropometric design principles? Explain briefly. **(10 Marks)**

b. Explain briefly the components of house style or work surface design. **(10 Marks)**

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06ME844

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

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions each from Part – A and Part - B.***

PART - A

1 a. List the components of automotive engine. Mention their functions and materials used for manufacturing. **(06 Marks)**

b. Explain the factors which influence the combustion chamber design in SI and CI engines. **(08 Marks)**

c. What is the necessity of cooling the valve? Explain sodium cooled valve. **(06 Marks)**

2 a. Discuss the mixture requirements for steady state operation of an SI engine. **(06 Marks)**

b. With a neat sketch, explain the different circuits of a carter carburetor. **(08 Marks)**

c. Explain the working of a fuel injection pump, with a neat sketch. **(06 Marks)**

3 a. Distinguish between Supercharging and Turbocharging. **(06 Marks)**

b. Explain different methods of Supercharging. **(08 Marks)**

c. Define Turbocharger lag. Mention the limitations of Turbocharging. **(06 Marks)**

4 a. Explain the working of : i) Rotating armature type and ii) Rotating magneto ignition system. **(10 Marks)**

b. What is ignition advance? With sketch, explain the working of centrifugal advance. **(10 Marks)**

PART - B

5 a. What are the requirements of a clutch? **(04 Marks)**

b. With a neat sketch, explain four speed synchromesh transmissions. **(06 Marks)**

c. What is the principle of automatic transmission? **(03 Marks)**

d. A clutch plate is developing 30kW at 3000 rpm. The inner diameter of the clutch plate is 0.6 times of its outer diameter and it is to be ensured that there should not be a slip even after 30% of loss of engine torque due to clutch facing wear. The pressure intensity should not exceed 70kPa. Taking $\mu = 0.3$, determine the dimensions of the clutch plate. **(07 Marks)**

6 a. Show the different types of connections between axle shaft and wheel. Briefly explain them. **(10 Marks)**

b. What is over steering and under steering? What are the effects of over and under steer? **(05 Marks)**

c. Explain the working of power steering. **(05 Marks)**

7 a. Explain with neat sketch i) Leaf springs ii) Coil springs. **(08 Marks)**

b. Briefly explain the weight transfer phenomena showing various forces acting when brakes are applied to a moving vehicle. **(06 Marks)**

c. Explain the purpose and operation of antilock braking system. **(06 Marks)**

8 a. Briefly explain different types of emission from IC engines. **(06 Marks)**

b. What are catalytic converters? How they are helpful in reducing HC, CO and NO_x emissions. **(08 Marks)**

c. Explain the different emission standards. **(06 Marks)**

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