UNIVERSITY OF PUNE

[3661]-102
B. E. (Production Sandwich Engineering)
Examination - 2013
Automobile Engineering
(2008 Pattern)

Total No. of Questions : 12   [Total No. of Printed Pages :3]

[Time : 3 Hours]   [Max. Marks : 100]

SECTION-I
UNIT I

Q1.
   a) Describe the working of two stroke diesel engine with neat diagram.   [8]
   b) List various types of frame and describe in brief the conventional frame. [8]
   c) What do you understand by frameless frame?   [2]

OR

Q2.

   a) What are the functions of frame?   [8]
   b) How do you classify internal combustion (IC) engines? Explain.   [8]
   c) What do you mean by super charging?   [2]

UNIT II

Q3.

   a) What is the function of the thermostat in the cooling system? Explain typical thermostat.   [10]
   b) What are the effects of overheating of engine parts?   [6]

OR

Q4.

   a) Give advantages and disadvantages of Air cooled system?   [8]
   b) What are open and close cooling systems?   [8]

UNIT III

Q5.

a) Explain Magneto ignition system. [8]
b) What is friction? Why it occurs? What are its effects? [8]

OR

Q6.

a) What are oil additives and what its functions? [8]
b) What are the different types of lubricant? [8]

SECTION II
UNIT IV

Q7.

a) What is the purpose of pressure plate in the clutch? [8]
b) With the help of neat sketch, explain the construction and operation of sliding mesh gear box. [10]

OR

Q8.

a) Explain the components of clutch. [12]
b) How a multi-plate clutch is able to transmit more power in comparison to a single plate clutch. [6]

UNIT V

Q9.

a) Sketch and explain Ackermann steering mechanism? [8]
b) Write short note on shock absorber and Torsional bar. [8]

OR

Q10.

a) Explain different types of springs? [8]
b) What are the various components of steering system? [8]

UNIT VI

Q11.

a) Explain different types of braking systems used in automobile? [10]
b) Write the functions of brakes in an automobile. [6]

OR

Q12.

a) What is mean by servicing? And explain different types of servicing   [8]

b) Write short note on Vacuum Brakes?   [8]

Total No. of Questions : 12   **[Total No. of Printed Pages :3]**

[4364]-506

B. E. (Production) (Semester - II)
Examination - 2013
Computer Integrated
Manufacturing and
Industrial Robotics.
(2008 Course)

[Time : 3 Hours]   **[Max. Marks : 100]**

Instructions :

    *(1) Answer **three** questions from section I and **three** questions from section II.*

    *(2) Answers to the **two sections** should be written in **separate answer-books**.*

    (3) Figures to the right indicate full marks.

    (4) Use of calculator is allowed.

    (5) Answer one question from 1 & 2, 3 & 4, 5 & 6,7 & 8, 9 & 10, 11 & 12.

SECTION-I

Q-1) A) List out the different models used in CIM? Draw the neat sketch IBM Models and compare with various Models? (12)

    B) Explain need of Models in CIM (4)

OR

Q-2) A) Define Rapid prototyping. Explain different methods of Rapid prototyping method in detail. (8)

    B) Explain the following in detail. (8)

    1) Solid ground Curing.

    2) Application Rapid tooling methods to forging process.

Q-3) A) Explain the basic elements of Robotics (8)

B) Derive the equation of Kinematics using homogeneous Transformation. (8)

Q-4) A) Explain the Principle of Dennavati-Hartenberg s convention for dynamics Analysis of Joints along with suitable example. (12)

B) Write a short note on Concept of Spatial Mechanism. (4)

Q-5) A) Explain role pneumatic drives in Robotics. (6)

B) Using a schematics diagram represent a hydraulic circuit to explain the Drives system of bang-bang robot having waist motion. Shoulder and arm expansion respectively. (12)

OR

Q-6) A) Explain different types of Actuators used in typical Robot along with sketch. (10)

B) Explain Power Transmission system in Robotics. (2)

C) Explain the concept of basics motion conversion System. (4)

SECTION-II

Q-7) A) Classify the various types Grippers used in Robotics. (8)

B) A 10 kg rectangular block is gripped in the middle and lifted vertically At velocity 2m/s. If it accelerates to this velocity at $35m/s^2$ and the Coefficient of friction between the gripping pad and block is 0.5 Calculate minimum force that would prevent slippage. (8)

OR

Q-8) A) Explain concept finite element analysis in grippers design for pressure Foragile. and mechanical Gripper (8)

B) Write a short note on design consideration for gripper design. (8)

Q-9) A) What are the different types of sensors used in robotics? Classify (8)

B) Distinguish between tactile sensors and proximity sensors? (4)

C) What do you mean by range sensors and proximity sensors? (4)

OR

Q-10) A) What is robot vision? What are the types of vision sensors used to take the Image of an object? (8)

B) Explain Important technique use in robot Vision System (8)

1) Thresholding 2) Region growing 3) Edge detection 4) Template matching

Q-11) A) Explain along with sketch the application Robot in the following Area

1) Material handling 2) Spray Painstaking 3) Assembly of Television. (12)

B) Explain the application of CLIMBING Robot in detail. (6)

OR

Q-12) Write short note on following. (18)

1) Dynamic Properties of Robot.

2) Modolular Design Concept in Robotics.

3) Languages used for programming in robot.

UNIVERSITY OF PUNE
[4364]-502
B. E.(PRODUCTION) S/W Examination - 2013
MECHATRONICS AND ROBOTICS(402045)
(2008 Course)

[Total No. of Questions : 12]   [Total No. of Printed Pages :3]
[Time : 3 Hours]   [Max. Marks : 100]
Instructions :

> *(1) Answer **any three** questions from each section1 and any three Question from section 2.*
> *(2) Answers to the **two sections** should be written in **separate answer-books**.*
> *(3) Use of calculator is allowed .*
> *(4) figures to the right indicate full marks.*
> *(5) Answer one question from 1&2,3&4,5&6,7&8,9&10,11&12.*

SECTION-I

Q. 1. A) Describe a fully automatic washing machine giving information   (12)
of Basic Elements of Control system used with neat figure or Block
Diagram.

B) Explain along example open loop system.   (6)

OR

Q. 2. Explain the following along with example. (Any 3)   (18)
1) First Order System.
2) Single Conditioning.
3) ADC AND DAC.
4) Types of operational Amplifier.

Q. 3. A) Draw the architecture of 8085 microprocessor   (6)
B) Explain Basic Structure of Microcontroller along with neat sketch.   (6)
C) Write a short note on flag registrar used in 8085 microprocessor   (4)

OR

Q. 4. A) Explain in detail CMOS and Digital Logics along with example.   (8)
B) Write down simple program for 8085 to clear Memory.   (8)

Q. 5. A) What do you understand by Assembly Language? Define   (8)
Mnemonics with Example.

    B) Write down the programme for subtractions of two-bit number also   (8)
draw the flow Chart.

<center>OR</center>

Q. 6. Explain the Following along with Example   (16)
       1) Need of Interfacing
       2) Bidirectional Buffer
       3) Polling and interrupts
       4) Hand Shaking.

<center>**SECTION-II**</center>

Q. 7. A) Explain different types of sensors used in a Luxury Car.   (8)

    B) Explain along with Example Basic Structure of PLC.   (8)

<center>OR</center>

Q. 8. A) Draw the PLC logic diagram to control a process which is desired   (16)
to start Turning on the motor in 10 second after the part touches the limit
switch. The Process is terminated automatically when the finish part
touches the second Limit switch. An emergency switch will stop the
process on time when it is Pressed.

Q. 9. A) Explain along with example electrical actuators used in Automation   (8)
    B) Explain the following   (8)
     1) Rotary Encoder
     2) Relays
     3) MOSFETs
     4) Pneumatic Actuators

Q. 10. A) Explain the following   (16)
       1) 4/2-Seat type direction control Valves.
       2) Electro hydraulic servo valves.
       3) Hydraulic Power supply.
       4) Meter IN and Meter out Circuit.

Q. 11. A) Compare the work envelope of typical robot arm with Human arm.   (6)

B) How to tackle obstacle in the path of robot arm? Explain with   (8)
example the Sensors used in this connection.

C) Define 1) Repeatability   2) Resolution   3) Accuracy   4) Orientation   (4)
of Error

OR

Q. 12. A) Explain Modular Design concept in robotics.   (6)

B) Write a short note on following   (12)
   1) Types grippers used in robotics.
   2) Dynamics properties of Robot.
   3) Application of robot.

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B. E. Examination - 2013
Product Development
(2008 Course)

Total No. of Questions : 12   [Total No. of Printed Pages :3]
[Time : 3 Hours]   [Max. Marks : 100]
Instructions :

*(1) Answer Q.1 or Q. 2, Q.3 or Q.4, Q.5 or Q.6, from section-I
and Q.7 or Q.8,Q9 or Q.10, Q.11 or Q.12 from section-II.*
(3) Black figures to the right indicate full marks.
(4) Neat diagrams must be drawn wherever necessary.
*(5) Use of logarithmic tables, slide rule, Molliercharts,
electronic pocket calculator and steam tables is
allowed.*
(6) Assume suitable data, if necessary.

SECTION-I

UNIT 1

Q. 1. A) Explain product Verification & validation in short with example.   (8)

B) What is modern product development process? Explain role of   (10)

Product development team in product development planning with

Reference to ISO standard.

OR

Q. 2. A) What do you mean by product design? Explain in brief different   (6)

Factors in products design?

B) Write short notes on: (12)

1. Concurrent design
2. Quality function deployment
3. Rapid prototyping

UNIT 2

Q. 3. A) What is mission statement and Technical Questioning? Explain the   (8)

Economic Analysis of product.

B) What are the types of customer needs? What do you mean by   (8)
Customer satisfaction and explain effect of customer satisfaction on
Product design?

<div align="center">OR</div>

Q. 4. A) What is Technology Forecasting? Explain in detail Technology S-   (8)
Curve.

B) Write short notes on: (8)
1) Market Segmentation 2) Customer Needs

<div align="center">UNIT 3</div>

Q. 5. A) What is functional modeling? Explain decomposition in detail?   (8)
B) Explain the different steps of products development based on   (8)
Product function?

<div align="center">OR</div>

Q. 6. A) Describe Pugh's Concept in detail with example?   (8)
B) Write in short notes: (8)
i) Concept Selection Process ii) System Modeling

<div align="center">SECTION-II</div>
<div align="center">UNIT 4</div>

Q. 7. A) What is product tear down process & explain its different methods?   (8)
B) What is indented assembly cost analysis & explain function from   (8)
Diagrams.

<div align="center">OR</div>

Q. 8. A) What is reverse engineering? Explain the advantages & disadvantages (8)

<div align="center">2</div>

Of reverse engineering.

B) What is product portfolio & architecture explain with suitable   (8)

example.

<div align="center">UNIT 5</div>

Q. 9.   Explain the following terms: (16)

1. Design for manufacture
2. Virtual Trials
3. Product Testing
4. Fields trials

<div align="center">OR</div>

Q. 10. A) Explain the global need & importance of design for environment.   (8)

B) Explain the guidelines to be followed in the design of the parts for   (8)

The following processes.

i)   Forging
ii)   Welding

<div align="center">UNIT 6</div>

Q. 11. A) What is product life cycle? Explain its needs & benefits?   (8)

B) Explain in short reliability concept in product development.   (10)

<div align="center">OR</div>

Q. 12.   Write short notes following   (18)

i) Customer involvement   ii) Technologies in product life cycle

iii) Importance of customer involvement.

UNIVERSITY OF PUNE

[4364]-513

B.E Production S/W Engineering

411085: PLANT ENGINEERING AND MAINTENANCE (ELECTIVE II - IV)

[Time: *3* Hours]   [Max. Marks: 100]

Instructions :
a.   Answer **any 3** questions from **each** Section.
b.   Answer **3** questions from Section **I** and **3** questions from Section II.
c.   Answers to the **two** Sections should be written in **separate** books.
d.   **Neat** diagrams must be drawn **wherever** necessary.
e.   Assume suitable data, if **necessary**.

SECTION – I

1)

   i) a) Explain Principles of Plant management functions.   8
   ii) b) What is productivity measurement? Explain any one problem solving
       technique.   8

                                        OR

   iii) Differentiates between predictive and preventive maintenance.   8
   iv) Write a note on :   8
       1) Parato chart
       2) Assessment of maintenance work

2)

   i)   With the help of neat example explain REL chart.   8
   ii) Write Muther's plant layout procedure.   8
                                        OR
   iii) List basic plant layout facilities.   8
   iv) With the help of neat diagram explain different types of layouts   8

3) Write a note on (any 3)   18

   i)   PQRST analysis
   ii) Group technology

iii) Space diagram
iv) Need of training of maintenance and safety
v) Material handling in process layout

SECTION – II

4)
i) Write a note on MICLASS.   8
ii) What is inventory management?   8

OR

iii) With the help of neat example explain condition based maintenance   8
iv) What is usage monitoring? Explain its advantages.   8

5)
i) Explain life cycle costing.   8
ii) Explain effect of life cycle costing on maintenance   8

OR

i) What is reliability? Explain relationship with maintenance   8
ii) Explain any one rigorous model of life cycle costing   8

6) Write a note on (any 3)   18

i) Pollution control
ii) Recycling of waste
iii) Maintenance Audit
iv) Material handling and plant layout

[Total No. of Questions:6] [Total No. of Printed Pages: 2]
UNIVERSITY OF PUNE
[4364]-515
B. E. (Production S/W) Examination - 2013
Marketing Management (2008 Course)

[Time: *3* Hours] [Max. Marks: 100]

Instruction

1 *Answer any three questions from Section I and any three questions from Section II*
2 *Neat diagrams must be drawn wherever necessary.*
3 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
4 *Assumptions made should be clearly stated and justified.*

Section - I

Q.1) Explain different marketing philosophy of business with suitable example [16]

OR

Q.1) Explain industrial marketing perspective for innovative products [16]

Q.2) Explain different marketing management tools for understanding consumer's decision processes [16]

OR

Q.2) What are different perspectives of organizational buyers in industrial markets? Explain with suitable example. [16]

Q.3) a) "For industrial marketing gathering marketing information is critical" Justify [08]

b) Explain how will you position products in defined market segments [10]

OR

Q.3) Write a short note on following [18]

a) Formulating marketing strategies

b) **Planning marketing programs**

c) **Managing Products**

Section – II

Q.4) Explain marketing intermediaries and marketing logistics in detail

[16]

OR

Q.4)a) For industrial marketing which price theory will you adopt? Justify

[08]

b) **Explain designing and managing product promotions**

[08]

Q.5) Explain managing sales force and sales territories with suitable example

[16]

OR

Q.5) Write a note on :

[16]

i) **Marketing and Technological Innovations**

ii) **Non-Profit and Social Marketing**

Q.6) Explain marketing research and its importance for industrial marketing? If you are manufacturer of CNC machine tools, how will you arrange its marketing structure? [18]

OR

Q.6) Write a short note on following

[18]

i) **Role of quantitative techniques in marketing research**

ii) **Tools in marketing research**

Total No. of Questions : 12   [Total No. of Printed Pages :10]
[Time : 3 Hours]   [Max. Marks : 100]

Instructions :

    (1) Answer 3 question from each Question

    *(2) Answers to the **two sections** should be written in **separate answer-books***

    (3) Number to the right indicate full marks.

    (4) Neat diagrams must be drawn wherever necessary.

    (5) Use of Non-programmable electronics calculator is allowed

    (6) Assume suitable data, if necessary.

SECTION-I

Q.1. a) Maximize $Z = 12x_1 + 15x_2 + 14x_3$ (8)

Subject to the constrains $- x_1 + x_2 \leq 0$

$$- x_2 + 2x_3 \leq 0$$

$$x_1 + x_2 + x_3 \leq 100$$

x_1 unrestricted; $x_2, x_3 \geq 0$

b) Solve using , two phase simplex method   (10)

Maximize $Z = 5x_i + 8x_2$

Subject to the constrain $3x_1 + 2x_2 \geq 3$

$$x_1 + 4x_2 \geq 4$$

$$x_1 + x_2 \leq 5$$

$$x_1 + x_2 \geq 0$$

Q.2. a) Minimize $Z = x_1 - 3x_2 + 2x_3$ (8)

Subject to the constraints $3x_1 - x_2 + 2x_3 \leq 7$

$$-2x_1 + 4x_2 \leq 12$$

$$-4x_1 + 3x_2 + 8x_3 \leq 10$$

$$x_1, x_2, x_3 \geq 0.$$

b) Solve using, Big M method (10)

Maximize $Z = 3x_1 - x_2$

Subject to the constraint $2x_1 + x_2 \geq 2$

$$x_1 + 3x_2 \leq 3$$

$$x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

Q.3. a) Solve the following transportation problem (8)

	X	Y	Z	AVAILABILTY
A	8	7	3	60
B	3	8	9	70
C	11	3	5	80
DEMAND	50	80	80	

b) Solve the travelling salesman problem with the following cost matrix (8)

Cities

		A	B	C	D
Cities	A	∞	46	16	40
	B	41	∞	50	40
	C	82	32	∞	60
	D	40	40	36	∞

OR

Q.4.a) Solve the following transportation problem by VAM (8)

	D_1	D_2	D_3	SUPPLY
A	2	7	4	5
B	3	3	1	8
C	5	4	7	7
D	1	6	2	14
DEMAND	77	9	18	

b) A company has 4 salesman A,B,C & D these salesman are to be allotted 4 districts 1,2,3 & 4 . The estimated profit per day for each salesman in each district is given in the following table.

	1	2	3	4
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

What is the optimal assignment which will yield maximum profit (8)

Q.5. a) A manufacturing company processes 6 different job in two machine A & B. Number of units of job and it's processing time on A & B are given in table. Find the optimal sequence, the total minimum elapsed time and idle time for each machine (8)

JOB NO	NO. OF UNITS OF EACH JOB	PROCESSING TIME	
		MACHINE A (minutes)	MACHINE B (minutes)
1	3	5	8
2	4	16	7
3	2	6	11
4	5	3	5
5	2	9	7.5
6	3	6	14

b) Compare demand rate uniform and production rate infinite with demand rate non uniform are production rate infinite of inventory models with deterministic demand. (8)

OR

Q.6. a) A machine operator has to perform three operations, turning, threading and knurling on a number of different job. The time to require to perform these operation (in minutes) for each job in known. Determine the order in which the job should be processed in order to minimize the total time required to turn out all the jobs. (8)

b) A particular item has a demand of 9000 units /year . The cost if one procurement is Rs.100 and the holding cost per unit is Rs. 2.40 per year. The replacement is instantaneous and no shortage are allowed. Determine

a) The economic lot size
b) The number of order per year
c) The time between orders
d) The total cost per year if the cost one unit is Rs.1 (8)

Q.7. a) On average 96 patient per 24 hour day require the services of an emergency clinic. Also on average, a patient requires 10 minutes of active attention. Assume that the facility can handle only one emergency at a time. Suppose that it costs the clinic Rs. 100 per patient treated to obtain an average servicing time of 10 min and that each minutes of decrease in this average time would cost Rs. 10 per patient traded. How much would have to be budgeted by the clinic to decrease the average size of the queue form $1\frac{1}{3}$ patients to $\frac{1}{2}$ patient ? (8)

b) Solve the following game

	B_1	B_2	B_3
A_1	1	7	2
A_2	0	2	7
A_3	5	1	6

OR

Q.8 a) Worker comes to tool store room to receive special tools (require by them) for accomplishing a particular project assigned to them. The average time between two arrivals is 60 second and the arrivals are assumed to be in Poisson distribution. The average services time (of the tool room attended) is 40 second. Determine

   a) Average queue length
   b) Average length of non empty queue
   c) Average number of worker in system including the worker being method
   d) Mean waiting time of an arrival
   e) Average waiting of an arrival (worker) who waits
   f) The type of policy is to be established. In words, determine whether to go in for an additional tool store room attended which will minimize the combined cost of attended idle time the cost of workers waiting time. Assume the charges of skilled worker Rs. 4 per hour and that of tool room attended Rs. 0.75 per hour. (8)

b. Solve the following game. (8)

	B₁	B₂	B₃	B₄
A₁	3	2	4	0
A₂	3	4	2	4
A₃	4	2	4	0
A₄	0	4	0	8

Q. 9.a) At a sales depot the arrival if customers and the service times follow the following probability distributions

Arrival time (minutes)	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
Probability	0.02	0.06	0.10	0.25	0.20	0.14	0.10	0.07	0.04	0.02

Services Time (minutes)	0.5		1		1.5		2		2.5		3
Probability	0.12		0.21		0.36		0.19		0.07		0.05

Estimate the average waiting time and percentage of idle time server , by simulation for 10 arrivals (8)

b) Machine A cost Rs. 45,000 and the running cost is Rs.1000 for the first year increasing by Rs 10000 per year afterwards. Another machine B cost Rs 50,000 and operating cost Rs..2000 for the first year increasing by Rs. 4000 per year subsequently. If we have machine A now, should we replace it with B? If so find the best time for replacement (8)

OR

Q.10.a) A tourist car company find that during the past 200 day the demand for the car has the following frequently distribution

Service Time (Minutes)	0	1	2	3	4	5
Probability	16	24	30	60	40	30

Using random number simulation the demand for the period of 10 weeks.   (8)

b) The probability distribution of the failure time for the certain type of electric bulb is given below

Week	1	2	3	4	5	6	7	8
Prob. Of failure	0.05	0.13	0.25	0.43	0.68	0.88	0.96	1.0

The cost of individual replacement is Rs . 4 per bulb. The cost of group replacement is Rs .1 per bulb. If there are   1000 bulb in use find the optimal replacement policy under
   g) Individual replacement
   h) Group replacement   (8)

Q.11 .a) A company plans the following activities promoting it's business

Activity	Description	Time (weeks)	Preceding activity
A	Organize sales office	6	-
B	Hire salesman	4	A
C	Train Salesman	7	B

D	Select advertising agency	2	A
E	Plan advertising campaign	4	D
F	Conduct campaign	10	E
G	Design package	2	-
H	Set up packing facilities	10	G
I	Package initial stock	6	H,J
J	Pace order with manufacture	13	-
K	Select Distribution	9	A
L	Sell to distribution	3	C, K
M	Transport the stock	5	I,L

1) Draw the network diagram

2) Determine the critical path

3) Find the total float , free float and the independent float of the activities.   (8)

Q.11.b) A small project is composed of 7 activities whose time estimated are listed in the table below.

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Optimistic time estimate	1	1	2	1	2	2	3
Most likely time Estimate	1	4	2	1	5	5	6
Pessimistic time Estimate	7	7	8	1	14	8	15

a) Draw the project network and identify all the paths through it

b) Find the expected duration and variance

c) What is the expected project length

d) Calculate the various and standard deviation of project length

e) What is the probability that the project will be completed at least three week earlier than expected ? No more than 3 week later than expected?

f) IF the project due to date us 18 week what is the probability of not meeting the due date?

g) What due date has about 90% chance of being met?   (10)

OR

9

Q.12 a) The utility data for a network is given below. The activity durations are in weeks and the cost in rupees. The indirect cost per day is Rs.1000 per week. Determine the optimum project schedule. (12)

Activity	Normal		Crash	
	Time (days)	Direct Cost (Rs.)	Time (Days)	Direct Cost (Rs.)
1-2	8	7000	3	10000
1-3	4	6000	2	8000
2-3	0	0	0	0
2-5	6	9000	1	11500
3-4	7	2500	5	3000
4-6	12	10000	8	16000
5-6	15	12000	10	16000
5-7	7	12000	6	14000
6-8	5	10000	5	10000
7-8	14	6000	7	7400
7-9	8	6000	5	12000
8-9	6	6000	4	7800

b) Define the terms (6)

(i) Dummy Activity

(ii) Looping

Activity on Node (AON) Diagram

UNIVERSITY OF PUNE

[4364]-503

B. E. (Production) Examination – 2013
ADVANCED PRODUCTION
TECHNOLOGY
(2008 Pattern)

[Time : 3 Hours]   [Max. Marks : 100]
Total No. of Questions : 12   [Total No. of Printed Pages :3]

Instructions :
*(1) Answers three questions from **Sections I** and three questions from **Section II**.*
(2) Neat diagrams must be drawn wherever necessary.
(3) Assume suitable data, if necessary.

SECTION I

Q1) a) Discuss 'Machining of monolithic Parts' [08]
    b) Explain briefly various types of dry machine tools and equipments. [08]

OR

Q2) a) Discuss 'Hard Part Machining' [06]
    b) Explain briefly various dry machining operations and compare near dry machining system. [10]

Q3) a) Explain briefly Nano scale machining opration. [08]
    b) Explain with neat sketch magnetic abrasive finishing. [08]

OR

Q4) a) Explain Nano precision CNC machining centre. [08]
    b) Explain the aspect of Nanomanufacturing [08]

Q5) a) What is cell design? What are factors affecting cell design and what are the cell design oriteria [10]
    b) Explain with neat sketch Rapid Prototyping Technique. [08]

OR

Q6) a) Explain with neat sketch online/In process and online post processes, offline inspection methods. [10]

b) Explain with flow chart ERP. [08]

SECTION II

Q7) a) Explain various types of automated guided vehicles with application, benefits and limitation [08]

b) Explain framework of Toyota Production System. [08]

OR

Q8) a) Write a short note on: [16]
i) design for automated assembly
ii) various feeds used in factory automation
iii) automated storage and retrieval system

Q9) a) Explain the following terms with respect to hydraulic motor. [06]
i) volumetric efficiency
ii) mechanical efficiency
iii) overall efficiency

b) For a swash plate type of pump following data operates: [10]
i)Number of piston = 4
ii) Piston diameter = 20 mm
iii) Pitch circle diameter of the cylinder = 150 mm
iv) Input power = 6KW
v) Volumetric efficiency = 90 %
vi) Mechanical efficiency = 89 %
find inclination angle of swash plate.

OR

Q10) a) A double acting cylinder is hooked up in the regenerative circuit the relief value setting is 100 bar. The piston area is 130 cm^2 and the rod area is 65 cm^2. If the pump flow is 95 LPM find the cylinder speed and load carrying capacity for the extending and retracting stroke. [08]

b) Draw a pneumatic circuit for a machine operated either by manual switch and to ensure that the work piece is properly clamped and door of the machine is not open. [08]

Q11) a) A mass of 25000 N is to be accelerated from rest to a velocity of 2.5 m/s [06]

over a distance of 100 mm calculate the bore diameter if coefficient of
friction between load and guide is 0.2

b) Draw a hydraulic circuit which will operate a hydraulic cylinder of a [06]
machine provision is required to hold end positions any where in
between the end positions.

c) Explain with neat sketch two stage air compressor. [06]

OR

Q12) a) What is 'open centre' and 'closed centre' value position of directional [06]
control value. Explain with sketch the importance and applications of
these centre positions of DCV.

b) Explain different types of accumulators and intensifiers. [06]

c) A pump has a displacement of $20 cm^3$/rcv is driven at 1440 rpm and [06]
120 bars the volumetric efficiency is 0.90 and overall efficiency is 0.8.
Calculate,

i) Pump delivery in LPM
ii) The input power at pump shaft in kw
iii) Drive torque at pump shaft

UNIVERSITY OF PUNE
[4364]-504
B. E. (PRODUCTION S/W) Examination -May 2013
MACHINE TOOL DESIGN (ELECTIVE I - I)
(2008 Course)

[Time: 3 Hours]　　　　　　　　　　　　　[Max. Marks: 100]

Instructions:

1 Answers to the two sections should be written in separate answer-books.

2 Black figures to the right indicate full marks.

3 Neat diagrams must be drawn wherever necessary.

4 Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

5 Assume suitable data, if necessary.

6 Answer any three questions from Section I and any three questions from Section II

SECTION -I

Q.1　A　Show that for the geometric progression ratio, the value lies between 1 & 2 Also prove that maximum loss of economic cutting speed is constant in geometric progression.　　6

　　　B　For designing a speed gear box, a machine tool to have a speed variation from 110 to 700 rpm in nine speed steps, draw all possible structural diagram and best structural diagram, Gear Box design calculations　　10

OR

Q.1　A　What are the design considerations in stepless drive　　6

	B	Explain why geometric series is preferred over arithmetic series	4
	C	What are the design consideration in design of feed gear box?	6
Q. 2	A	Why rigidity is important consideration in machine tool structure? How rigidity can be improved in an existing machine tool?	7
	B	Give the comparative evaluation of machine tool structures on the basis of	9

a) Materials for machine tool structures

b) Static and dynamic stiffness

c) Profiles of machine tool structures

OR

Q. 2	A	Explain design considerations for Design of beds, columns and housings with respect to machine tool structures	16
Q. 3	A	With a neat sketch, explain functions and different types of guideways	10
	B	Write a note on Stick-Slip motion in slideways	8

OR

Q. 3	A	Explain steps in Design of power screws with respect to Distribution of load & rigidity analysis	18

SECTION II

Q. 4	A	Write down the main features of spindle unit used in machine tool. Draw and explain with neat sketch a typical spindle end	10

	B	What are the recommendations for selection of material for spindle of machine tool	6

<div align="center">OR</div>

Q. 4	A	Explain analysis of antifriction bearings, preloading of antifriction bearing	16

Q. 5		Explain : (Any Two)	16

    i)   Dynamic characteristic of the cutting process,

    ii)   Stability analysis

    iii)   Vibrations of machine tools

<div align="center">OR</div>

Q. 5	A	Explain : (Any Two)	16

    i)   Control Systems: Mechanical & Electrical,

    ii)   Adaptive Control System

    iii)   Relays and push button control

Q. 6	A	Explain design considerations in SPM	10
	B	What are the recent trends in machine tool design? How the feedback systems used in CNC machine useful.	8

<div align="center">OR</div>

Q. 6	A	What is step by step procedure for a retrofitting of a machine tool	10
	B	Explain Design Layout of machine tool using matrices	8

UNIVERSITY OF PUNE
[4364]-508
B. E. (PRODUCTION S/W) Examination 2013
ERGONOMICS AND HUMAN FACTORS IN ENGINEERING
(2008 Course)(411125)

[Total No. of Questions:]   [Total No. of Printed pages :3]

[Time : 3 Hours]   [Max. Marks : 100]

Instructions :

    (1) *Answers any 3 questions from section I and three from section II.*

    (2) *Neat diagram must be drawn wherever necessary.*

    (4) *Figures to the right indicate full marks.*

    (5) *Assume suitable data, if necessary.*

SECTION I

UNIT I

Q.1   a) Discuss the role of work and rest from an ergonomics perspective.   [8]

       b) What is concept of strength and endurance from a MMH task design approach   [10]

OR

Q.2a) What are Human Machine systems? Explain its types.   [9]

   b) What are objectives of Human Factors Engineering   [9]

UNIT II

Q.3a) Which are the important principles used in the application of   [8]

anthropometric data?

   b) With a good example elaborate the arrangement for design of   [8]

workspace envelop for a seated-standing person.

OR

Q.4a) Why is no chair made for everyone? Discuss with a perspective   [10]

of principles of seat design.

b) Explain the importance principle of physical arrangement of components [6]
in space.

UNIT III

Q.5a) Discuss the types of information that is processed with visual displays. [8]

b) What do you mean by multifunction hand controls? Elaborate. [8]

OR

Q.6a) Explain with a neat diagram general arrangement of control in a [8]
physical space.

b) What do you mean by olfactory and olfactory displays? Discuss [8]
in brief.

SECTION II

UNIT IV

Q.7a) How is the color system explained with human factors perspective? [9]

b) Which are the main heat stress indices used in the industry? [9]

OR

Q.8a) What is the physiological impact of cold stress on performance? [9]
Does the performance improve?

b) What is noise? How to control noise at the receivers end? [9]

UNIT V

Q.9a) Discuss the task description and analysis in systems design. [8]

b) What are warnings? How is it important from a human factors [8]
perspective

OR

Q.10 a)What do you mean by interface design? What data is applicable in such situations? [8]

b) Discuss a case in which you have come across application of human factors engineering? [8]

UNIT VI

Q.11a) Discuss the following two concepts in MTM analysis [12]

1. Single basic MTM motions
2. Combination of basic MTM motions.

b) Define the following terms [4]

1. Method Study
2. Work Measurement

OR

Q.12a) Discuss the elements of micro and macro motion analysis. [10]

b) What do you mean by mini most? Discuss in brief. [6]

University of Pune
B.E. Production (S/W)
4364-509
Examination - 2013
Materials Management &
Logistics
(2008 Pattern)

Total No. of Questions : 12   [**Total No. of Printed Pages :2**]

[**Time : 3 Hours**]   [**Max. Marks : 100**]

SECTION I

Unit I

Q1. A) Explain scope of materials management.   [9]

   B) Explain MRP in detail.   [9]

OR

Q2. A) Define value engineering. Explain various phases of value analysis.   [9]

   B) Explain Break Even Analysis.   [9]

UNIT II

Q3. A) Explain Purchase cycle with flowchart.   [8]

   B) Explain Import substitution.   [8]

OR

Q4. A) What are the factors to evaluate potential supplier.   [8]

   B) Define Vendor Rating. Explain any one method with example.   [8]

UNIT III

Q5. A) Describe CIFO & FIFO methods of issuing of materials with its advantages
   & disadvantages.   [8]

   B) Explain waste disposal system.   [8]

OR

Q6. A) Write a short note on :   [16]
   1. Bin Card
   2. Stock recording process
   3. Inward and outward register.

SECTION II

UNIT IV

Q7. A) Explain various modes of transportation.   [8]
     Decide the factors for selecting best mode.
   B) Explain various types of warehouse.   [8]
Q8. A) What are the functional areas of logistics.   [8]
   B) Explain different components of logistics.   [8]

UNIT V

Q9. A) Explain various costs associated with inventory decisions.   [8]
   B) Explain ABC Analysis in detail with example.   [8]

OR

Q10. A) What is EOQ? Derive an expression for the economics order Quantity when
     the stock replenishment is instantaneous (give assumptions).   [8]
     B)Explain various types of inventories giving reasons for the requirement of
     each.   [8]

UNIT VI

Q11. A) Derive the formula for EMQ. Sate the assumptions made.   [9]
   B) Explain & differentiate between fixed order Quantity and Fixed Period
   system.   [9]

OR

Q12. A) from the following information in respect of material Y, calculate the
     optimum ordering quantity. The annual demand for material is 4000kgs, carring
cost are 10% of the material cost per annum. The ordering cost is Rs. 10 per order.

Ordering Quantity	Price/Kg
$Q \leq 250$	6.00
$250 \leq Q < 800$	5.90
$800 \leq Q < 2000$	5.80
$2000 \leq Q < 4000$	5.70
$4000 \leq Q$	5.60

                                                                                       [9]
B) Define following terns related to inventory and also show graphically.   [9]
   1. Lead Time
   2. Recorder Level
   3. Safety stock
   4. Average inventor level

4364-510
B.E. (prod-sw)
FINANCIAL MANAGEMENT AND COST CONTROL
(2008 Pattern) (Elective - II) (Semester - I)

Time: 3 Hours   *Max. Marks : 100*

Instructions to the candidates:
1) ***Answers to the two sections should be written in separate answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Solve Q1 or Q2, Q3 orQ4, Q5 or Q6 from Section –I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section -II***
5) ***Use of Calculator is allowed.***
6) ***Assume Suitable data if necessary.***

SECTION I

Q1) a) Discuss in detail the financial management and explain its scope   [8]

  b) What is Ratio analysis ?Discuss role of Ratio analysis as the too and technique in financial management.   [8]

OR

Q2) a) The following are the figures extracted from the books of PQR ltd.conpany as at 1/4/2011   [10]

Particulars	amount(Rs)
Net sales	2400000
Operating expenses	1800000
Gross profit	600000
Non operating expenses	240000
Net profit	360000
Current assets	760000
Inventories	800000
Fixed assets	1440000
Total assets	3000000
Net Worth	1500000
Debt	900000
Current liabilities	600000
Total liabilities	3000000
Working capital	960000

Calculate –gross profit ratio,net profit ratio, return on assets,inventory turn over,net worth to debt

  b) Discuss the method of preparing the profit and loss account   [6]

Q3) a) Discuss capital expenditure and its importance   [9]

  b) Explain in brief-a) pay back period, b)return on investment method   [9]

OR

Q4) a) Explain essential features for effective operating of control of capital expenditure   [9]

b) Compare the profitability of the machine P and q each of which costs Rs8000 and has working life two years. cash flow for the machines are- **[9]**

	Machine P	Machine Q
Year 1	Rs. 6000	Rs. 4000
Year 2	Rs 4000	Rs. 6000

Assuming a 10% discount rate.

Q5) a) Explain the concept of funds and funds flow statements and state the advantages of fund flow statements **[8]**

b) What is Working Capital? Discuss types of working capital, **[8]**

OR

Q6) a) Explain concept of time value of money and cost of capital. **[8]**
b) Explain different ways for sources of working capital **[8]**

SECTION II

Q7) a) The following figures have been extracted from XYZ Co.for the year ending2012 **[10]**

	Rs
Direct material cost	80000
Direct wages	40000
Indirect wages	10000
Direct expenses	12000
Electric power	1000
Depreciation of office building	1000
Depreciation of plant and machinery	2000
Directors fees	2000
Oil and waste	200
Lubricants	300
Postage	500
Lighting- factory	1000
- office	400
Carriage outwards	300
Printing and stationary	500
Selling expenses	2000
Traveling expenses	1000
Rent –factory	2000
- office	1000

From above figures calculate prime cost, factory cost, production cost, cost of sale

b) What is mean by overhead? Explain different types of overheads

[6]

OR

Q8) a) Explain any two methods of depreciation

[8]

b) Form the following particulars you are required to work out the earnings of a worker for the week under (a) straight piece rate, (b)Rowans premium scheme **[8]**

Weekly working Hrs	48
Piece rate / unit	Rs. 3 / -
Hourly wage rate	Rs. 7.50
Normal time taken per piece	20 minutes
Normal output / week	150 piece

Q9) a) Define and explain briefly the following variances- [8]
a)material price variance ,b)material usage variance ,c)material mixture variance, d)material yield variance

b) Construct a flexible budget for production at 80 % and 100% capacity
Production capacity at 60% capacity   12000 units
Material   Rs 0.50 per uint   [8]
Labor   Rs 0.40 perunit
Overheads   Rs 0.10 perunit
Factory on cost Rs 4000 (40 % fixed)
Admin.Expenses Rs.3000 (60% fixed)

OR

Q10) a) Find out the material (cost, price, usage, mix) variances from the following data [8]

	Standard			actual		
	Kgs	Rate	amount	Kgs	Rate	amount
A	100	5	500	120	4	480
B	50	6	300	60	5	300
	150		800	180		780

b) Define budget control .What are the pre-requisites for the implementation of budget control [8]

Q11) a) What is standard costing ?How does it help in keeping a control over costs .Point out its limitations [6]

b) Discuss the importance of the following terms in relation to marginal costing- [6]
a) break even point, b)P/V ratio, c) margin of safety

c) What is a break even chart ?state the purposes of constructing such graph [6]

OR

Q12) a) Define marginal cost and marginal costing .How variable costs and fixed costs [6]

are treated in marginal costing?

b) The BOD a company gives following information [12]

Sale (100000 units) -   Rs 1000000

Variable costs   Rs 40000

Fixed costs   Rs 50000

a)find out P/v ratio, BEP, margin of safety

b) evaluate the effects on P/V ratio , BEP, margin of safety of the following

i) 20% increase in physical sales volume,

ii)10% increase in fixed cost

UNIVERSITY OF PUNE
[4364]-512
B.E. (Production Sandwich) Examination - 2013
Supply Chain Management
(2008 Course)(411130)

[Time: *3* Hours]   [Max. Marks: 100]

Instructions:

1 **Answer** *three questions from section I and three questions from section II.*

3 *Your answers will be valued as a whole.*

5 *Assume suitable data, if necessary.*

SECTION –I

UNIT 1

Q.1　A　What is Supply Chain. Explain the stages in a supply chain with a good example.　[9]

　　B　What are the obstacles to achieving a strategic fit?　[9]

OR

Q.2　A　Explain how to achieve strategic of fit through understanding the customer and supply chain uncertainty?　[9]

　　B　Explain the components of pricing decisions　[9]

UNIT 2

Q.3　A　What are the characteristics of a forcast in supply chain?　[8]

　　B　What is the roles of aggregate planning in supply chain management　[8]

OR

Q. 4　Explain the basic approach to demand forcasting and its　[16]

six step process?

UNIT 3

Q. 5   A   Identify cycles & push-pull boundary in supply chain when you are **purchasing Samsung galaxy Note Phone** from a shop in your city.   [12]

      B   Explain and two measures of forecast errors?   [4]

OR

Q. 6   A   Explain the role of cycle inventory in supply chain?   [8]

      B   What are the economies of scale exploit quantity discounts?   [8]

SECTION II

UNIT 4

Q. 7   A   Discuss any three modes of transportation popularly used in SC decisions. Discuss with good examples   [6]

      B   What are the factors influencing network design decisions? Discuss any two.   [12]

OR

Q. 8   A   Explain the following design options for a transportation network   [18]

           Direct shipping with milk runs

           All shipments via DC

           Tailored Network

UNIT 5

Q. 9   A   What are the different effects seen because of Bullwhip Characteristics in demand fluctuations in SC?   [8]

      B   Discuss the impact of E Business on customer service in book industry   [8]

<div align="center">**OR**</div>

| Q. 10 | A | What are the characteristics the information must have to be useful. When making supply chain decisions? | [8] |
| | B | Explain the supply chain macro processes in IT framework | [8] |

<div align="center">**UNIT 6**</div>

| Q. 11 | A | Explain the role of pricing and revenue management in supply chain management. | [8] |
| | B | Explain the role of IT in pricing and revenue management | [8] |

<div align="center">**OR**</div>

| Q. 12 | A | How to evaluate network design decisions using decision trees? | [10] |
| | B | Explain the process of risk management in network design | [6] |

UNIVERSITY OF PUNE
[4364]-514
B.E. (Production Sandwich)
Examination-2013
Industrial Relation& Human Resource Management
(Elective III) [411130] 2008 Course

[Time: 3 Hours]   [Max. Marks: 100]

Instructions:

1. Answer three questions from Section I and 3 questions from Section II.
2. Answers to the two sections should be written in separate answer-books.
3. Neat diagrams must be drawn wherever necessary.
   4. Black figures to the right indicate full marks.
   5. Assume suitable data, if necessary.
6. Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator & steam tables is allowed

SECTION–I

Unit I

Q.1   (A)   What is Industrial Relation? Explain with scope & objectives.   [9]

       (B)   Define collective Bargaining. Explain the reasons for its success and failure.   [9]

OR

Q.2   (A)   Explain in detail about the impact of globalization and information technology on industrial relations.   [9]

       (B)   What is trade union? Explain the problems faced by trade union.   [9]

Unit II

Q.3   (A)   Explain Personnel Administration. State its objectives and principles.   [8]

	(B)	Describe elements of HRD systems. Also discuss their goals, elements.	[8]

<div align="center">**OR**</div>

Q. 4	(A)	Explain structure of HR department & role of HR manager.	[8]
	(B)	Discuss HR strategies and organizational strategies.	[8]

Unit III

Q.5.	Write short Notes (any two)	[16]
	a) Objectives of manpower planning	
	b) Succession planning	
	c) Promotion	

<div align="center">**OR**</div>

Q. 6.	Write short Notes (any two)	[16]
	a) Recruitment resources	
	b) Reward and compensation strategies	
	c) Job rotation	

<div align="center">**SECTION II**</div>

Unit IV

Q.7	(A)	Discuss need & objectives of employee training.	[9]
	(B)	What are major procedures of training?	[9]

<div align="center">**OR**</div>

Q.8	(A)	Discuss various methods of training.	[9]
	(B)	Explain tools & aids used for effective training.	[9]

Unit V

Q.9	(A)	Discuss various methods of performance appraisal.	[8]
	(B)	Explain strategic importance of 360 degrees feedback.	[8]

<div align="center">**OR**</div>

Q.10	(A)	Explain in detail competency Mapping.	[8]
	(B)	Explain how performance management system can be aligned with business strategies of an organization.	[8]

Unit VI

Q.11.	Write short notes on (any TWO)	[16]
	(1) Industrial democracy	
	(2) Golden handshake	
	(3) Role of HRD in developing IR	

<div align="center">**OR**</div>

Q.12.	Write short notes on (any TWO)	[16]
	1) Retrenchment and layoff	
	2) Employee Morale	
	3) Downsizing and project based employment	