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

B.E. Production.

Examination - 2013

APPLIED SCIENCE -

Production Management.

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

Instructions :

(1) Answer ***any 3 questions from each section.***

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

(3)Figures to the right indicate full marks.

(4) Use of logarithmic tables slide rule, Mollier charts, Electronic packet calculator and steam tables is allowed.

(5) Neat diagrams must be drawn whenever necessary.

(6) Assume suitable data, if necessary.

Section- I

Unit –I

Q1. (a) Differentiate between production and production management. Explain in brief objectives of Production management. (08)

(b) Explain Product life cycle in brief. (08)

OR

Q2. (a) Explain production interface with other functional area of the business such as purchasing, personal, finance, material, maintenance & ppc etc. (08)

(b) Explain standardization, simplification and specialization in relation of product design & development . (08)

Unit II

Q3. (a) Explain different principles and material handling. (08)

(b) Explain principles and plant layout. (08)

OR

Q4. (a) What are the factors considered while selecting location for an foundry plant? (08)

(b) What are the different types of plants layout? Explain any one with its advantages & disadvantages with its application. (08)

Unit III

Q5 (a) Explain in detail what do you understand Manpower Inventory. (09)
(b) What is productivity Improvement program (PIP)? Explain (09)

OR

Q6. (a) Explain different productivity Ratios.
What are the different factors affect as productivity. (09)
(b) Explain different factors considered for resources (man power) supply fore casting . (09)

Section- II

Unit IV

Q7. (a) Explain in brief evolution of world class manufacturing (WCM). (09)
(b) Explain in brief Maskal's model of WCM. (09)

OR

Q8. (a) What is manufacturing excellence through value add manufacturing? (09)
(b) What are the business challenges in information age? (09)

Unit v

Q9 a)What is Industrial maintenance explain primary and secondary functions of maintenance? (08)
(b) Explain how performance of maintenance function is evaluated? (08)

OR

Q10. (a) What are the operating practices used to reduce maintenance work? (08)
(b) Explain the concept of total productive maintenance (TPM)in brief. (08)

Unit-VI

Q11. (a) Explain „Green manufacturing in brief. (08)
(b) What are the responsibilities of Industrialists Environment and Ecology. (08)

OR

Q12. (a) Explain the types of energy audit? Explain each type in brief. (08)
(b) Explain "Lean Manufacturing" in brief. (08)

UNIVERSITY OF PUNE

[4364]-84

B.E. (Production) Examination - 2013

Advance Material Processing

(2003 Course)

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

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

Instructions:

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

(2) Black figures to the right indicate full marks.

SECTION-I

Q. 1. A) Explain with neat sketch regarding to hard part machining. (8)

i) Mechanism of material slide how during turning

ii) Typical were types in CBN finish hard turning

B) Explain cutting speed ranges for seven typical machining operation and materials of different machining rating. (8)

OR

Q.2. a) Describe with neat sketch following special machining processer (16)

i. Oscillating turning

ii. Vibration Assisted machining

Q.3 Explain with neat sketch ultrasonic impact grinding.

a) Process and also describe the various characteristics of USM process. (10)

b) Describe advances in thermal energy method. (6)

OR

Q.4 Describe (16)

i. Chemical milling

ii. Photochemical milling

Q. 5 a) Explain with the help of neat sketch advance in following forming processes. (18)

i. Ring rolling

ii. Forging of stainless steel

OR

Q. 6 a) Write a short note on (18)

i. Auto for cast processes.

ii. Impact Extrusion

SECTION-II

Q. 7 a) Explain with the help of neat sketch following advanced casting Processes. (16)

i. Injection casting
ii. Continuous casting

OR

Q. 8 Write a short note on (16)

i. Asarco process
ii. Direct chill process

Q. 9 a) Explain with neat sketch ceramic shell process. (8)

b) Describe master mould casting (8)

OR

Q. 10 Describe following process equipment (16)

i. Forming
ii. Moulding

Q. 11. Explain with neat sketch

a) Different surface cleaning methods (12)

b) Explain briefly Mano surface machining method. (6)

OR

Q. 12 Write a short note on (18)

i. Ligo technique for fabrication
ii. MEMS fabrication
iii. Polymer

University of Pune

Examination May 2013

B. E. (Production) (2003 Course) 4364-74

Sub: OPERATIONS RESEARCH

Instructions:

1. **Answers to two sections should be written in separate answer sheets**
2. **Solve Q1 or 2, Q3 or 4, Q5 or 6, Q7 or 8, Q9 or 10, Q11 or 12**

SECTION –I

1. (a) What is significance of duality theory in LPP? "Dual of Dual is primal" explain in brief. [6]

   (b) Use the two phase method to [10]

   minimize $Z=x_1+x_2$

   S. t. $2x_1+x_2\geq4$

   $x_1+7x_2\geq7$

   $x_1,x_2\geq0$

OR

2. (a) Express linear programming problem in its general, canonical & standard form. [6]
   (b) Find the optimal solution by simplex method [10]

   Min. $z=x_2+3x_3+2x_5$

   s.t. $3x_2-x_3+2x_5\geq7$

   $-2x_2+4x_3\geq12$

   $-4x_2+3x_3+8x_5\geq10$

   $x_2,x_3,x_5\geq0$

3. (a) Explain the similarities and differences between transportation and transshipment problem [6]

   (b) Find the optimum solution to the following transporation problem in which the cells contain the transportation cost in Rs. [12]

	W1	**W2**	**W3**	**W4**	**W5**	Available
F1	7	6	4	5	9	40
F2	8	5	6	7	8	30
F3	6	8	9	6	5	20
F4	5	7	7	8	6	10

Required	30	30	15	20	5	100(Total)

OR

4. (a) Discuss the assignment model Indicate the method of solving the traveling salesman problem. [8]
   (b) State the comon and distinguishing features of assignment model and write its applications. [10]

5. (a) Explain the concept of Gomory's cutting plane method. [8]

   (b) State the Bellman's principle of optimiality and explain how it is used for solving dynamic programming problem. [8]

OR

6 (a) Write note on integer programming and non-linear programing. [8]
   (b) Solve the following problem by branch and bound method: [8]
   Max. $z= x_1+x_2$
   S. t. $3x_1+2x_2\leq 20$
   $6x_1+5x_2\leq 25$
   $X_1+3x_2\leq 10$
   X_1, x_2 are non negative integers.

SECTION -II

7. (a) Write a note on goal programming. [8]

(b) A system contains 10000 resistors. When any register fails it is replaced. The cost of replacing each resistor is Rs. 1. If all registers are replaced at a same time the cost per register is reduced to 35 paise. The percent surviving at the end of the month are:

End of month	0	1	2	3	4	5	6
Probability of failure during the month	0	0.04	0.06	0.25	0.30	0.15	0.20

What is optimum replacement plan? [8]

OR

8. (a) Explain the concept of geometric programming. [8]

(b) Manufacturer produces 2 products A and B using two limited resources labour and raw material. A unit of product A requires 2 Hrs. of labor time and 3 units of raw material while a unit of product B

requires 4 Hrs. of labour time and 4 units of raw material. Everyday 28 Hrs. of labor time and 32 units of raw material are available. The goal before him in accordance with priorities atre as follows:

1) The profit per day should be atleast Rs. 44 assuming that the profit per unit of Product A and B is Rs. 8 and Rs. 6 respectively.

2) No. of units of product A produces should be twice that of B

3) The labor time should be fully utilised.

Formulate G. P. model for the problem and solve using G. P. [10]

9. (a) Explain in brief the characteristics of queing models. [8]

(b) A branch of Punjab National bank has only one typist. Since the typist work varies in length, the typing rate is randomly distributed approximating the poissons distribution with a mean service rate of 8 letters per hr. The letters arrive at rate of 5 per Hr. during 8 Hr. work day. If the typewriter is valued at Rs. 1.5 per Hr. Determine

1. Equipment utilisation

2. The percent time the arrival letter to wait

3. Average system time

4. Average cost due to waiting on the part of typewriter. [10]

OR

10. (a) Explain the Kendal notation for representing the queing models. [6]

b) Find the saddle point and hence solve the following game: [10]

	B1	B2	B3	B4
A1	1	7	3	4
A2	5	6	4	5
A3	7	2	0	3

11. (a) Explain the following terms: a) earliest time b) latest time c) slack d) event [8]

(b) A project schedule has following characteristics: [8]

Activity	Time	Activity	Time
1-2	2	4-8	8

1-4	2	5-6	4
1-7	1	6-9	3
2-3	4	7-8	3
3-6	1	8-9	5
4-5	5		

a)Construct the PERT network, find critical path and time duration of project.

b) Total float for each activity.

OR

12. (a) Explain the following: [8]

i) Difference between PERT and CPM

ii) Resource smoothing

iii) Dummy in network analysis

iv) Difference between activity and event.

(b) Consider the following project: [8]

Activity	Predecessor	Optimistic	Most likely	Pessimistic
A	-	3	6	9
B	-	2	5	8
C	A	2	4	6
D	B	2	3	10
E	B	1	3	11
F	C,D	4	6	8
G	E	1	5	15

a) Draw network diagram for project.

b) Dtermine the critical path.

c) Calculate the variance and standard deviation.

d) What is probability that project will be completed by 18 weeks.

Z	0	0.5	1	1.5	2.0
Probability	0.5	0.692	0.841	0.933	0.977

UNIVERSITY OF PUNE

(4364)-72

B.E. (Production Sandwitch & Production) Examination – 2013

MACHINE TOOL DESIGN

(2003 Pattern)

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

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

Instructions:

(1) Answers any five.
(2) Figures to the right indicate full marks.
(3) Neat diagrams must be drawn whenever necessary.

SECTION I

Q1 a) Discuss the basic design procedure of machine tool structures. [10]

b) Explain why box type structure is adapted for construction of machine tools. [5]

c) Draw and Explain commonly used machine tool bed wall arrangements and mention their applications. [5]

Q2. a) Explain with examples "working" and "auxiliary" [7]

b) State the advantages and limitation of a hydraulic drive. [6]

c) Explain with a diagram, the features of positive infinity variable drive (PIV) [7]

Q3. a) Discuss the recent trend in machine tools in the industry. [7]

b) Discuss the design requirements for SPM machine tool in an industry. [7]

c) Design layout of machine tool using matrices. [6]

SECTION II

Q4. a) Explain with sketches, the following shapes of guide ways.
i) Flat ii) „V' Type iii) Dovetail type.
State their advantages & applications. [10]

b) State the functions and requirements of guide ways. [5]

c) Explain advantages of ball screws over. [5]

Q5. a) Compare the performance of hydrostatic and hydrodynamic bearings used for spindle supporting machine tool. [5]

b) Discuss the function of spindle unit and it's design requirements [5]

c) State the advantages of antifriction bearings used for supporting machine tool spindles. Also mention the specific advantage of angular contact ball bearing. [5]

d) Sketch & explain hydrostatic journal. [5]

Q6. Explain the different sources of vibrations in.
A) Machine tools. Also explain the effects of these vibrations. [10]

B) Enumerate the functions and requirements of a machine tool control system. [10]

UNIVERSITY OF PUNE
[4364]-73
B.E.(Semester - I) Examination -2013
B.E (Production)
Manufacturing automation and control
(2003 Course)

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

Instructions :

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

SECTION 1

Q.1 a) Derive the expression for flow in case of swash plate type axial piston pump. [8]

b) A pump with a delivery of 25 lpm is fed into a pipe with total volume of 20 liters. if the end of pipe is suddenly blocked, calculate the rise in pressure after 4 seconds if bulk modulus is 1800mpa. [4]

c) Explain with neat sketch the hydraulic circuit showing the application of counterbalance vale [4]

OR

Q.2 a) Explain various criteria for selection of a hydraulic pump. [8]

b) A mass of 3000 kg is to be accelerated from rest to a velocity of 2 m/s over a distance of 65mm. Calculate the bore diameter of cylinder if coefficient of friction between load and guide is 0.15. [8]

Q.3 a) A hydraulic system requires 275 I/ min at 45 bar for 20 seconds and 25 I/min at 365 bar pressure for 30 seconds. Compare the efficiency of the system when operated with and without pressure intensifier. [8]

b) Explain hydraulic servo mechanism. [8]

OR

Q.4 a) Explain with neat sketch the working principle of regenerative circuit. [8]

b) A hydraulic system having total cycle time of 42 seconds required 18 I/min flow for 10 seconds. Determine the size of gas accumulator assuming isothermal expansion and compression of gas. Assume discharge pressure 150 MPa. [8]

Q.5 a) Explain the use of turbulence amplifier for logic circuit. [6]

b) Explain with neat sketch the working of a time delay valve. [6]

c) Explain the advantages of pneumatic system over hydraulic system [6]

OR

Q.6 a) Draw a pneumatic circuit to actuate the cylinder if sensors C and D are in the same state [ON or OFF] as that of sensor B and sensor A is in opposite state. [10]

b) Explain with suitable example the use of twin pressure valve as AND gate. [8]

SECTION 2

Q.7 a) How many status flag does 8085 have? Discuss the role of each flag. [8]

b) Explain the digital to analog converter as an input device. [8]

OR

Q.8 a) Explain with suitable example the use of accumulating time in PLC [8]

b) Draw ladder diagram that can be used to start a motor and then after a [8]

delay of 120 second start a pump. When the motor is switched off there should be a delay of 15 second before the pump is switched off.

Q.9 a) Explain the operation of PLC with suitable sketch. [8]

b) Explain with suitable example the use of counters in PLC. [8]

OR

Q.10 a) How would a derivative controller with $k_D = 5_s$ responds to an error that varies as 1.8 sin [0.08t]? [6]

b) Explain linear feedback control system. [10]

Q.11 a) Derive an expression for the limiting velocity of escapement of the cylindrical workpiece through a slot. [6]

b) Explain with neat sketch various rotary transfer devices. [6]

c) Explain with suitable example the gravity fed magazine, weight operated magazine, and friction fed magazine. [6]

OR

Q.12) Write short notes on : [18]

a) Turn table for orientation of workpiece

b) Non-vibratory feeders

c) Design for automated assembly

UNIVERSITY OF PUNE

[4364-75]

B.E.(Production Engineering & Industrial Engineering)

Examination 2013

Reliability Engineering

(2003 pattern)

Time-Three hours **Maximum Marks-100**

[Total No. of Question=11] **[Total no. of printed pages= 6]**

Instructions:

(1)Answer any 3 questions from each section.

(2)Answer to the TWO sections should be written in separate answer books

(3)Neat diagrams must be drawn whenever necessary.

(4)Figures to the right indicate full marks.

(5)Use of non-programmable electronic pocket calculator is allowed.

(6)Assume suitable data whenever necessary.

SECTION-I

Q.1 (a)A series of test conducted under certain stipulated conditions on 800 electronic components,the total duration of tests is 15 hrs.The number of components that fail during each hourly interval id noted.The results obtained are tabulated as shown in table. (12)

Time (t)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No. of Failures	0	120	85	71	62	53	45	41	37	35	29	50	45	63	35	29

Based on the failure data or survival test results shown in table.Define & Calculate failure density(fd):Failure rate(Z)and Reliability (R).

(b)Explain with neat sketch different failure modes of 'Bath tub' curve. (4)

OR

Q.2 (a)In order to test the strength of a new glue,ten similar structures constructed using the glue were subjected to a continuous vibratory load, and the duration of survival of each structure was noted,the values obtained the following. (6)

Specimen Numbers	1	2	3	4	5	6	7	8	9	10
Hours of survival	60	62	58	50	61	55	59	62	54	55

Calculate the mean time to failures (MTTF)from this data.

(b)In a test involving continuous satisfactory performance of 110 electronic instruments under excessive vibration conditions,the following failure frequencies were observed,the total test period being 8 hrs. (6)

Time interval	0-1	1−2	2−3	3−4	4−5	5−6	6−7	7−8
Number of failures	3	16	22	42	11	9	4	3

Calculate the mean time to failures (MTTF)From this data.

(c)Define reliability & discuss in it details. (4)

Q.3 (a)Explain the concept of “Techno-Physico Constraints' with a conceptual system. (6)

(b)Construct a fault tree from.Fig .1 such that the top event is a system failure and component failures are basic events.If Pr {A}=Pr{B}=0.9, Pr{C}=Pr{D}=0.8 and Pr{E}=Pr{F}=0.75 ,compute the probability of the top event. (10)

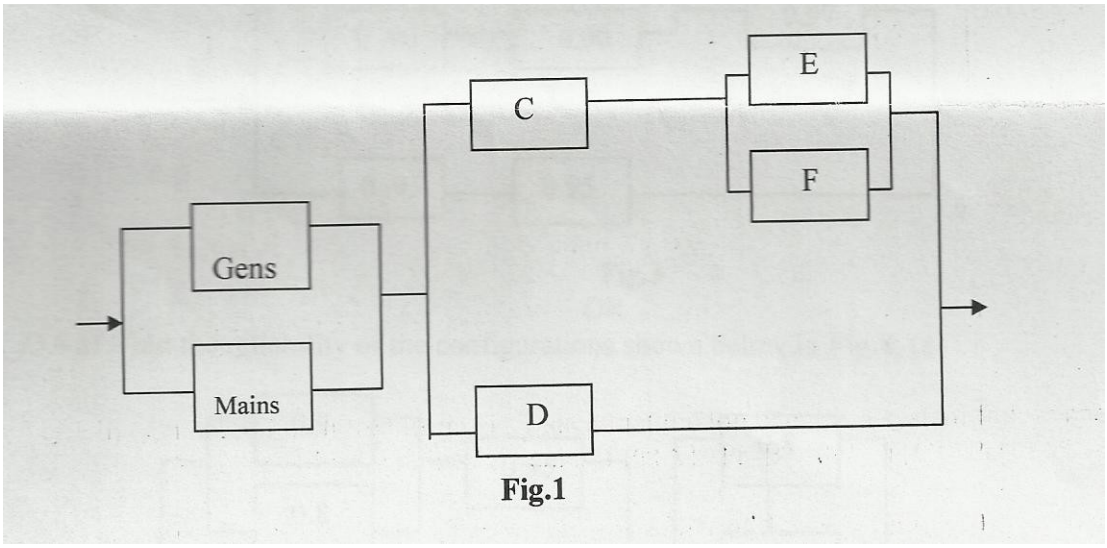

Fig.1

OR

Q.4 (a)Construct a reliability block diagram for given fault tree. Fig.2 (8)

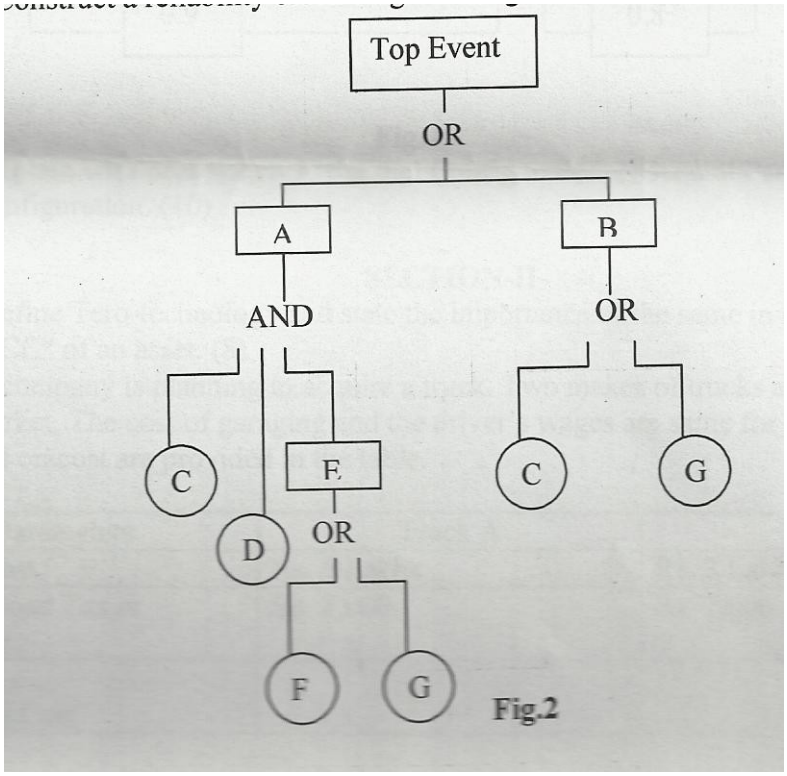

Fig.2

(b)Differentiate between :Design FMEA and Process FMEA. Explain methodology of system analysis. (8)

Q.5 (a)Explain with neat sketch 1)Series Configuration 2)General Series-Parallel configuration. (10)

(b)Find the system reliability of the configuration fig.3 (8)

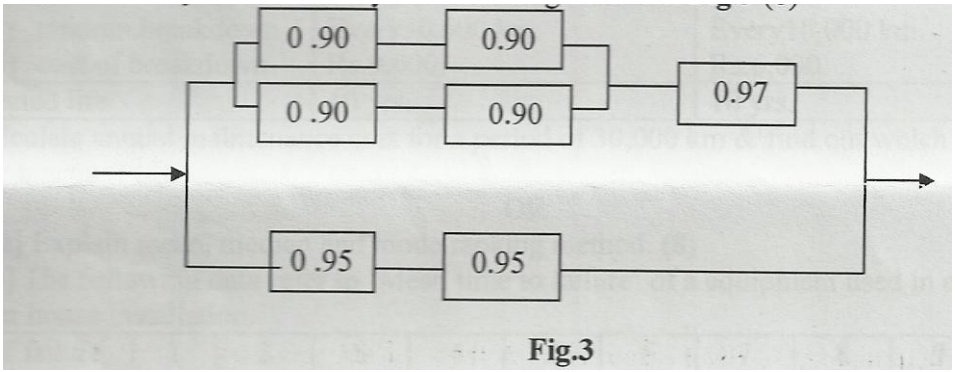

Fig.3

OR

Q.6 (a)Find the reliability of the configurations shown below in fig 4. (8)

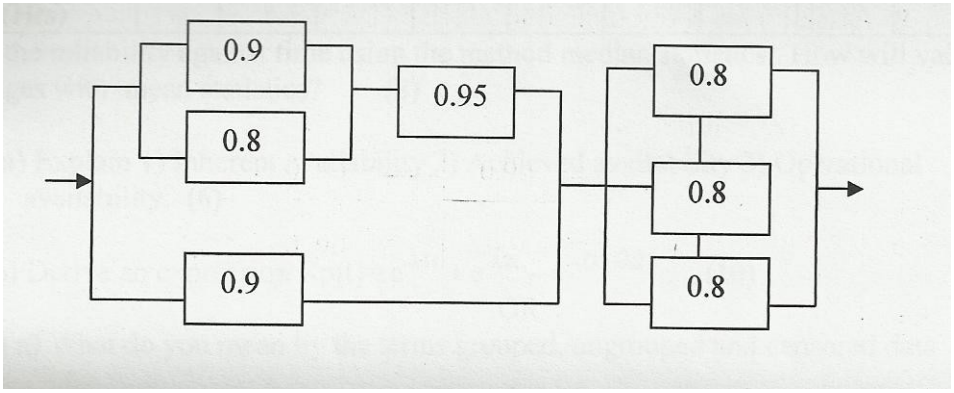

Fig. No. 4

(b)Explain with neat sketch.1)Parallel Configuration 2)General Parallel-Series configuration. (10)

SECTION-II

Q.7 (a)Define Tero-Technology and state the importance of the same in evolving the "LCC" of an asset. (8)

(b)A company is planning to acquire a truck. Two makes of truck are available in the market. The cost of garaging and the driver's wages are same for both. The other data on cost are provided in the table. (8)

Parameters	Truck A	Truck B
Capital cost	Rs.5 Lakhs	Rs.3 Lakhs
Annual Road Tax & Insurance	Rs.8000	Rs.7000
Operating cost (a)Fuel consumption (b)oil consumption (c)Fuel cost (d)oil cost	 20Km/Lit 2 lit/1000km Rs.3/lit 25/lit.	 20Km/Lit 2 lit/1000km Rs.3/lit 25/lit.
Maintenance Cost (a)Service interval (b)cost of service (c)random breakdown (d)cost of breakdown	 Every 7000 km. Rs.3,000 Every 30,000km Rs 9,000	 Every 4000 km. Rs.5,000 Every 10,000km Rs 6,000
Expected life	10 yrs.	10 yrs.

Calculate annual maintenance cost for a period of 30,000 km & find out which truck is advantageous? (8)

OR

Q.8 (a)Explain mean ,median and mode ranking method. (8)

(b)The following data refer to 'Mean time to failure 'of a equipment used in electric power house installation.

No.of failure	1	2	3	4	5	6	7	8	9
MTTF/MTBF(Hrs)	31.3	45.9	78.3	22.1	2.3	4.8	8.1	11.3	17.3

Plot the reliability against time using the method median statistics .How will values changes with mean statistics? (8)

Q.9 (a)Explain 1)Inherent availability 2)Achieved availability

3)Operational availability. (6)

(b)Derive an expression $Rp(t)=e^{-\lambda 1t}+e^{-\lambda 2t}-e^{-(\lambda 1+\lambda 2)t}$. (10)

OR

Q.10 (a)What do you mean by the terms grouped ,ungrouped and censored data. (6)

(b)the following data have been collected at the plant. (6)

Mean time before failure=60hrs

Mean time to repair =30hrs.

Administrative logistic time is 30 % of /mean Down Time.(MDT).

Calculate the operational availability and inherent availability of the plant.

(c)Explain the term availability and inherent availability of the plant. (4)

Q.11 Write a short note on.(Any 3) (18)

(1)Mixed configuration in system reliability

(2)Reliability &Quality

(3)k out of m systems

(4)Types of maintenance system

(5)Risk priority number in FMEA

(6)"Tie-set" & "cut set".

4364-77

B. E. (Production)- 2003 Course

Plant Engineering and Maintenance

SECTION I

Q: 1 (a) What is the effect of maintenance function on productivity of a firm. **[8]**

(b) Explain with suitable example the effect of social, legal, and political factors on selection of plant location. **[8]**

OR

Q: 2 (a) What factors should be considered for site selection of (i) educational instituions (ii) Hotels and restaurants (iii) Banks (iv) Hospitals **[8]**

(b) How will you estimate the capacity requirement for water and manpower for a plant **[8]**

Q: 3 (a) Which are the various charting techniques used in 'flow of materials' analysis of stage of SLP. **[8]**

(b) A manufacturer is interested in creating a cellular manufacturing layout with its current machines. A chart below shows the machines required by each part and the sequence of operations. Organise the machines and parts into two production cells that minimises the number of exceptional parts. **[8]**

		Parts					
		1	2	3	4	5	6
Machines	A	1	1			1	
	B			1	1		
	C	2	2				
	D		3	2			1
	E	3				2	
	F				2		2

OR

Q: 4 (a) What is significance of PQ analysis and PQRST concept in systamatic plant layout. **[8]**

(b) Explain in short various fire prevention practices. **[8]**

Q: 5 (a) Explain following principles of material handling. **[10]**

i) Space ii) Gravity iii) Simplification iv) Unit load v) System approach

(b) In a automated material handling system AGVs are used for material handling. A number of deliveries and empty returns are indicated in a from-to chart in Table 1. The corresponding distances are indicated in Table 2. The speed of an AGV is 100 ft/min. Considering a traffic factor of 0.9, determine: **[8]**

i) The total transport work.

ii) Average total time per delivery, the handling system efficiency, and the resulting average number of deliveries per hour.

iii) Number of vehicles needed to satisfy the indicated deliveries per hour.

Table 1: From-To chart showing number of moves per hour between different stations

	To			
From	**1**	**2**	**3**	**4**
1	0	7D	5D	3D
2	4E	0	0	3D
3	5E	0	0	0
4	6E	0	0	0

(Deliveries indicated by 'D' and Empty moves indicated by 'E')

Table 2: From-To chart showing distances between different stations

	To			
From	**1**	**2**	**3**	**4**
1	0	150	100	130
2	150	0	NA	80
3	100	NA	0	NA
4	130	NA	NA	0

(NA: not applicable)

OR

Q: 6 (a) Write short notes on: **[18]**

i) Auxiliary services in plant ii) sewage treatment iii) Effluent water treatment

SECTION II

Q:7 (a) Explain primary and secondary functions of the maintenance department. **[8]**

(b) Explain the procedure of preventive periodic maintenance. **[8]**

OR

Q: 8 (a) Explain the organization structure of a maintenance department. **[8]**

(b) Explain various models for calculating life cycle costs. **[8]**

Q: 9 (a) Discuss various factors which need to be considered for implementation of efficient spare part control system. **[8]**

(b) Explain various types of lubrication systems used in practice. **[8]**

OR

Q: 10 (a) Explain the techniques for corrosion detection of machinery. **[8]**

(b) Explain atomic absorption spectrometric analysis. **[8]**

Q: 11 (a) Explain five steps in fault tree analysis. **[10]**

(b) Explain MTBF, MTTR, and MTTF. **[8]**

OR

Q: 12 Write short notes on: **[18]**

(i) Reliability centered maintenance

(ii) Failure mode and effect analysis.

(iii) Total productive maintenance

4364_78

B. E. (Production): 2003 Course: 411085

Elective I : Material Handling and Equipment Design

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

****

Instructions to the candidates:

1) **Answer *Three* questions from Section-I and *Three* questions from Section-II.**
2) **Answers to the two sections should be written in separate books.**
3) **Neat diagrams must be drawn whenever necessary.**
4) **Figures to the right indicate full marks.**
5) **Assume suitable data if necessary.**
6) **Use of electronic pocket calculator is allowed.**

****

SECTION-I

Q.1. (a) Explain systems approach to material handling. (8)

(b) Explain various factors to be considered during selection of material handling systems. (8)

OR

Q.2.(a)Explain 'Systematic Handling Analysis' (SHA) of material handling system. (8)

(b)Explain 'Unit load concept' of material handling system. (8)

Q.3.(a)Explain principles of material handling system. (8)

(b) What are the objectives of a good material handling system (8)

OR

Q.4.(a)Explain the following with neat sketch:

(i) Position restricted material handling system (8)

(ii) Line restricted material handling system (8)

Q.5.(a)Explain various types of cranes used for material handling with neat sketch (9)

(b)Describe the material handling system used for liquid and gas (9)

OR

Q.6. Write short note on (18)

(i)Roller conveyor and applications

(ii) Material handling systems in casting industry.

(iii)Types of pallets

SECTION-II

Q.7. (a) Explain advantages and disadvantages of automated material handling system. (8)

(b) Explain Robot assisted material handling. State the applications. (8)

OR

Q.8. (a) Describe various hydraulic and pneumatic systems used for Automated Material Handling. (8)

(b)Explain an automated system of material handling (case study) that is observed by you in any industry. (8)

Q.9.(a)Explain vehicle guidance technology by which AGV pathways are defined. (8)

(b)Explain two methods of traffic controls used in commercial AGV. (8)

OR

Q.10.(a)Explain different methods used for assigning AGVs to the task/ job (8)

(b) The length of an AS /RS is 400 ft and its height is 100 ft. Horizontal and vertical travel speeds are 250 ft/ min and 80 ft/ min, respectively. The P&D time = 0.6 min. Determine the single and dual command transaction times for the storage system (8)

Q.11.(a)Explain Safety aspects considerations in design and operation of material handling equipments. (9)

(b)Explain computer applications in material handling. (9)

OR

Q.12.Write short note on (18)

(i)RFID system

(ii)Environmental considerations in material handling

(iii) Packaging and its effect on selection of material handling.

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University of Pune
[4364]-79
BE Production Engineering
2003 Course

Materials and Financial Management

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) What is MPS? Explain relationship of MPS with MRP. 8
ii) What are the objectives of inventory control systems 8

OR

iii) What are the symptoms of poor inventory management? 8
iv) Explain need of inventories. 8

2)
i) Explain EOQ concept and its assumptions. 8
ii) Explain mathematical extension of basic EOQ model. 8

OR

iii) With the help of neat diagram explain inventory cost curve. 8
iv) What are different types of inventories? 8

3) Write a note on (any 3) 18
i) ABC analysis
ii) VED analysis
iii) Stock out cost

iv) Procurement cost
v) Rate of Return with respect to Inventories

SECTION – II

4)

i) Explain scope of financial management. 8
ii) Explain different financial goals. 8

OR

iii) Explain different financing functions. 8
iv) With the help of neat explain role of financial management in government sector. 8

5)

i) Compare IRR and NPV. 8
ii) What is profitability index? Explain with the help of neat example. 8

OR

iii) Explain capital rationing 8
iv) Explain different investment evaluation criterions. 8

6) Write a note on (any 3) 18

i) Cost of capital
ii) Payback period
iii) CAPM
iv) Cost of equity
v) Accounting rate

[Total No. of Questions: 12] **[Total No. of Printed Pages: 4]**

UNIVERSITY OF PUNE
[4364]-80
B. E. (Production Engineering) Examination - 2013
Process Planning And Tool Selection
(2003 Course)(411089)

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

Instructions:

1 *Answer 3 question from section I and 3 questions from section II*

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

3 *Black figures to the right indicate full marks.*

4 *Neat diagrams must be drawn wherever necessary.*

5 *Use of calculator and is allowed.*

6 *Assume suitable data, if necessary.*

SECTION -I

Q.1 A Explain the following terms: 8
i) Specification, ii) Part, iii) Assembly, iv) Work-piece v) Operation, vi) Equipment, vii) Tooling, viii) Routing.

B Process engineering is the hub of the organization. Explain. 8

OR

Q.2 A Explain the type of expertise that process engineer should have to discharge his duties in process planning. 8

B Draw and explain the diagram relating the operation classifications to the compete manufacturing sequence 8

Q. 3 A How many functional surface on the part may be identified? Why is originating operations important for process planner to plan the process? 8

B Explain the following terms: 8
i) Flaws, ii) Lay, iii) Datum, iv) Surface finish
Also differentiate between rectangular and angular dimensioning system.

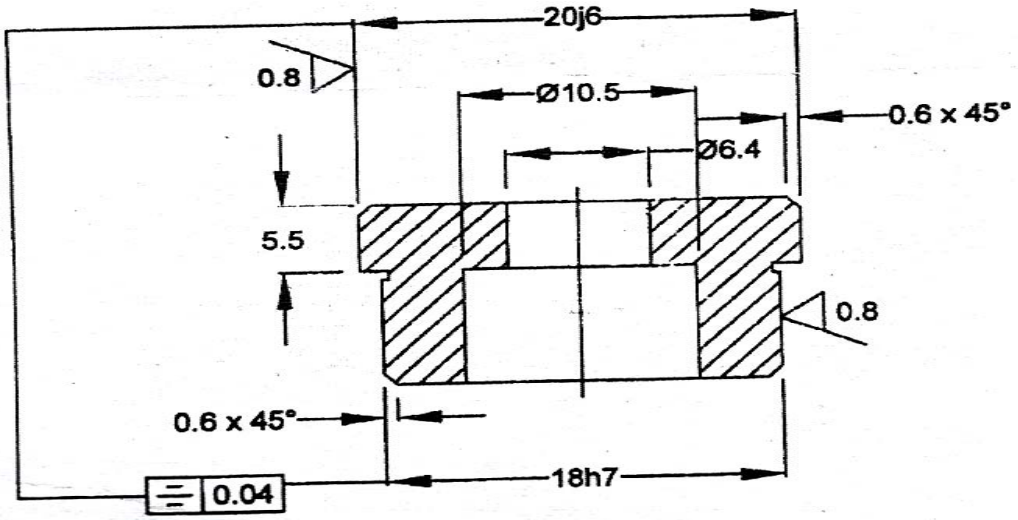
OR

Q. 4 A What are the three basic method of measurement of surface roughness explain in detail. 8

	B	Explain the purpose of grouping related surface or areas?	8
Q. 5	A	What is the purpose of tolerance chart?	6
	B	Define the following terms, i) Working dimensions, ii) unequal bilateral tolerance, iii) Basic size.	6
	C	What is a process tolerance stack? Explain with suitable example.	6
		OR	
Q. 6	A	Explain the rules for adding and subtracting the dimensions.	6
	B	Discuss the six possible movements of an object in the space.	6
	C	List the cause of work-piece variations.	6

SECTION II

Q. 7	A	Distinguish between general purpose machine (GPM) and special purpose machine (SPM).	8
	B	What is a tool inserts and how it is used? What are the benefits of using inserts over solid tools?	8
		OR	
Q. 8	A	What are the factors affecting machine selection? Explain.	8
	B	What are the main constraining factors on tool selection? What factors affects on tool performance?	8
Q. 9	A	Explain the following terms: i) Qualifying Operations, ii) Re-qualifying operations iii) Supporting operations iv) Auxiliary operations	8
	B	What are the advantages and limitations of computer Aided process planning? Name any four CAPP software's.	8
		OR	
Q. 10	A	Explain the difference between product critical areas and process critical areas with a sketch.	8
	B	What are steps in generative process planning system? Explain with a neat flow chart.	8
Q. 11	A	Fig. No1 shows the working drawing of "TENON" with the required dimensions and geometrical tolerance. Stock size is 25 x 15x 30 .The total quantity to be produced is 1000pcs. List the processes that you recommend to produce this part. Propose a process to machine the "TENON".	18



Title	Material	Qty	Scale	Tolerance
TENON	HCS	1000	2:1	±0.1

OR

Q. 12 A Prepare a process sheet for a component as shown in Fig. 2. Which is to be manufactured in batches of size 600.Analyse the part carefully and prepare the process sheet containing manufacturing plan with operation sequence, equipments, tooling, fixtures, process parameters and sample calculation of operation time. 18

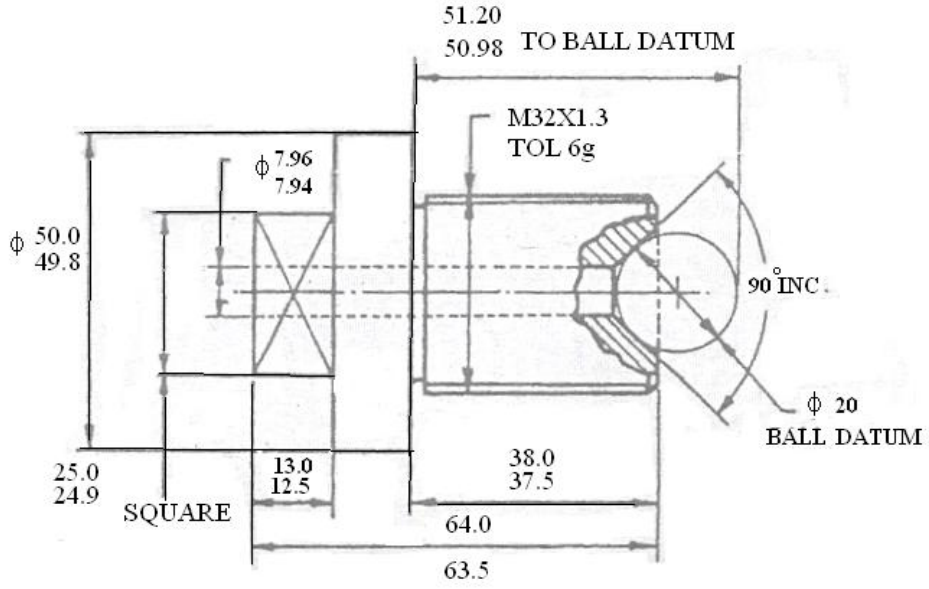


Fig. No. 2

Title	Material	Qty	Scale	Tolerance
SPINDLE	M.S.	600/Batch	1:1	±0.1

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

UNIVERSITY OF PUNE

[4364]-81

B. E. (*Production engg***) Examination - 2013**

CAD/CAM/CIM (2003 Course)

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

Instructions :

1 ***Answer One Question from Section I and Section II***

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

3 *Neat diagrams must be drawn wherever necessary.*

4 *Assume suitable data, if necessary.*

SECTION -I

Unit I

Q.1 A Consider A SQUARE ABCD having coordinates A(2,2), B(5,2), C(5,5), D(2,5).Determine the new position of SQUARE by following transformation-rotate by 30º anti clock wise about A, Scaling by 2 units in X and 1.5 in Y direction. 08

B Explain different operators used in modeling by Boundary representation. 08

OR

Q.2 A Explain the different Network topology in CAD/CAM. 08

B A line XY with end points X(2,2) and Y(5,5), find new co-ordinates of line for following transformation. 08

1. Translate X2 unit and Y4 unit
2. Scale in x and y direction by 1.5
3. Rotate by 50degree in CCW,
4. Reflection about origin

Unit II

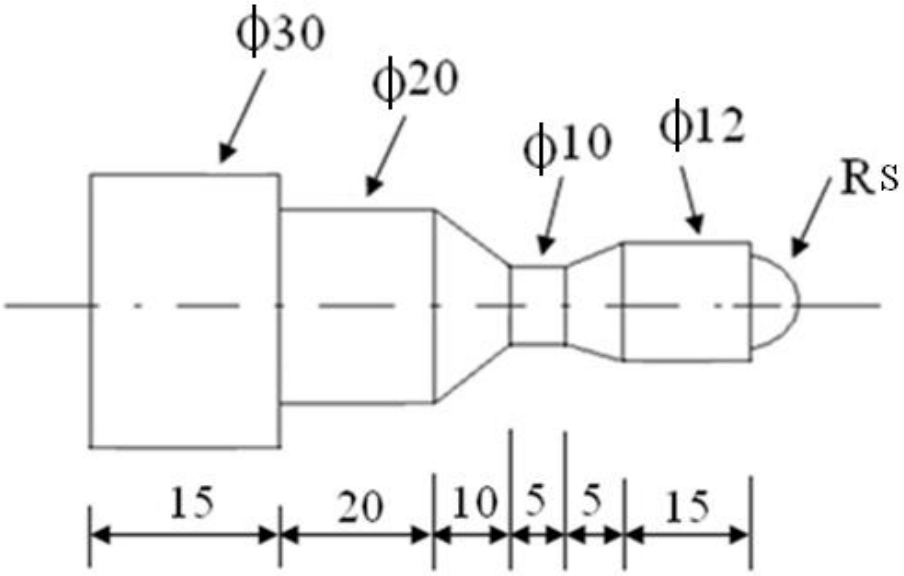
Q. 3 A Why tool presetting is required for CNC? Explain the set up with sketch. 06

B What is meant by flexibility in connection with FMS? Explain at least three types of flexibility that can be considered while designing FMS. 06

	C	Explain how accurate positioning control is obtained in NC?CNC machines	06

OR

Q. 4	A	Write a note on i. Automated factory ii. CANQ	08
	B	Write a CNC program in G and M code for a part as shown in fig No. 1. Also write a remark for each block.	10



Unit III

Q. 5	A	Explain different input and output reports of MRP-I	08
	B	Explain in brief the following in relation with robot programming. i. Manual method ii. Walk through method iii. Lead through method	08

OR

Q. 6	A	Explain different robot configuration	08
	B	Explain any two Engineering module in MRP-II	08

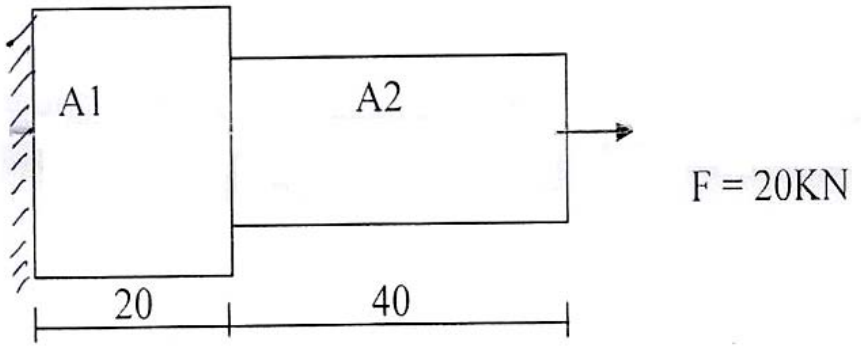
SECTION II

Unit IV

Q. 7	A	Why is RP used? Give the details of any one RP process.	08
	B	Explain with neat sketch steriolithography RP.	07
		OR	
Q. 8	A	Explain staircase effect in RP parts. How it will be minimized?	08
	B	Explain with neat sketch fused deposition RP. State its advantages, limitations.	07

Unit V

Q. 9	A	Explain concept of group technology.	08
	B	Explain different co-ordinate system used in FEA.	06
	C	Explain with suitable example the use of coding system in group technology.	06
		OR	
Q. 10	A	A stepped bar is made of two materials joined together as shown in following fig. No. 2. The bar is subjected to an axial pull of 20KN. Determine the displacement, reaction force at support, stress of each of the section using a ID spar element	14



$A1=75mm^2$, $E1=200GPa$ $A2=30mm^2$, $E2=120GPa$

	B	What is GSM? State its properties.	06

Unit VI

Q. 11	A	Explain with respective to IBM CIM mode i. Data and work flow integration ii. Enterprise optimization	08
	B	Explain the steps in sequential engineering	07
		OR	
Q. 12	A	Explain ESPRIT Model in brief	08
	B	Explain IBM concept of CIM	07

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

UNIVERSITY OF PUNE
[4364]-82
B.E. (Production Engineering) Examination - 2013
ROBOTICS
(Elective-II) (2003 Course)

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

Instructions:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 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) *Neat diagrams must be drawn wherever necessary.*

SECTION-I

Q.1 a) Explain with neat sketch anatomy of a robot. [10]

b) Find the worst spatial resolution of a spherical robot with 800 mm arm length. The robot is equipped with three encoders emitting 1400 pulses per revolution. The linear axis is actuated with the aid of 150 mm pitch lead screw having the encoder mounted on it. [06]

OR

Q.2 a) Explain with time period the development process in each robot generation. [10]

b) Define Robot State the laws of Robotics. [06]

Q.3 a) For a pick and place type of robot, the link parameters table is given below: [08]

i	α_{i-1}	a_{i-1}	d_i	θ_i
1	0	90^0	0	30^0
2	30^0	0	-2	0^0
3	0	5	0	90^0

Determine the location of the end point of the link 3 with respect to the base.

b) Explain with neat diagram the joint notations used to designate robot joints. [08]

OR

Q.4 a) For a pick and place of robot, the link parameters table is given below: [08]

i	α_{i-1}	a_{i-1}	d_i	θ_i
1	30^0	0	0	45^0
2	-90^0	2	-0	-45^0
3	0	0	0	60^0

Determine the location of the end point of the link 3 with respect to the base.

b) Explain the concept of Inverse kinematics. [08]

Q.5 a) Explain with neat diagram, proximity and range sensor used in robot. [08]
b) Write a note on Robot vision. [10]

OR

Q.6 a) What are the considerations for the design and selection of grippers. [08]
b) The following data represent a 8X8 array of pixel. Each element in array indicates the gray level of pixel. [10]

10	17	19	17	19	17	19	12
13	17	19	18	19	19	18	13
14	15	11	19	19	15	10	14
13	10	11	20	20	11	11	13
12	12	12	20	21	12	11	12
11	12	12	19	19	12	10	12
12	18	18	18	19	18	20	11
12	19	19	18	19	20	22	12

Convert t into black and white image.

SECTION-II

Q.7 a) Explain the programming methods used in robots. [08]
b) How intelligence can be incorporated in robots. [08]

OR

Q.8 a) Explain 'WAIT', 'DELAY', 'SIGNAL', 'DEPART' commands. [08]
b) Describe the structure of any robot programming language with example. [08]

Q.9 a) Explain the working of Rs 232 interface. [08]
b) Describe the following applications of robot: [08]
i) Underwater robot.
(ii) Machine loading and unloading

OR

Q.10 a) What is handshaking? Explain hardware handshaking of robot. [08]
b) What do you understand from robot economics? [08]

Q.11 Write a note on: [18]
i) Walking robots
(ii) Safety measures in robotics

OR

Q.12 Write a note on: [18]
i) Distance controlled robots
(ii) Robots used in mines

(4364)-83
B.E. (Production)
Examination May 2013
(2003 Pattern)
Ergonomics And Human Factors Engineering

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

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

Instructions:

(1) Answers 03 question from section-I & 03 from Section-II
(2) Figures to the right indicate full marks.
(3) Neat diagrams must be drawn whenever necessary.
(4) Assume suitable data, if necessary.

Section I

Q1. A) What are the objectives of human factors engineering? [8]
B) Explain design of Manual Materials handling task. [10]

OR

Q2. A) Explain the basis for ergonomic problem identification. [9]

B) What is biomechanics? Elaborate with a practical example. [9]

Q3. A) What is anthropometry? Explain the principles in the application of its data [10]
B) Explain any two principles of arrangements of components in various working conditions. [6]

OR

Q4. A) Explain the consideration in the design of a seated workplace. [10]
B) What are the requirements for designing a safe product? [6]

OR

Q5. Explain the arrangement of any four of the following components at workplace [16]

1. Visual Displays
2. Control Panels
3. Hand Controls
4. Multifunction Hand controls
5. Mirror hand arrangements
6. Data applies in arrangement of components in physical space

OR

Q6. A) Discuss the concept of visibility. How is it related with elderly people? [8]

B) What do you mean by vibration Syndrome? How is it critical in hand tool design? [8]

SECTION II

Q7. A) Explain any three temperature indices and its relativity with each other. [12]

B) Write a note on glare and its importance in illumination. [6]

OR

Q8. A) Explain any two effects heat on human performance [8]

B) Discuss the techniques of noise reduction. [10]

Q9. A) Explain the work and rest cycle in accordance with Human Factors Engineering [8]

B) Discuss the role of learning curves for application in ergonomics. [8]

OR

Q10. Explain any three important phases in application of ergonomics in systems Design [16]

Q11. What is work factor System? How is it important to study its component for Human Factors Engineer? Discuss its types in brief [16]

OR

Q12. A) Explain the reach element in MTM 1. What are its classes? [8]

B) How is PMTS got evolved from traditional concepts of work study? Discuss its importance from a perspective of industrial engineer. [8]

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

UNIVERSITY OF PUNE
[4364]-85
B. E. (PRODUCTION ENGINEERING) Examination 2013
ADVANCED PRODUCTION TECHNOLOGY
ELETIVE-II (411090)
(2003 Course)

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

Instructions:

(1) *Answer any three questions from Section I and any three questions from Section II*
(2) *Answers to the two Sections should be written in separate answer-books*
(3) *Neat diagram must be drawn wherever necessary.*

SECTION I

UNIT-I

Q.1 A) Explain the basic frame work of TPS [8]
b) Explain the various KANBAN Rules with their subrules [8]

OR

Q.2 A) Explain the concept of automation in TPS [8]
B) Illustrate a JIT system with the help of neat block diagram [8]

UNIT –II

Q.3 A) What is value stream mapping and explain its importance in industry. [8]
B) What is reverse engineering? Compare it with Business process reengineering. [9]

OR

Q.4 A) Explain with neat sketch various activities involved in SMED [9]
B) What is performance of manufacturing? state which data has to be collected and report to be prepared for measuring performance of manufacturing. [8]

UNIT-III

Q.5 A) Describe the various hard and soft factors of the organisation for productivity improvement [8]
B) What is productivity? Explain different types of productivity and its measurement in manufacturing industry. [9]

OR

Q.6 A) Describe the various factors for productivity improvement in small scale industries [9]

B) What is MBO? Explain steps in MBO. [8]

SECTION-II

UNIT-IV

Q.7 A) Explain the concept of simulation in manufacturing industry? [9]

B) Explain how data collection will be done in expert system [8]

OR

Q.8 A) What is Artificial Intelligence? Explain its applicability in manufacturing [8]

B) Explain to create a logical rule for decision making in AI? [9]

UNIT V

Q.9 A) explain methodology for system design in manufacturing? [8]

B) What meant by the design synthesis and functional analysis in design [8]

OR

Q.10 A) Explain with suitable example the importance of tolerance analysis in product design. [8]

B) What is feasibility analysis? Explain why it is carried out [8]

UNIT VI

Q.11 A) What is innovation? Explain its importance for surviving the industry with suitable example [9]

B) Explain the role of government in technology development [8]

OR

Q.12 A) Explain the impact of technology on society and business. [9]

s B) Explain in detail the evolution of technology management [8]