

16/11/13

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**B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013**

**MANUFACTURING ENGINEERING**

VII Semester

**MF 9401 Operation Research**

(Regulation R 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. List any four major assumptions made in LPP.
2. What is the purpose of carrying out sensitivity analysis?
3. How is the effect of degeneracy considered in transportation problems?
4. Explain the significance of Total Float in project network models.
5. Define: Re-Order point in inventory models.
6. Bring out any two major differences between purchase and production model inventories.
7. What do you mean by renegeing? Will it influence on arrival rate?
8. Discuss on Poisson distribution.
9. Explain – Maximin concept.
10. List the factors to be considered in Replacement Models.

**Part – B ( 5 x 16 = 80 marks)**

11. i) A business executive has the option to invest money in two plans: Plan A guarantees that each dollar invested will earn \$0.70 a year later, and plan B guarantees that each dollar invested will earn \$2 after 2 years. In plan A, investments can be made annually, and in plan B, investments are allowed for periods that are multiples of 2 years only. (12)
  - a) How should the executive invest \$100,000 to maximize the earnings at the end of 3 years?
  - b) Is it worthwhile for the executive to invest more money in the plans?
- ii) Prove: Dual of the Dual is PRIMAL. (4)

12. a) i) Find the optimal transportation for the following problem : (10)

	W1	W2	W3	W4	
F1	12	9	15	10	100
F2	7	11	14	21	175
F3	16	13	18	10	125
	50	150	130	170	

- ii) Consider the following assignment model and find the optimal solution: (6)

	1	2	3	4
A	19	15	16	24
B	18	32	19	28
C	13	17	21	25
D	9	15	24	29
E	13	28	16	20

(OR)

- b) i) The activities in the following table describe the construction of a new house. Develop the associated project network and find the critical path. (EST, EFT, LST, LFT AND TF not required) (6)

Activity	Predecessor(s)	Duration (Days)
A: Clear site	-	1
B: Bring utilities to site	-	2
C: Excavate	A	1
D: Pour foundation	C	2
E: Outside plumbing	B, C	6
F: Frame house	D	10
G: Do electric wiring	F	3
H: Lay floor	G	1
I: Lay roof	F	1
J: Inside plumbing	E, H	5
K: Shingling	I	2
L: Outside sheathing insulation	F, J	1
M: Install windows and outside doors	F	2
N: Do brick work	L, M	4
O: Insulate walls and ceiling	G, J	2
P: Cover walls and ceiling	O	2
Q: Insulate roof	I, P	1
R: Finish interior	P	7
S: Finish exterior	I, N	7
T: Landscape	S	3

Chip thickness ratio : 0.3

Horizontal component of the cutting force = 1290 N

Vertical component of the cutting force = 1650 N

From Merchant's theory, calculate the various components of the cutting forces and the coefficient of friction at then chip tool interface. (8)

(Or)

12 b i) Enumerate with neat sketch, measurement of cutting temperature using work-tool thermocouple method. (8)

ii) Discuss various mechanisms of tool wear. (8)

13 a i) Describe with neat sketch cutting external thread on a lathe. (8)

ii) List out various operations carried out on drilling machine. Explain any four. (8)

(Or)

13 b i) Describe various types of multi spindle automats. (8)

ii) Distinguish between ram type turret lathe and saddle type turret. (8)

14 a i) Describe with neat sketches various types of surface grinding machines. (8)

ii) List out various types of bond materials used in grinding wheel. Explain any three. (8)

(Or)

14 b i) Write short notes on

i) grinding fluids (5)

ii) gear finishing operations (5)

iii) economics of grinding (6)

15a i) Describe with neat sketch the principle of electron beam machining process. (8)

ii) Enumerate with neat sketch the principle of ultrasonic machining process. (8)

(Or)

15 b) Write short notes

i) high speed machining (5)

ii) ultra precision machining (5)

iii) hard turning (6)