

2005 SBM OPERATIONS MANAGEMENT Test 2

Time: 50 minutes

Max marks: 25

- What do you mean by economies and diseconomies of scale? What are the reasons for this? (3 marks)
- On Monday morning at 9:00 hrs, Ramgopal, the owner of Horizon tailors, has estimated the time required for completing various orders as follows:

Customer	Time required (hrs)	Due Time (hrs)
Jack	3	11:00
Jill	1.5	14:00
James	2	12:00
Jancy	1	16:00
John	2.5	20:00

Determine the order in which the jobs should be taken up according to SPT rule. Calculate the average hours early, and average WIP inventory if jobs are scheduled according to this rule.

(5 marks)

- Explain the significance of input output control in Job shop scheduling. (3 marks)
- The major activities and precedence relationships to shoot the pilot episode of a film serial are as follows:

	Activity	Predecessor	Time (weeks)
A	Decide story	-	1
B	Select director	A	1
C	Select script writer	B	1
D	Select actors	B	3
E	Select location	B	2
F	Select photographer	A	2
G	Write script	C	3
H	Shoot episode	D, E, F, G	4
I	Edit and Dub	H	2

Draw the network diagram and determine the earliest week that the pilot episode can be completed.

(5 marks)

- The unit cost and annual usage for various items in an office are given in table below. Divide the items into ABC classes.

Item	Unit Cost (Rs)	Annual Usage
Paper	0.1	1000
Pens	10	25
Pencil	4	10
Stapler	50	1
Stapler pin	10	3

Item	Unit Cost (Rs)	Annual Usage
Paper clips	10	2
Pins	5	5
Files	10	50
Registers	50	6
Eraser	2	5

(3 marks)

- Crancho makes electrical switches each of which consists of a base, key, lever, spring and two screws. The latest MPS calls for 2000 Nos in week 4 and 1000 Nos in week 5 and the lead time for final assembly is one week. Determine the planned order release quantities and weeks **only for Screw**, if its POQ=2 weeks, beginning inventory 600 Nos, Lead Time 2 weeks and there is an already scheduled receipt of 1200 in week 3. (5 marks)
- Explain the effect of JIT system on the Workforce. (2 marks)
- What do you mean by the socio-technical approach to job design? (2 marks)
- A worker has produced 500 pieces in one day. The standard production rate is 30 pieces an hour. Determine the wages for the work according to a 50% gain-sharing plan, if the wage rate is Rs 30 an hour. Assume eight work hours in a day. (2 marks)

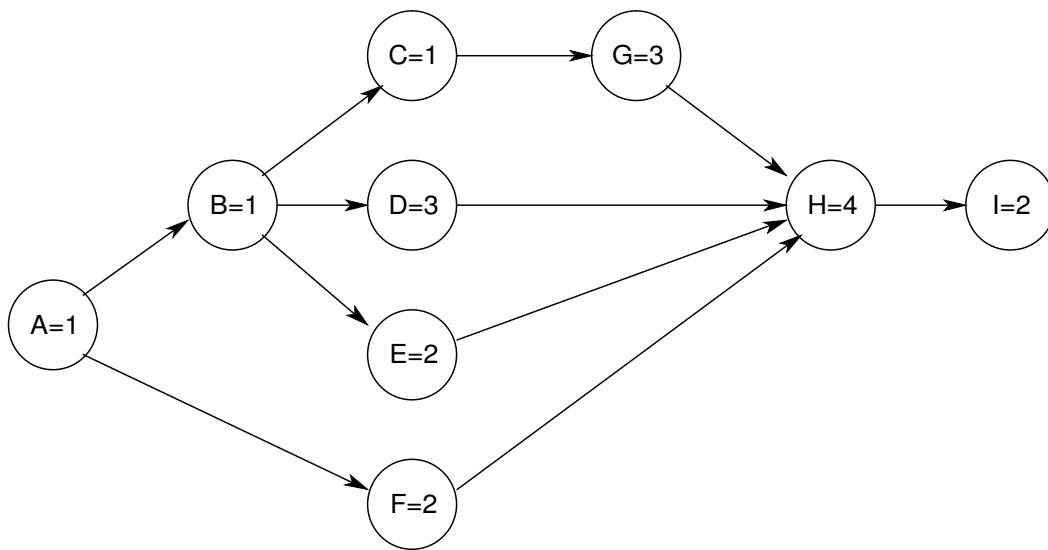
(2 marks)

SOLUTIONS TO PROBLEMS:

2.

Job sequence	Begin Work	Processing Time	Completion Time	Job Flow Time	Scheduled customer pickup time	Actual customer pickup time	Hours early	Hours past due
Jancy	9	1	10	1	16	16	6	0
Jill	10	1.5	11.5	2.5	14	14	2.5	0
James	11.5	2	13.5	4.5	12	13.5	0	1.5
John	13.5	2.5	16	7	20	20	4	0
Jack	16	3	19	10	11	19	0	8
				25			12.5	
Average WIP Inventory				2.5	Average hours early		2.5	

4.



Critical Path ABCGHI=12 weeks

5.

Item	Unit Cost (Rs)	Annual Usage	Inventory Value	%	Category
Files	10	50	500	37.74	A
Registers	50	6	300	22.64	A
Pens	10	25	250	18.87	B
Paper	0.1	1000	100	7.55	B
Stapler	50	1	50	3.77	B
Pencil	4	10	40	3.02	C
Stapler pin	10	3	30	2.26	C
Pins	5	5	25	1.89	C
Paper clips	10	2	20	1.51	C
Eraser	2	5	10	0.75	C
			1325	100	

6.

Item: Screw	Lot size: POQ 2 weeks							
	Lead Time: 2 weeks							
	Week							
	1	2	3	4	5	6	7	8
Gross requirements			4000	2000				
Scheduled receipts			1200					
Projected on-hand inventory (Beg: 600)	600	600	2000	0				
Planned receipts			4200					
Planned Order release	4200							

9. Credited hours = $500/30 = 16.67$ hrs. First 8 hrs * 30 = Rs240. Balance 8.67 hrs * $30/2 =$ Rs130. Hence total wage = Rs370