OPERATIONS RESEARCH WINSEM 2020-2021 **SLOT: C1**

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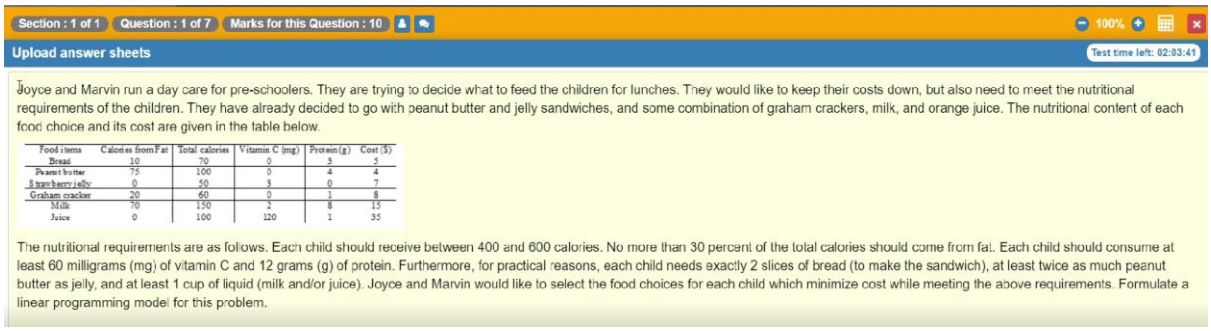
From: VIT Question Papers (Telegram)

Q1.



Food items	Calories from Fat	Total calories	Vitamin C (mg)	Protein (g)	Cost ($)
Bread	10	70	0	3	5
Peanut butter	75	100	0	4	4
Strawberry jelly	0	50	3	0	7
Graham cracker	20	60	0	1	8
Milk	70	150	2	8	15
Juice	0	100	120	1	35

Q2.

A tin box company has four factories that supply to 5 warehouses. The variable cost of manufacturing and shipment of one ton of product from each factory to each warehouse are shown in the matrix given below, Factory capacities and warehouse requirements are shown in the margin. After several iterations the solution obtained is also shown.

Warehouses (Cost in Rs. per unit)

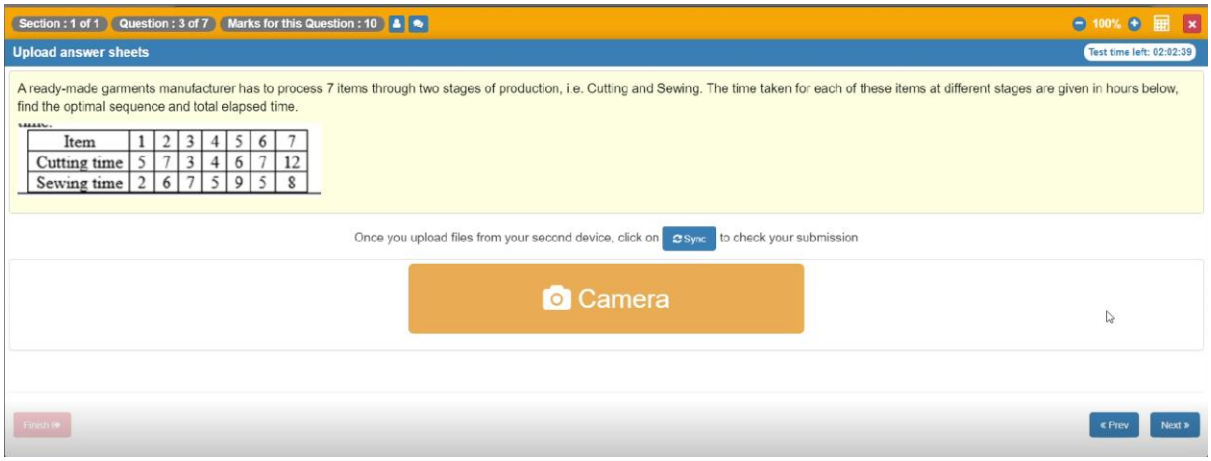
Factories	A	B	C	D	E	DMY	Capacity
W	17	9	14 **25**	10 **30**	14	0 **20**	75
X	13 **10**	6 **20**	11 **15**	11	12	0	45
Y	6 **30**	17	9	12	12	0	30
Z	15	20	11 **10**	14	6 **40**	0	50
Req	40	20	50	30	40	20	200

Is this an optimal solution? How do you know?

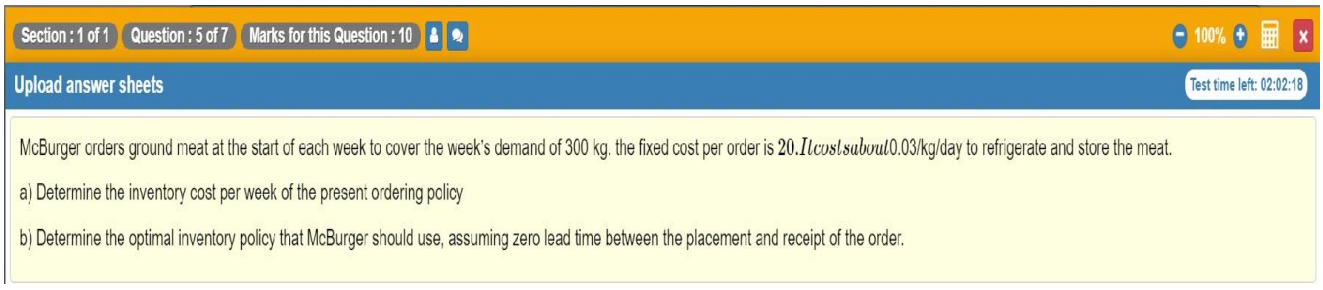
Warehouses (Cost in Rs. per unit)

Factories	A	B	C	D	E	DMY	Capacity
W	17	9	14 **25**	10 **30**	14	0 **20**	75
X	13 **10**	6 **20**	11 **15**	11	12	0	45
Y	6 **30**	17	9	12	12	0	30
Z	15	20	11 **10**	14	6 **40**	0	50
Req	40	20	50	30	40	20	200

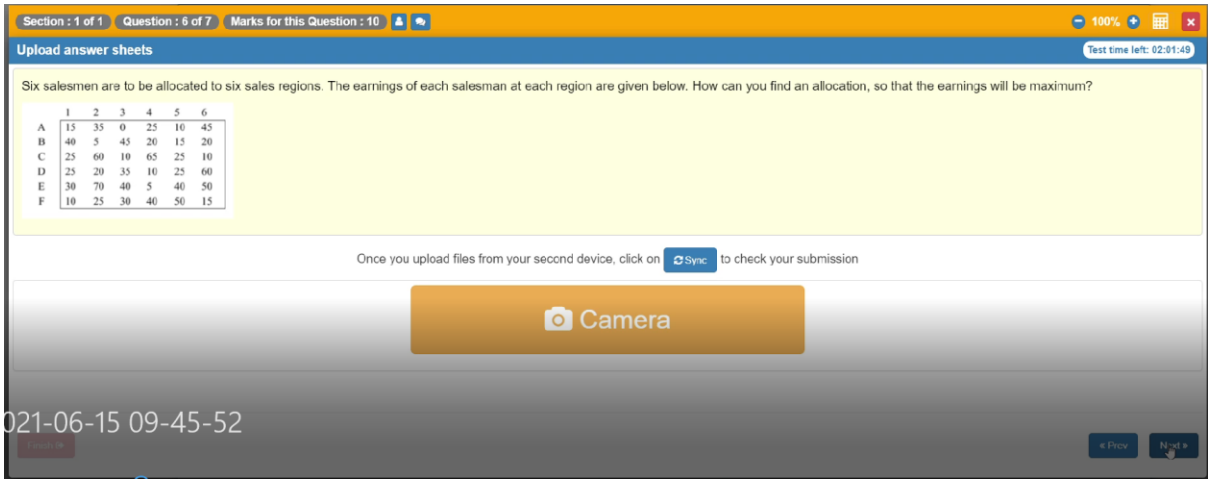
Q.3



Q5.

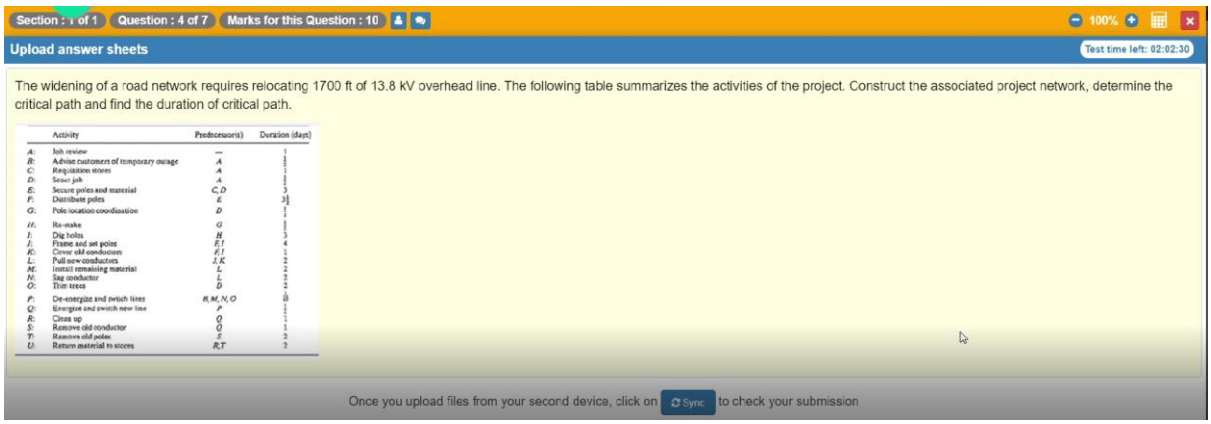


Q6.



	1	2	3	4	5	6
A	15	35	0	25	10	45
B	40	5	45	20	15	20
C	25	60	10	65	25	10
D	25	20	35	10	25	60
E	30	70	40	5	40	50
F	10	25	30	40	50	15

Q4.



	Activity	Predecessor(s)	Duration (days)
A:	Job review	—	1
B:	Advise customers of temporary outage	A	$\frac{1}{2}$
C:	Requisition stores	A	1
D:	Scout job	A	$\frac{1}{2}$
E:	Secure poles and material	C, D	3
F:	Distribute poles	E	$3\frac{1}{2}$
G:	Pole location coordination	D	$\frac{1}{2}$
H:	Re-stake	G	$\frac{1}{2}$
I:	Dig holes	H	3
J:	Frame and set poles	F, I	4
K:	Cover old conductors	F, I	1
L:	Pull new conductors	J, K	2
M:	Install remaining material	L	2
N:	Sag conductor	L	2
O:	Trim trees	D	2
P:	De-energize and switch lines	B, M, N, O	$\frac{1}{15}$
Q:	Energize and switch new line	P	$\frac{1}{15}$
R:	Clean up	Q	1
S:	Remove old conductor	Q	1
T:	Remove old poles	S	2
U:	Return material to stores	R, T	2

Q7.