Gestion Industrielle – DS

NOTATION:

Good response: **1 point**. If there are multiple selections in the response, each one represents a part as a prorate between all. (Ex. 3 selections good, each selection represents 1:3. But if there are 4 selections instead of 3, each selection represents 1:4 and only good responses give points.)

Bad response or **no response**: **0 point**

Documents needed for calculation into exercises are at the end of the subject.

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1. A company doesn't need to make forecasting because the best way is to produce exactly what customers want to buy.

A	B
True	False

2. Medium term forecasting is done for managing manufacturing and supply capacity. What is the common delay?

A	B	C	D	E
Less than 1 month	More than 3 years	Between 1 and 6 months	Between 6 months and 2 years	None

3. Considering information below, choose the good safety stock:

A company have sale a product during last year and quantity sale by month are:

Month	Qty
January	180
February	75
March	90
April	110
May	150
June	120
July	165
August	80
September	140
October	115
November	100
December	130

The standard variation for the complete year is 33.11 products and the company want to guarantee a satisfaction service rate of 98.75%.

A	B	C	D	E
SS=65	SS=54	SS=75	SS=74	None

4. Considering information below, choose the good safety stock:

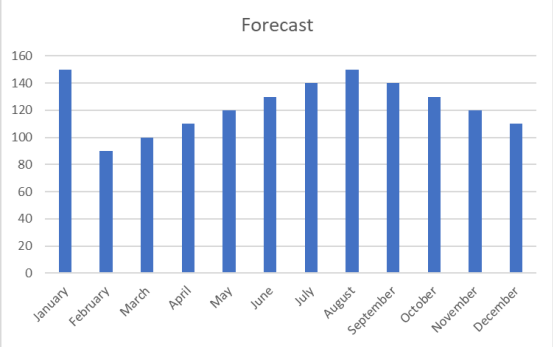
The company have defined the forecast for this year for the same product:

Month	Forecast	Errors
January	150	30
February	90	-15
March	100	-10
April	110	0
May	120	30
June	130	-10
July	140	25
August	150	-70
September	140	0
October	130	-15
November	120	-20
December	110	20

The standard variation for the complete year for the forecast is 19.29 products and for errors is 28.08 products. The company wants this time to guarantee a satisfaction service rate of 98.9%.

A	B	C	D	E
SS=65	SS=54	SS=75	SS=74	None

5. Considering the graph below, what type of profile the forecast seems to be?



A	B	C	D	E
Consistent	Trendy	Seasonal	Trendy and Seasonal	None

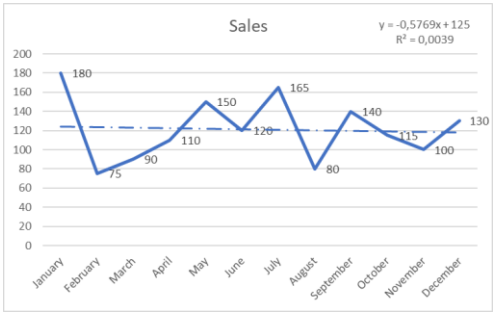
6. How many methodologies are generally used to make forecast?

A	B	C	D	E
1	2	3	4	None

7. Which methodology is used for medium and long term analysis?

A	B	C	D	E
Qualitative	Moving averages	Quantitative	By decomposition	None

8. Using the method by decomposition and the sales from the question 3 represented by the graph below, what is the seasonality per quarter?



Quarter	Monthly Average
1st	115,00
2nd	91,67
3rd	116,67
4th	126,67
Global Average	121,25

A	B	C	D	E
94,8%	95%	94%	95%	None
75,6%	76%	75%	76%	
96,2%	97%	96%	96%	
104,5%	104%	104%	104%	

9. On the previous graph, what does R^2 signify?

A	B	C	D
0.39% of the variability can be explain by seasonal variations or random characters	99.61% are explained by the trend	0.39% of the variability can be explain by the trend	99.61% are explained by seasonal variations or random characters

10. Considering seasonality and elements from question 3 to 9, what are forecasts calculated with method by duplication for next year?

For example, forecasts corrected for this year are:

Month	n	Forecast	Tn=-0,5769n+125	Sn	Pn=Tn.Sn
January	1	150	124	94,8%	118
February	2	90	124	94,8%	117
March	3	100	123	94,8%	117
April	4	110	123	75,6%	93
May	5	120	122	75,6%	92
June	6	130	122	75,6%	92
July	7	140	121	96,2%	116
August	8	150	120	96,2%	116
September	9	140	120	96,2%	115
October	10	130	119	104,5%	125
November	11	120	119	104,5%	124
December	12	110	118	104,5%	123

A		B		C		D		E
January	126	January	126	January	126	January	111	None
February	126	February	126	February	126	February	111	
March	127	March	127	March	127	March	110	
April	88	April	102	April	101	April	88	
May	87	May	102	May	102	May	87	
June	87	June	103	June	102	June	87	
July	110	July	131	July	131	July	110	
August	109	August	131	August	131	August	109	
September	109	September	132	September	132	September	109	
October	143	October	143	October	144	October	117	
November	144	November	144	November	144	November	117	
December	145	December	144	December	145	December	116	

11. Considering the moving averages methodology and that seasonality is based on quarter, so 3 months, what are forecasts for the first 3 months of this year?

A		B		C		D		E
Month	Forecast	Month	Forecast	Month	Forecast	Month	Forecast	None
January	113	January	95	January	115	January	103	
February	100	February	92	February	92	February	120	
March	110	March	102	March	117	March	137	

12. Which of the following best describe the Sales and Operations Planning?

A	B	C	D	E
It's the high level plan for managing resources of the factory	It's generally reviewed in a weekly meeting with the management board and operations managers	It's composed of sales forecasts for product families	The commercial department is responsible of the sales and manufacturing forecasts	None

13. Considering the SOP below, what is the value of the Stock Performance?

Family: **A** Unit: **k€** Date: **January, 2nd**

Sales	M-3	M-2	M-1	M	M+1	M+2	M+3	M+4
	October	November	December	January	February	March	April	May
Forecast	130	120	110	111	111	110	88	87
Real	115	100	130					
Difference	-15	-20	20					
Difference in %	-13%	-20%	15%					

Production	M-3	M-2	M-1	M	M+1	M+2	M+3	M+4
	October	November	December	January	February	March	April	May
Forecast	120	120	120	120	118	110	90	90
Real	110	115	118					
Difference	-10	-5	-2					
Difference in %	-9%	-4%	-2%					

Stocks	M-3	M-2	M-1	M	M+1	M+2	M+3	M+4
	October	November	December	January	February	March	April	May
Forecast	50	50	50	40	40	43	50	50
Real	55	70	52					
Difference	5	20						
Difference in %	9%	29%						

	75
Stock target:	50
	25

A	B	C	D	E
2%	4%	83%	96%	None

14. In MRP2, what is the order of different tools for planification from the general one to the most detailed?

A	B	C	D
- Sales and Operations Planning - Master Planning - Strategy Plan - Requirements Calculation - Workshop Management	- Strategy Plan - Sales and Operations Planning - Master Planning - Requirements Calculation - Workshop Management	- Workshop Management - Requirements Calculation - Strategy Plan - Sales and Operations Planning - Master Planning	- Strategy Plan - Requirements Calculation - Sales and Operations Planning - Master Planning - Workshop Management

15. For Joseph Orlicky, independents needs can be estimate by forecasts and dependents needs must be calculated.

A	B
True	False

16. Independents needs come from inside the company.

A	B
True	False

17. The Master Planning is used as input to calculate the Net Requirements Calculation.

A	B
True	False

18. Which of the followings is the formula of the Net Requirements?

A	B	C	D	E
$NR_p = GR_p + FS_{p-1} + OL_p$	$NR_p = FS_{p-1} - GR_p - OL_p$	$NR_p = OL_p - FS_{p-1} - GR_p$	$NR_p = GR_p - FS_{p-1} - OL_p$	None

19. With a BOM of several levels of components, with must take care of the requirements coming from all levels of materials.

A	B
True	False

20. Which of the followings types of orders are used for the Net Requirements calculation?

A	B	C	D	E
Firm Orders	Launched Orders	Proposed Orders	Sales Orders	None

21. To resolve a negative level of forecast stock after a Net Requirements calculation, the manufacturing order should be rescheduled earlier.

A	B
True	False

22. Which of the followings are true?

A	B	C	D	E
In case of variability in waste materials, it could be a good solution to manage a safety stock	A company that manage stock must use a safety stock for a good Net Requirements calculation	A safety stock helps to prevent any collision between operators in the factory	A safety stock must be considered as a positive net requirement	None

23. Which of the followings theories is used to identify the capacity of a workstation?

A	B	C	D	E
The quantum theory	The queuing theory	The big bang theory	The endosymbiotic theory	None

24. Which of the following formulas represent the capacity used rate of a system?

A	B	C	D	E
$\partial = \frac{a}{CT}$	$\partial = \frac{a}{b}$	$\partial = \frac{a}{b} \times CT$	$\partial = a \times CT$	None

25. Which of the following formulas represent the average number of pieces in progress?

A	B	C	D	E
$WIP = \frac{\partial}{1+a}$	$WIP = \frac{\partial}{1-b}$	$WIP = \frac{\partial}{a-b}$	$WIP = \frac{\partial}{b-a}$	None

26. Which of the following formulas represent the average waiting time?

A	B	C	D	E
$AWT = \frac{1}{b} \times \frac{\partial}{1+a}$	$AWT = CT \times \frac{\partial}{1-a}$	$AWT = CT \times WIP$	$AWT = \frac{\partial}{LT}$	None

27. Which of the following formulas represent the Lead Time?

A	B	C	D	E
$LT = \frac{1}{b-a}$	$LT = \frac{\partial}{1-CT}$	$LT = \frac{a}{WIP}$	$LT = \frac{CT}{1-\partial}$	None

28. In Just In Time production, it's not recommended to overload the system to decrease the cycle time.

A	B
True	False

29. How many typical documents are used in production?

A	B	C	D
2	3	4	5

30. Which of the following documents are used in production?

A	B	C	D	E
Manufacturing order	Good card	Following issue	Work Order	None

Normal distribution table

k	0	0,01	0,02	0,03	0,04	0,05	0,06	0,07	0,08	0,09
0,0	0,5000	0,5040	0,5080	0,5120	0,5160	0,5199	0,5239	0,5279	0,5319	0,5359
0,1	0,5398	0,5438	0,5478	0,5517	0,5557	0,5596	0,5636	0,5675	0,5714	0,5753
0,2	0,5793	0,5832	0,5871	0,5910	0,5948	0,5987	0,6026	0,6064	0,6103	0,6141
0,3	0,6179	0,6217	0,6255	0,6293	0,6331	0,6368	0,6406	0,6443	0,6480	0,6517
0,4	0,6554	0,6591	0,6628	0,6664	0,6700	0,6736	0,6772	0,6808	0,6844	0,6879
0,5	0,6915	0,6950	0,6985	0,7019	0,7054	0,7088	0,7123	0,7157	0,7190	0,7224
0,6	0,7257	0,7291	0,7324	0,7357	0,7389	0,7422	0,7454	0,7486	0,7517	0,7549
0,7	0,7580	0,7611	0,7642	0,7673	0,7704	0,7734	0,7764	0,7794	0,7823	0,7852
0,8	0,7881	0,7910	0,7939	0,7967	0,7995	0,8023	0,8051	0,8078	0,8106	0,8133
0,9	0,8159	0,8186	0,8212	0,8238	0,8264	0,8289	0,8315	0,8340	0,8365	0,8389
1,0	0,8413	0,8438	0,8461	0,8485	0,8508	0,8531	0,8554	0,8577	0,8599	0,8621
1,1	0,8643	0,8665	0,8686	0,8708	0,8729	0,8749	0,8770	0,8790	0,8810	0,8830
1,2	0,8849	0,8869	0,8888	0,8907	0,8925	0,8944	0,8962	0,8980	0,8997	0,9015
1,3	0,9032	0,9049	0,9066	0,9082	0,9099	0,9115	0,9131	0,9147	0,9162	0,9177
1,4	0,9192	0,9207	0,9222	0,9236	0,9251	0,9265	0,9279	0,9292	0,9306	0,9319
1,5	0,9332	0,9345	0,9357	0,9370	0,9382	0,9394	0,9406	0,9418	0,9429	0,9441
1,6	0,9452	0,9463	0,9474	0,9484	0,9495	0,9505	0,9515	0,9525	0,9535	0,9545
1,7	0,9554	0,9564	0,9573	0,9582	0,9591	0,9599	0,9608	0,9616	0,9625	0,9633
1,8	0,9641	0,9649	0,9656	0,9664	0,9671	0,9678	0,9686	0,9693	0,9699	0,9706
1,9	0,9713	0,9719	0,9726	0,9732	0,9738	0,9744	0,9750	0,9756	0,9761	0,9767
2,0	0,9772	0,9778	0,9783	0,9788	0,9793	0,9798	0,9803	0,9808	0,9812	0,9817
2,1	0,9821	0,9826	0,9830	0,9834	0,9838	0,9842	0,9846	0,9850	0,9854	0,9857
2,2	0,9861	0,9864	0,9868	0,9871	0,9875	0,9878	0,9881	0,9884	0,9887	0,9890
2,3	0,9893	0,9896	0,9898	0,9901	0,9904	0,9906	0,9909	0,9911	0,9913	0,9916
2,4	0,9918	0,9920	0,9922	0,9925	0,9927	0,9929	0,9931	0,9932	0,9934	0,9936
2,5	0,9938	0,9940	0,9941	0,9943	0,9945	0,9946	0,9948	0,9949	0,9951	0,9952
2,6	0,9953	0,9955	0,9956	0,9957	0,9959	0,9960	0,9961	0,9962	0,9963	0,9964
2,7	0,9965	0,9966	0,9967	0,9968	0,9969	0,9970	0,9971	0,9972	0,9973	0,9974
2,8	0,9974	0,9975	0,9976	0,9977	0,9977	0,9978	0,9979	0,9979	0,9980	0,9981
2,9	0,9981	0,9982	0,9982	0,9983	0,9984	0,9984	0,9985	0,9985	0,9986	0,9986
3,0	0,9987	0,9987	0,9987	0,9988	0,9988	0,9989	0,9989	0,9989	0,9990	0,9990
3,1	0,9990	0,9991	0,9991	0,9991	0,9992	0,9992	0,9992	0,9992	0,9993	0,9993
3,2	0,9993	0,9993	0,9994	0,9994	0,9994	0,9994	0,9994	0,9995	0,9995	0,9995
3,3	0,9995	0,9995	0,9995	0,9996	0,9996	0,9996	0,9996	0,9996	0,9996	0,9997
3,4	0,9997	0,9997	0,9997	0,9997	0,9997	0,9997	0,9997	0,9997	0,9997	0,9998
3,5	0,9998	0,9998	0,9998	0,9998	0,9998	0,9998	0,9998	0,9998	0,9998	0,9998