Subject A

Teacher(s):	NOURRISSON
Head of department:	NOURRISSON
Module:	Prevision & Planification
Promotion:	2025
Date of the exam:	18/12/2023
Time of the exam:	11h30
Duration of the exam:	1h30

- Exam organisation for people with disabilities:

1 hour + extra time (one third)	~~1h30; adapted subject~~	~~not concerned~~

- Authorised material:

Computer	~~Yes~~	No
Calculator Casio Fx92 Collège	~~Yes~~	No
Other authorised equipment	~~Yes~~	No

- Required material:

Rough paper	~~Yes~~	No
Double sheets	~~Yes~~	No

• Collect all the subjects	Yes	~~No~~

For multiple-choice questions, answers may be single or multiple.
A correct answer is worth 100%.
a false or incomplete answer is worth 0.

1. **What is the unit used in the S&OP? (1 Pt)**

A	B	C	D
Quantity of finished products	Quantity of products per family of products	€ or k€	Quantity of components required for a certain production

2. **How frequent this tool (S&OP) can be reviewed? (1 Pt)**

A	B	C	D
Every month	Every day	Every week	2 times a year

3. **In MRP2, what is the order of different tools for planification from the general one to the most detailed? (1 Pt)**

A	B	C	D
1 Sales and Operations Planning 2 Manufacturing Planning and Scheduling 3 Strategy Plan 4 Requirements Calculation 5 Workshop Management	1 Strategy Plan 2 Sales and Operations Planning 3 Manufacturing Planning and Scheduling 4 Requirements Calculation 5 Workshop Management	1 Strategy Plan 2 Requirements Calculation 3 Sales and Operations Planning 4 Manufacturing Planning and Scheduling 5 Workshop Management	1 Workshop Management 2 Requirements Calculation 3 Strategy Plan 4 Sales and Operations Planning 5 Manufacturing Planning and Scheduling

4. **A S&OP is: (1 Pt)**

A	B	C	D
It's a process that brings together all the company's plans (sales, marketing, development, manufacturing, procurement and finance) into a single, integrated set of plans.	A "PIC" in French, a "Plan Industriel et Compatble"	A SOP aims to match resources (manpower, inventory, tool allocations, etc.) with market reality (rising or falling demand). It allows anticipating future investments.	It defines the need for real finished products, a key indicator for production. Once it's in place, we can then break down the requirements into raw materials and components calculation.

5. **What is an appropriate forecast term for strategic plan? (1 Pt)**

A	B	C	D
Few weeks	3 to 10 years	1 to 2 years	Few months

6. **Strategic plans allow foresting, it is the highest term for a cooperation. (1 Pt)**

A	B
True	False

7. **Few tables are composing the S&OP, how many? And what do they correspond to? (1 Pt)**

A	B	C	D
3 tables with Sales, forecast and Production.	3 tables with Stock, Production and Sales.	3 tables with Stock, Production and Budget.	4 tables with the amount of Stock, Production, Budget and Production

8. **Which factor is NOT taken into account, when forecasting sales? (1 Pt)**

A	B	C	D
	Historical trends	Marketing, promotion	Production capacity

9. If you are managing a bicycle production line, what would be a family of products for you? (1 Pt)

A	B	C	D
Montain bikes	Road bikes	A pedal	A chain

10. What is the purpose of a S&OP? (1 Pt)

A	B	C	D
Obtaining a right balance between production capacity (especially future capacities) and demand (especially future demand)	Programming the supplier orders	Programming the manufacturing orders	Facilitating the allocation of the company's key resources

11. Which forecasting method is based on expert opinion? (1 Pt)

A	B	C	D
Time series analysis	Delphi method	Statistical modelling	Moving average method

12. What value is covered in black in position 1? (1 Pt)

	Taille de lot = [redacted]			Délai = [redacted] 5			Stock = 300		SS = 250	
	Niveau = 0 4			Unité = [redacted] 3			Zone ferme = [redacted] 2			
	1	2	3	4	5	6	7	8	9	10
Prévisions restantes	200	600	1 200	1 900	2 400	2 700	2 800	2 900	3 100	3 300
Commandes fermes	1 700	1 500	500	100			1			
Stock disponible -100	0	300	100	100	0	100	[redacted]	0	100	100
PDP (fin)	2 000L	2 400F	2 000F	2 400F	2 400F	2 800	2 800	2 800	3 200	3 200
PDP (déb)	2 400F	2 000F	2 400F	2 400F	2 800	2 800	2 800	3 200	3 200	
Disponible à vendre	400	900	1 000	[redacted] 6	2 300					

A	B	C	D
120	320	100	D

13. What value is covered in black in position 5? (1 Pt)

A	B	C	D
0,5 day	1 week	3 weeks	2 days

14. The MPS is a tool that allows you to: (1 Pt)

A	B	C	D
Keep an eye on the evolution of the allocated budgets	Give to the commercial department the available to sell without disturbing the production planning	Apply what you started into the S&OP	Plan the future investment

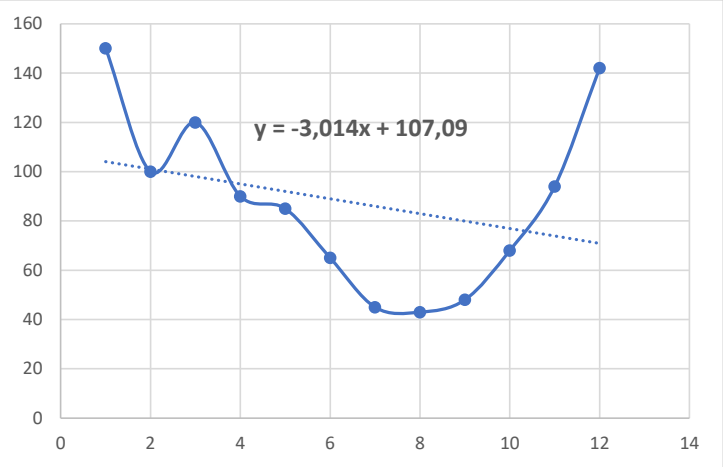
15. Profile of sales, described as seasonal, are calculated with: (1 Pt)

A	B	C	D
Both, qualitative and quantitative approaches	Quantitative approaches	None approaches	Qualitative approaches

16. Considering seasonality and elements on the picture, what are forecasts calculated with method by linear regression and seasonality for next year? (1 Pt)

The seasonality is considered on 1 month. The method 1 is required.

Mois	n	Ventes faites	Coeff de saisonalité
Janvier	1	150	171%
Février	2	100	114%
Mars	3	120	137%
Avril	4	90	103%
Mai	5	85	97%
Juin	6	65	74%
Juillet	7	45	51%
Août	8	43	49%
Septembre	9	48	55%
Octobre	10	68	78%
Novembre	11	94	107%
Décembre	12	142	162%



A	B	C	D
January 122 ; February 147 ; March 85 ; April 61 ; May 15 ; June 39 ; July 14 ; August 23 ; September 24 ; October 32 ; November 41 ; December 59	January 118 ; February 58 ; March 85 ; April 54 ; May 54 ; June 45 ; July 26 ; August 23 ; September 24 ; October 32 ; November 41 ; December 57	January 144 ; February 74; March 111 ; April 61 ; May 54 ; June 45 ; July 26 ; August 29 ; September 24 ; October 25 ; November 41 ; December 58	January 116 ; February 74 ; March 85 ; April 61 ; May 54 ; June 39 ; July 26 ; August 23 ; September 24 ; October 32 ; November 41 ; December 56

17. What would be the profile of sales of a product like a calendar? (1 Pt)

A	B	C	D
Seasonal	Trendy	Erratic	Consistent

18. The MPS is used as input to calculate the Net Requirement Calculation. (1 Pt)

A	B
Yes	No

19. What value is covered in black in position 2? (1 Pt)

A	B	C	D
5 weeks	4 months	1 day	2 weeks

20. With a MPS, we are working on periods such as: (1 Pt)

A	B	C	D
The month	The year	The day	The week

21. Profile of sales, described as erratic, are calculated with: (1 Pt)

A	B	C	D
Quantitative approaches	Both, qualitative and quantitative approaches	Quantitative approaches	None approaches

22. What value is covered in black in position 3? (1 Pt)

A	B	C	D
Requirement calculations	Number of finished products	Budget allocated	Number of sub-assemblies

23. What is the most evolved methodology of forecasting? (1 Pt)

A	B	C	D
Advanced modelling	Machine learning	Demand planning	Statistical abstraction

24. What is a MPS? (1 Pt)

A	B	C	D
A detailed production plan for the next days or weeks. It is also a 'contract' notion between the commercial and the production department commitments.	The delivery schedule for each component of a finished product	The link between the S&OP and the net requirement calculations	The link between the Strategic plan and the net requirement calculations

25. MPS is studying each (1 Pt)

A	B	C	D
ERP	Family of products	Finished products	Component

26. What value is covered in black in position 4? (1 Pt)

A	B	C	D
400	150	300	350

27. What value is covered in black in position 6? (1 Pt)

A	B	C	D
1900	2000	80	1800

28. What is an independent need for a car manufacturer? (1 Pt)

A	B	C	D
Motor	A group of technicians	Windshield	Peugeot 207+

29. What is a BOM? (1 Pt)

A	B	C	D
A list of components composing a finished product	A key performance indicator	A Bill Of Material	A description of the process step by step

30. In case of overload in production, what can you do? (1 Pt)

A	B	C	D
Promotional actions	Hiring operators	Outsourcing activities	Focusing on a specific reference

31. What would be a dependent need for a car manufacturer? (1 Pt)

A	B	C	D
Peugeot 207+	Windshield	Motor	A group of technicians

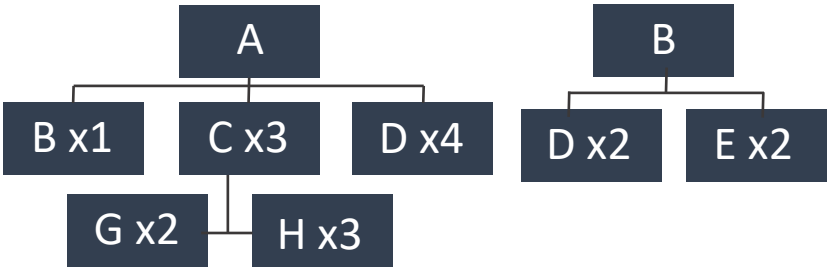
32. What does the KANBAN system bring? (1 Pt)

A	B	C	D
Once the good quantity of Kanban required and the good capacity of container defined, it brings a huge help	In contrast to a big security stock, the KANBAN system will amplificated the problem by revealing them. It will then be possible to work on the problems identified.	Globally it gives you the amount of component needed for a specific finished product.	It will simplify the choice of the customers

33. What does KANBAN mean? (1 Pt)

A	B	C	D
Stock	Component	Enough Stock	Label

34. On which part would you run your first net requirement calculation? (1 Pt)



A	B	C	D
C or B	D or E	A or B	E or C

35. With a BOM of several levels of components, we must take care of the requirements coming from all levels of materials? (1 Pt)

A	B	C	D
True	False		

36. On which part would you run your second net requirement calculation? (1 Pt)

A	B	C	D
B or A	A or C	D or A	C or D

37. What is a BOP? (1 Pt)

A	B	C	D
A list of components composing a finished products	A Bill Of Material	A description of the process, step by step	A key performance

38. What is an essential input to perform the CBN? (1 Pt)

A	B	C	D
Delivery time for each component	Current stock levels for each component	Maintenance costs and Transport costs	Quantity of safety stock for each component

39. Independents needs can be estimated by forecasts and dependents needs must be calculated. (1 Pt)

A	B
True	False

40. An operator takes a 20-minute break. Which indicator will be affected: the OEE or the operational OEE, and why? (1 Pt)

A	B	C	D
When an operator takes a break, this is considered as an organizational stop. These stops are not taken into account when calculating the OEE. The indicator impacted will be the TRG.	When an operator takes a break, this is considered as an unexpected stop. These stops are not taken into account when calculating the OEE. The indicator impacted will be the TRG.	When an operator takes a break, this is considered as an unexpected stop. These stops are not taken into account when calculating the OEE. The indicator impacted will be the TRE.	When an operator takes a break, this is considered as an organizational stop. These stops are not taken into account when calculating the OEE. The indicator impacted will be the TRS.

41. Among the rates that make up the OEE, one may be higher than 100%. Which one and why? (1 Pt)

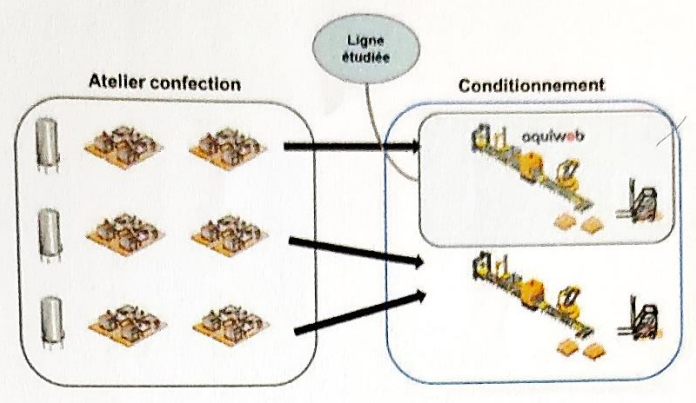
A	B	C	D
The only rate that can be positive is the performance rate. An operator can manually increase the production rate of his machine. The actual rate will then be higher than the theorical rate.	The only rate that can be positive is the availability rate. An operator can manually increase the stock rate. The actual rate will then be higher than the theorical rate.	The only rate that can be positive is the quality rate. An operator can manually increase the quality of the finished product. The actual rate will then be higher than the theorical rate.	The only rate that can be positive is the attendance rate. An operator can manually increase the variability of the finished product. The actual rate will then be higher than the theorical rate.

42. In AquiWeb, what does a 15sec stop in the MES correspond to, and why should we follow it? (1 Pt)

A	B	C	D
It corresponds to a consequent stop, many investigations are required to define their impact on our production.	It corresponds to a consequent stop, they are irrelevant	It corresponds to a micro-stop. We're going to monitor these micro-stops to assess their impact on our production.	It corresponds to a micro-stop. They are irrelevant.

43. **I'm a production manager at a food processing plant specializing in chocolate. I set up Aquiweb on my packaging lines to monitor performance in real time. They package a single product at a time, which is produced by the confectionery workshop. I notice several stoppages on my waterfall for the day:**
    - **Conveyor failure (time: 1h and frequency: 20x)**
    - **Lack of supplies (time: 6h and frequency: 5x)**
    - **Control machine adjustment (time: 15min and frequency: 1x)**
    - **Line bottleneck (time: 2h and frequency 7x)**

    Based on this data, what actions could I take to improve my availability rate? (1 Pt)



A	B	C	D
Two stops can be linked to the same problem: lack of supplies and line congestion. They represent a significant loss of time and frequency. We can deduce that the production rate is too high. We can say that the previous production zone is the bottleneck of our line. I can: -Reduce the speed of our packaging line to prevent bottlenecks and limit supply shortages and adapt to the garment workshop. - Install a screen in the workshop to monitor production in the garment department. - Package several products on the same line to increase the number of incoming products. -Increase staff on the previous workshop.	All stops are independent and cannot be linked to the same problem. As they represent an insignificant loss of time and frequency. We can deduce that the production rate is hight enough.	Only the MES software can deduce something.	The conveyor often breaks down but does not represent a significant downtime. Here are some suggestions: - Implement preventive maintenance to make the conveyor more reliable. - Train operators on the signs of conveyor failure. - Reduce production rate to reduce conveyor stress.

44. **In AquiWeb, what rates are used to calculate OEE? What events can affect them during production? (1 Pt)**

A	B	C	D
Performance rate. Impacted by the number of operators on the assembly line.	Attendance rate. Impacted by the diversity of finished products	Availability rate. This is impacted by unexpected stoppages on the line (breakage, waiting for material, etc…).	Quality rate. Impacted by rejects, scrap, waste on my line.

45. **What is a MES? (1 Pt)**

A	B	C	D
MES softwares are updating its data very frequently, few time a minute.	Basically MES software is updating its data once a day	MES provides information that helps manufacturing decision-makers understand how current conditions on the plant floor can be optimized to improve production output.	Manufacturing execution system