

# Subject A

|                       |                        |
|-----------------------|------------------------|
| Teacher(s):           | RAGOT – HASSAYOUNE     |
| Head of department:   | RAGOT                  |
| Module:               | EC07-Industrialisation |
| Promotion:            | 2025                   |
| Date of the exam:     | 08/01/2024             |
| Time of the exam:     | 13h00                  |
| Duration of the exam: | 1h                     |

- Exam organisation for people with disabilities:

**1 hour + extra time  
(one third)**

~~1h30; adapted  
subject~~

~~not concerned~~

- Authorised material:

|                               |                |    |
|-------------------------------|----------------|----|
| Computer                      | <del>Yes</del> | No |
| Calculator Casio Fx92 Collège | <del>Yes</del> | No |
| Other authorised equipment    | <del>Yes</del> | No |

- Required material:

|               |                |    |
|---------------|----------------|----|
| Rough paper   | <del>Yes</del> | No |
| Double sheets | <del>Yes</del> | No |

- Collect all the subjects
- |     |               |
|-----|---------------|
| Yes | <del>No</del> |
|-----|---------------|

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. Traceability is costing huge amount of money and decision taking of implementation is complex (1 Pt)**

| A    | B     | C | D |
|------|-------|---|---|
| True | False |   |   |

**2. A Milestone is a short moment during which the core team is investigating and validating (or not) the expected deliverables (1 Pt)**

| A    | B     | C | D |
|------|-------|---|---|
| True | False |   |   |

**3. Which of these tasks are commonly managed by Industrialization: (1 Pt)**

| A                  | B                      | C           | D     |
|--------------------|------------------------|-------------|-------|
| Project Management | Continuous Improvement | Maintenance | Tests |

**4. Industrialization is in relationship with PMO to: (1 Pt)**

| A                               | B   | C   | D  |
|---------------------------------|---|---|--|
| apply tools from PMI & Prince 2 | Report the progress of industrialization activities | lead some strategic company project (Project Management Office) | understand marketing needs (Project Marketing of Object) |

**5. A waterjet cutting is able to cut: (1 Pt)**

| A      | B     | C       | D     |
|--------|-------|---------|-------|
| Carton | Stone | Leather | Metal |

**6. Purpose of conformal coating is to: (1 Pt)**

| A               | B             | C              | D                    |
|-----------------|---------------|----------------|----------------------|
| avoid oxidation | avoid hacking | avoid moisture | avoid short circuits |

**7. Potting is: (1 Pt)**

| A   | B  | C                      | D                    |
|---|--|------------------------|----------------------|
| for flowers, but nothing to do with that training | A resin filling the PCBA and its container | A PCBA design by Harry | impossible to repair |

**8. Who is doing what? (1 Pt)**

| A  | B   | C  | D  |
|--|---|--|--|
| BOM (flat) is done by Industrialization, transformation process and structured BOM are done by R&D | BOM (flat) is done by R&D, transformation process and structured BOM are done by Logistic | BOM (flat) is done by Sales, transformation process and structured BOM are done by Industrialization | BOM (flat) is done by R&D, transformation process and structured BOM are done by Industrialization |

**9. What is the ultimate goal of industrialization? (1 Pt)**

| A                            | B                   | C                   | D               |
|------------------------------|---------------------|---------------------|-----------------|
| To satisfy Customers' demand | To increase Volumes | To increase Quality | To reduce Costs |

**10. An industrial milling centre is costing (Average): (1 Pt)**

| A     | B   | C   | D    |
|-------|-----|-----|------|
| 100k€ | 1M€ | 1k€ | 10k€ |

**11. What are the key competencies required for a “good project leader”? (1 Pt)**

| A  | B                      | C   | D   |
|--|------------------------|---|---|
| Having good understanding of skills related to the project | Very good communicator | Able to synthesize, prioritize, motivate the team | Charism (indirect management), able to convince |

**12. Industry 4.0 was created: (1 Pt)**

| A   | B   | C   | D   |
|---|---|---|---|
| in Germany, in 2021 to compete with China | in Germany, in 2011 to compete with India | in China, in 2011 to compete with Germany | in Germany, in 2011 to compete with China |

**13. Silk printing is an industrial commonly used process: (1 Pt)**

| A    | B     | C | D |
|------|-------|---|---|
| True | False |   |   |

**14. A “Stakeholder” is: (1 Pt)**

| A                                      | B      | C  | D   |
|--|--------|--|---|
| Somebody that will finance the project | Nobody | Somebody that is, concerned by the project | Somebody that is not concerned by the project |

**15. For organization of Industrialization: There is no good or bad solution, just the one corresponding to: (1 Pt)**

| A                   | B                 | C                 | D                     |
|---------------------|-------------------|-------------------|-----------------------|
| The faster delivery | the best solution | The market demand | The need from the CEO |

**16. An empiric value for “Cost of Inventory ownership” should be: (1 Pt)**

| A                            | B                            | C                            | D                              |
|------------------------------|------------------------------|------------------------------|--------------------------------|
| between 10 and 25% per annum | between 50 and 75% per annum | between 1 and 2.5% per annum | between 100 and 250% per annum |

**17. PCBA Stress can occur: (1 Pt)**

| A                          | B              | C               | D                 |
|----------------------------|----------------|-----------------|-------------------|
| During component placement | During storage | During Assembly | During dilatation |

**18. (Industrial) Project risk management is: (1 Pt)**

| A                   | B  | C             | D  |
|---------------------|--|---------------|--|
| Prepare for the war | Considering some “probable” events that might occur and jeopardize the delivery of the project | Pray and wait | Preparing some corrective actions in case something is happening |

**19. Conformal coating in: (1 Pt)**

| A                                     | B                                | C         | D                                 |
|---------------------------------------|----------------------------------|-----------|-----------------------------------|
| A varnish applied on most of the PCBA | A trench coat placed on the PCBA | A overlay | A varnish applied on ALL the PCBA |

**20. A project leader is necessary a Product Owner or Scrum Master (1 Pt)**

| A    | B     | C | D |
|------|-------|---|---|
| True | False |   |   |

**21. A SMT reflow process can be single or double side: (1 Pt)**

| A    | B     | C | D |
|------|-------|---|---|
| True | False |   |   |

**22. Electronic tests of PCBA can be done: (1 Pt)**

| A        | B            | C                  | D                  |
|----------|--------------|--------------------|--------------------|
| visually | functionally | with flying probes | with burning tests |

**23. For finished products stock only: How do I calculate the inventory stock value? (1 Pt)**

| A   | B  | C  | D  |
|---|--|--|--|
| $Sv = \text{Stock value} = \text{Yearly turnover} \times (\text{time between ready for sales} + \text{payment lead time}) / 31$ | $Sv = \text{Stock value} = \text{Yearly turnover} \times (\text{time between ready for sales} + \text{payment lead time}) / 100$ | $Sv = \text{Stock value} = \text{Yearly turnover} \times (\text{time between ready for sales} + \text{payment lead time}) / 180$ | $Sv = \text{Stock value} = \text{Yearly turnover} \times (\text{time between ready for sales} + \text{payment lead time}) / 365$ |

**24. Which of the following terms are used to name the activities performed by Industrialization: (1 Pt)**

| A   | B       | C                      | D                         |
|-----|---------|------------------------|---------------------------|
| R&D | Methods | Industrial engineering | Manufacturing Engineering |

**25. Industrialization is in relationship with Top Management to: (1 Pt)**

| A                                    | B                    | C  | D                 |
|--------------------------------------|----------------------|--|-------------------|
| decide about manufacturing locations | identify competitors | make Business Hypothesis, sensitivity to external fluctuations | increase salaries |

**26. The consequence of PCBA pollution is: (1 Pt)**

| A                    | B                     | C                   | D            |
|----------------------|-----------------------|---------------------|--------------|
| reduced performances | insects into products | smelling of product | Bad contacts |

**27. Which of the following processes are "surface treatments" for Plastics? (1 Pt)**

| A        | B              | C      | D      |
|----------|----------------|--------|--------|
| Painting | Chrome plating | Corona | Plasma |

**28. Which of the following processes are "Assembly by welding"? (1 Pt)**

| A   | B         | C   | D   |
|-----|-----------|-----|-----|
| MIG | Resistive | MUG | TAG |

**29. ESD is the plague (la peste) or the scourge (le fléau) of electric industry: what is the ONLY solution? (1 Pt)**

| A          | B           | C         | D          |
|------------|-------------|-----------|------------|
| Reparation | Elimination | Connexion | Prevention |

**30. What is the INDIRECT labour definition? (1 Pt)**

| A  | B   | C   | D   |
|--|---|---|---|
| INDIRECT means: we can't directly see their labour activities on the product | INDIRECT means: 1h labour for 1 product. Less or more than 10h labour for 10 products | INDIRECT means: not directly impacting the quality of the product | INDIRECT means: creating non added value on the product |

**31. Deep stamping is used for: (1 Pt)**

| A                     | B                    | C                    | D          |
|-----------------------|----------------------|----------------------|------------|
| Drilling metal sheets | Pan (fr: casseroles) | oil and gaz drilling | Automotive |

**32. Smartphones currently manufactured are: (1 Pt)**

| A   | B  |  |  |
|---|--|--|--|
| Almost all identical because they are mass produced in a factory in China | All different because of the variety of apps installed by the user |  |  |

**33. A injection specific tool can cost up to: (1 Pt)**

| A     | B     | C    | D    |
|-------|-------|------|------|
| 100k€ | 300k€ | 30k€ | 10k€ |

**34. Industrialization is in relationship with Quality to: (1 Pt)**

| A                  | B                         | C            | D            |
|--------------------|---------------------------|--------------|--------------|
| Validate equipment | Generate the best quality | prepare FMEA | reduce costs |

**35. "SMT" means: (1 Pt)**

| A                    | B                      | C                        | D  |
|----------------------|------------------------|--------------------------|--|
| Surface Mount Device | Solid Mount Technology | Surface Mount Technology | Simultaneous Multi-Threading: but nothing to do with that test |

**36. In the definition available on Wikipedia describing Industrialization, the following tasks are listed: (1 Pt)**

| A                               | B                              | C   | D                                   |
|---------------------------------|--------------------------------|---|-------------------------------------|
| optimization of complex systems | improving systems of knowledge | may also overlap with operations research | central to manufacturing operations |

**37. Industrialization is in relationship with Marketing to: (1 Pt)**

| A  | B  | C                       | D                       |
|--|--|-------------------------|-------------------------|
| prepare the communication Marketing plan | prepare phase in and phase out of products | define the user stories | make the Marketing plan |

**38. Plastic injection machine is much cheaper than Metal stamping machine (1 Pt)**

| A     | B    |  |  |
|-------|------|--|--|
| False | True |  |  |

**39. A vibrating bowl feeder is used to: (1 Pt)**

| A                               | B                             | C              | D             |
|---------------------------------|-------------------------------|----------------|---------------|
| Feed the bowls to the customers | Provide parts with vibrations | Assemble parts | Mix Materials |

**40. If I read 1002 on an SMD component it means: (1 Pt)**

| A                                     | B                             | C                                    |  |
|---------------------------------------|-------------------------------|--------------------------------------|--|
| the size of the resistor is 1mmx0,2mm | The resistor value is 10kohms | the size of the resistor is 10mmx2mm |  |

**41. Burning tests are used to: (1 Pt)**

| A                                  | B                             | C  | D                                   |
|------------------------------------|-------------------------------|--|-------------------------------------|
| test the PCBA resistance into fire | Accelerate "infant" mortality | simulate the strong conditions of life usage | Test the resistance of firefighters |

**42. Fr: trempe is in English: (1 Pt)**

| A      | B         | C          | D        |
|--------|-----------|------------|----------|
| Ageing | Quenching | Quetsching | Staining |

**43. The only solution for PCBA stress is: (1 Pt)**

| A             | B         | C                   | D         |
|---------------|-----------|---------------------|-----------|
| Flexible PCBA | No Stress | Music in production | Yoga PCBA |

**44. Mechanical assemblies can be: (1 Pt)**

| A         | B        | C       | D       |
|-----------|----------|---------|---------|
| soldering | screwing | glueing | welding |

**45. Industrialization is in relationship with Supply Chain to: (1 Pt)**

| A                                       | B                     | C  | D  |
|---|-----------------------|--|--|
| define the length and size of the chain | prepare "make or buy" | define the replenishment parameters in the ERP | define the flows of every single component |

**46. A "Shareholder" is: (1 Pt)**

| A   | B      | C                                      | D   |
|---|--------|--|---|
| Somebody that is concerned by the project | Nobody | Somebody that is financing the project | Somebody that is not concerned by the project |

**47. "Direct sourcing" in: (1 Pt)**

| A  | B  | C   | D |
|--|--|---|---|
| everything that is directly sourced by the company | everything that is part of the product (Bill Of Material) like raw material, parts, stickers | everything that is bought 'at the source' |   |

**48. MTO means: (1 Pt)**

| A                     | B                  | C                        | D             |
|-----------------------|--------------------|--------------------------|---------------|
| Machine Time Ordering | Mean Time Ordering | Maintenance Time Offered | Make To Order |

**49. This are robots: (1 Pt)**

| A      | B     | C     | D          |
|--------|-------|-------|------------|
| Cobots | Polar | Scara | Terminator |

**50. Industrialization is in relationship with IT to: (1 Pt)**

| A  | B               | C           | D           |
|--|-----------------|-------------|-------------|
| find the best IT tools to support industrialization activities | Design 3D parts | Buy Divalto | program PLC |

**51. PCBA means: (1 Pt)**

| A                              | B                              | C                               | D                                  |
|--------------------------------|--------------------------------|---------------------------------|------------------------------------|
| Placed Circuit Board Assembled | Plated Circuit Board Assembled | Printed Circuit Board Assembled | Printed Components Board Assembled |

**52. A THT process means: (1 Pt)**

| A                    | B                    | C                       | D |
|----------------------|----------------------|-------------------------|---|
| True Hall Technology | Two Holes Technology | Through Hole Technology |   |

**53. Wage and direct salary costs includes: (1 Pt)**

| A                          | B                | C                                 | D                                  |
|----------------------------|------------------|-----------------------------------|------------------------------------|
| Net wage given to employee | absenteeism cost | Bonus and accessories free of tax | Social burden tax paid by employer |

**54. Traceability system is necessarily using Digital & IoT technologies (1 Pt)**

| A     | B    |  |  |
|-------|------|--|--|
| False | True |  |  |

**55. “Indirect sourcing” is (1 Pt)**

| A   | B  | C  |  |
|---|--|--|--|
| everything that is not bought “at the source” | everything that is not “Direct like Tools, maintenance costs, external consultant, machinery | everything that is not directly sourced by the company |  |

**56. EDM (Electrical Discharge Machining) is named in French (1 Pt)**

| A                           | B                    | C                               | D                         |
|-----------------------------|----------------------|---------------------------------|---------------------------|
| Machine de test de décharge | Machine électronique | Machine électrique de machinage | Machine d'électro-érosion |

**57. Which of the following processes are “surface treatments” for Metals? (1 Pt)**

| A           | B        | C              | D         |
|-------------|----------|----------------|-----------|
| Phosphating | Painting | Silver plating | Tempering |

**58. NVP result at 4 years in a business plan is: (1 Pt)**

| A                            | B                        | C  | D                                   |
|------------------------------|--------------------------|--|-------------------------------------|
| The tax the company will pay | The Non-Visible Payments | The money earned or lost after 4 years of production & deliveries of the project | The money invested into the project |

**59. Tests in production are made: (1 Pt)**

| A                      | B      | C              |  |
|------------------------|--------|----------------|--|
| By attribute (go/nogo) | By QCM | By measurement |  |

**60. What are the constraints that needs to be considered for electronic assembly? (1 Pt)**

| A    | B           | C        | D   |
|------|-------------|----------|-----|
| Dust | Temperature | Humidity | ESD |

**61. Industrialization is in relationship with Toolshop to: (1 Pt)**

| A                        | B                                       | C                                   | D   |
|--------------------------|---|-------------------------------------|---|
| define the costs of sale | Define the number of cavities per tools | Prepare Single Minutes Exchange Die | define the list of products to be sold by the shops |

**62. A stamping tool is depreciated (in French) during: (1 Pt)**

| A       | B      | C        | D       |
|---------|--------|----------|---------|
| 8 years | 1 year | 30 years | 4 years |

**63. Industrialization is in relationship with R&D to: (1 Pt)**

| A   | B  | C  | D                   |
|---|--|--|---------------------|
| preform technical feasibility evaluations | perform economic feasibility evaluations | challenge technical product solutions with technical solutions for process | realize 2D drawings |

**64. Laser welding is better than ultrasonic welding (1 Pt)**

| A     | B   | C     | D |
|-------|---|-------|---|
| False | this question has no sense as long as I don't know the field of application | False |   |

**65. In a Business Plan, if the NPV after 4 years is higher than the NPV after 8 years: (1 Pt)**

| A                            | B                       | C  | D                                   |
|------------------------------|-------------------------|--|-------------------------------------|
| The company is loosing money | I'll loose my customers | The profitability of the company is decreasing | The shareholder will ask money back |

**66. Payback result in a business plan is: (1 Pt)**

| A  | B  | C                                   | D  |
|--|--|-------------------------------------|--|
| The time it takes to get the money from the Stakeholders | The time it takes to get the money from the Shareholders | The boomerang effect of the finance | The time it takes for the project to become profitable |

**67. To improve the figures into my business plan, I can: (1 Pt)**

| A                         | B               | C                            | D                  |
|---------------------------|-----------------|------------------------------|--------------------|
| Fake the figures in Excel | Win new markets | Sell my product higher price | Make Lean projects |

**68. What is DIRECT labour definition? (1 Pt)**

| A   | B  | C  | D   |
|---|--|--|---|
| Direct means: 1h labour for 1 product. 10h labour for 10 products | Direct means: creating only added value on the product | Direct are paid directly, indirect are paid through interim agencies | Direct means: directly impacting the quality of the product |

**69. Which standard applies to Environmental Product Declaration? (1 Pt)**

| A        | B        | C        | D |
|----------|----------|----------|---|
| ISO14027 | ISO14021 | ISO14025 |   |



**70. What is the right definition of a joint declaration? (1 Pt)**

| A  | B  |
|--|--|
| A joint declaration is performed for several products across multiple manufacturers. | A joint declaration is performed for several commercial references, from a single manufacturer, belonging to a homogeneous environmental family. |

**71. ISO 14020 applies to PEP ecopassport (1 Pt)**

| A    | B     |  |  |
|------|-------|--|--|
| True | False |  |  |

**72. PEP ecopassport allows? (1 Pt)**

| A                            | B                           | C                  |  |
|------------------------------|-----------------------------|--------------------|--|
| Products family declarations | Single product declarations | Joint declarations |  |

**73. Footprint Declaration is another name given to Environmental Product Declaration (1 Pt)**

| A    | B     |  |  |
|------|-------|--|--|
| True | False |  |  |

**74. The Module D in PEP ecopassport corresponds to a net calculation of the environmental impact prevented at end of life (1 Pt)**

| A    | B     |  |  |
|------|-------|--|--|
| True | False |  |  |

**75. What is the right definition of the Functional unit? (1 Pt)**

| A  | B  | C   |  |
|--|--|---|--|
| measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit | quantity of product used as a reference for the environmental declaration (could be expressed in weight, length, surface area, volume, etc...) | quantified performance of a product system for use as a reference unit in a life cycle assessment |  |

**76. PEP ecopassport doesn't consider benefits and loads beyond the life cycle (1 Pt)**

| A    | B     |  |  |
|------|-------|--|--|
| True | False |  |  |

**77. A self-declaration must be verified by third party (1 Pt)**

| A    | B     |  |  |
|------|-------|--|--|
| True | False |  |  |

**78. Which standard applies to Eco-labels? (1 Pt)**

| A        | B        | C        |  |
|----------|----------|----------|--|
| ISO14021 | ISO14025 | ISO14024 |  |

**79. Which claims are environmental self-declarations? (1 Pt)**

| A                   | B               | C                             |  |
|---------------------|-----------------|-------------------------------|--|
| PEFC certified wood | Compostable bag | Contain 20% recycled material |  |

**80. Choose the right statement (1 Pt)**

| <b>A</b>  | <b>B</b>  | <b>C</b>  |  |
|---|---|---|--|
| In an Environmental Product Declaration programme, no rules are set | In an Environmental Product Declaration programme, same rules apply to all products | In an Environmental Product Declaration programme, product category rules apply to each specific product category |  |