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ESE- 2020 (Prelims) - Offline Test Series

GENERAL STUDIES AND ENGINEERING APTITUDE

SUBJECT: GENERAL PRINCIPLES OF DESIGN, DRAWING, IMPORTANCE OF SAFETY SOLUTIONS

01. Ans: (d)

- 02. Ans: (c)
- **Sol:** The primary purpose of VOC data is to obtain as much information as necessary from the customer to define Critical To Quality (CTQ) requirements.

03. Ans: (d)

- **Sol:** Implementing a web survey does not cost as much as an interview or focus group.
- 04. Ans: (b)

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06. Ans: (b)
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Sol:

05. Ans: (a)

Sol: Balanced design approach maintains same Factor of safety through out each element of a machine. Critical Element in a machine is the one which has the lowest Safety factor.

Test-14



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07. Ans: (a)

Sol: DFMEA is used in the design of a new product to uncover potential failures where as

PFMEA is used on existing processes to uncover potential failures.

08. Ans: (c)

Sol: 1. Identify the problem

2. Analyse or break the problem into solvable parts

3. Find the solutions to those solvable parts (not given)

4. Synthesis or combine the above solutions to build a unique solution

5. Build a model, mockup or prototype

6. Test the product or design for working conditions

7. Evaluate the performance of the design

- **09.** Ans: (b)
- 10. Ans: (a)
- 11. Ans: (d)

12. Ans: (b)

- **Sol:** The user whenever he is interacting with a machine has to occupy some space from where the user interacts with the machine (Occupy the workspace). Then he starts working with machine by starting it using it (source of Power). While the machine is working he continuously checks the output (acts as a sensor) and then base on the intended quality he handles the machine output (controls the machine)
- 13. Ans: (b)
- 14. Ans: (a)

15. Ans: (b)

Sol:

- <u>Stereotyping:</u> Thinking conventionally or traditional way of thinking
- <u>Information overload</u>: You become so overloaded with minute details that you are unable to sort out the critical aspects of the problem.
- <u>**Fixation:**</u> Inability to think from a fresh perspective
- **<u>Priming:</u>** Inability to think beyond the given set of examples

16. Ans: (a)

Sol:

- <u>Stereotyping:</u> Thinking conventionally or traditional way of thinking
- **Information overload:** You become so overloaded with minute details that you are unable to sort out the critical aspects of the problem.
- **<u>Fixation:</u>** Inability to think from a fresh perspective
- **<u>Priming:</u>** Inability to think beyond the given set of examples

17. Ans: (b)

Sol:

- <u>Stereotyping:</u> Thinking conventionally or traditional way of thinking
- <u>Information overload:</u> You become so overloaded with minute details that you are unable to sort out the critical aspects of the problem.
- <u>**Fixation:**</u> Inability to think from a fresh perspective
- **<u>Priming</u>**: Inability to think beyond the given set of examples

18. Ans: (b)

Sol: Deploying the product happens at customer locations for the customer usage.



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- **19.** Ans: (b)
- 20. Ans: (c)
- 21. Ans: (d)
- 22. Ans: (a)
- Sol: Component-sharing modularity. This type of modularity exists when a family of dissimilar products uses the same assembly or component.

Component-swapping modularity. This type of modularity exists in a product that is differentiated only by a single component or assembly.

Cut-to-fit modularity. This is а customization whereby strategy а component's parameters or features can be adjusted within a given range to provide a variety of products.

Platform modularity. This form of modularity describes products that consist of different combinations of modules assembled on the same basic structure, as in the bus modularity discussed above or automobiles

- 23. Ans: (c)
- 24. Ans: (a)
- 25. Ans: (a)
- 26. Ans: (a)
- 27. Ans: (d)
- Sol: Periodic Maintenance of boiler is compulsory, periodic training of employees, checking of fire equipment not only helps in avoiding fire accidents but also minimizing the damage in case of any fire accidents. Equipping fail safe equipment contain the fire from spreading. Involving employees, supervisors and management in establishing

safety goals helps in maintaining the commitment of the organization towards the safety goals.

28. Ans: (c)

- **Sol:** Designers shall consider safety factors even when worst case design is implemented.
- 29. Ans: (d)

30. Ans: (d)

Sol: Prototyping is the most expensive type of testing Brainstorming has a disadvantage like if a

highly experienced person participates in a brainstorming session, he can dominate the session

Prototype testing gives realistic data for the design testing.

Virtual prototyping uses computer aided technologies to test the design like CAD, CAE etc.

- 31. Ans: (a)
- 32. Ans: (d)
- 33. Ans: (c)
- Sol: Cause effect diagram is also known as Ishikawa diagram or fish bone diagram. Here, the highest frequent or severe causes are highlighted for further discussion among the design team.
- 34. Ans: (b)
- 35. Ans: (d)
- 36. Ans: (c)
- Sol: Statement (5) is incorrect.

As Mock-ups are built during conceptual design stage.

37. Ans: (b)

SSC-JE (Paper-II) MAINS 2018

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38. Ans: (c) 39. Ans: (a)

40. Ans: (b)

41. Ans: (c)

Sol: Removal Processes like grinding, turning, machining etc. produce huge amount of scrap (unwanted material removed from the product).

42. Ans: (a)

Sol: In developmental design or redesign, existing product is improvised based on customer feed back or complains. In reverse engineering the sub functions of an existing product are identified.

43. Ans: (c)

- Sol: Situations of Hazard the correct order is:
 - 1. Identification of Hazard
 - 2. Analyze the Hazard

- Decision to Avoid Hazard
 Ability to Avoid Hazard
 Safe Behaviour
- 44. Ans: (a)
- 45. Ans: (c)
- 46. Ans: (b)
- 47. Ans: (d)
- **Sol:** Reverse engineering is exactly the reverse of Functional decomposition or functional tree.
- 48. Ans: (c)
- **Sol:** Morphological methods are used during the conceptual stage of design.
- 49. Ans: (b)
- 50. Ans: (b)