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Test Centres: Delhi, Hyderabad, Bhopal, Jaipur, Lucknow, Bhubaneswar, Pune, Kolkata, Patna**ESE 2023 : Prelims Exam | GS & ENGINEERING
CLASSROOM TEST SERIES | APTITUDE** **Test 13****Section A :** Standards & Quality practices in production, construction, maintenance & services [All Topics]**Section B :** Information and Communication Technologies (ICT) [All Topics]**Section C :** Ethics and Values in Engineering Profession [All Topics]**ANSWER KEY**

1. (d)	11. (b)	21. (b)	31. (d)	41. (b)
2. (b)	12. (a)	22. (d)	32. (d)	42. (d)
3. (b)	13. (b)	23. (c)	33. (a)	43. (d)
4. (d)	14. (a)	24. (a)	34. (d)	44. (c)
5. (b)	15. (b)	25. (a)	35. (d)	45. (d)
6. (d)	16. (c)	26. (b)	36. (d)	46. (c)
7. (a)	17. (c)	27. (d)	37. (b)	47. (d)
8. (d)	18. (d)	28. (d)	38. (b)	48. (b)
9. (c)	19. (b)	29. (b)	39. (b)	49. (b)
10. (d)	20. (b)	30. (a)	40. (d)	50. (d)

DETAILED EXPLANATIONS

2. (b)
Appraisal costs are the costs to determine conformance with quality standards. It include costs associated with inspection of materials, setup of test equipment, maintenance and calibration of test equipment.
3. (b)
Major contributions of Deming are Deming cycle, 14 points for transforming management, 7 deadly diseases and Deming profound knowledge.
4. (d)
The contributions of Philip Crosby
- Zero defect
 - Cost of poor quality
 - Quality is free
5. (b)
- **Check sheet** : It is used to keep track of defects or make sources for people to collect data in correct manner.
 - **Pareto analysis** : It approaches problem systematically, discovers the sources that may cause the majority of problems.
 - **Control chart** : It is graph used to study how the process changes over time in which observations are plotted in the time order.
 - **Histogram** : It is a type of bar chart that is used to represent statistical information by the way of bins to show the frequency distribution of continuous data.
6. (d)
Scatter plots consists of plotting data to depict the relationship between two variables and not fishbone diagram. Fishbone diagram is also called cause and effect diagram developed by Kaoru Ishikawa.
7. (a)
Here, $N = 100$, $n = 10$, $P_a = 0.6$, $P = 0.15$

$$\begin{aligned}\therefore AOQ &= P_a P \left(\frac{N-n}{N} \right) \\ &= 0.6 \times 0.15 \times \left(\frac{100-10}{100} \right) = 0.081\end{aligned}$$

9. (c)

$$\text{Tolerance} = 0.4$$

$$\text{Loss} = 0.5 \times 160 + 0.5 \times 0 = ₹80$$

According to Taguchi loss function,

$$L = k(y - y_0)^2$$

$$80 = k \times (0.4)^2 \quad [\because y - y_0 = 0.4]$$

\therefore

$$k = ₹500$$

10. (d)

- C - Chart : When number of defects per unit are counted.
- R - Chart : Shows the variation in the range of samples.
- \bar{X} - Chart : Used to control the average quality of product.
- P - Chart : Used to monitor and control the fraction produced in a process that is defective or non-conforming.

11. (b)

Tools	Applications
Pareto chart	Analyse
Scatter diagram	Analyse, Improve
Cause and effect diagram	Analyse
Flow chart	Define
Check chart	Measure, Analyse
Histogram	Measure, Analyse
Control chart	Control

12. (a)

TQM is a process-oriented approach as against the traditional result-oriented approach.

13. (b)

- ISO 9000 : 2015 → Covers the basic concepts and language.
- ISO 9001 : 2015 → Sets out requirements of a quality management system.
- ISO 9004 : 2009 → Focuses on how to make a quality management system more effective and efficient.
- ISO 19011 : 2011 → Sets out guidance on the internal and external audits of quality management systems.

14. (a)

'A' item → Most costly and valuable items. (10 to 20)% of items accounts. For 75% of the total capital invested in the inventory. So no safety stock is considered.

15. (b)

Reactive/Breakdown maintenance can be viewed as double-edged sword.

16. (c)

The reliability of the given system will be

$$R_S = 1 - (1 - R_1)(1 - R_2)(1 - R_3)$$

or

$$R_S = R_1 + R_2(1 - R_1) + R_3(1 - R_1)(1 - R_2)$$

17. (c)

$$\text{MTTF for module in series connection} = \frac{1}{n\lambda}$$

$$\Rightarrow \text{MTTF} = \frac{1}{5 \times 0.0005} = \frac{10000}{25} = 400 \text{ hr}$$

18. (d)

$$\text{Availability} = \frac{\text{MTBF}}{\text{MTBF} + \text{MTTR}}$$

$$\text{MTBF} = \frac{1600}{4} = 400 \text{ hours}$$

$$\text{MTTR} = 200 \text{ hours}$$

$$\therefore \text{Availability} = \frac{400}{400 + 200} = \frac{400}{600} = 0.67$$

19. (b)

In useful-life phase, only random failures occur which are unpredictable and cannot be prevented.

The following can be probable reason for failure in useful life phase:

1. Unexplainable cause
2. Human error
3. Low safety factor
4. High random stress than expected
5. Undetectable failure

20. (b)

Given : $D = 900$, $C_0 = ₹100$, $C_h = ₹2/\text{unit}$

$$\therefore \text{EOQ} = \sqrt{\frac{2DC_0}{C_h}} = \sqrt{\frac{2 \times 900 \times 100}{2}} = 300$$

21. (b)

Kanban is scheduling system for just-in-time (JIT) production. Kanban is a system to control the logistical chain from a production point of view and is not an inventory control system. Kanban is one method through which (JIT) is achieved.

22. (d)
In deterministic inventory control model, demand and lead time are known with certainty and are constant, so need not to carry safety or buffer stock.
26. (b)
A Wi-Fi standard enabling devices to easily connect with each other without requiring a wireless access point is called as Wi-Fi Direct which was initially called Wi-Fi P2P (Peer to Peer).
30. (a)
An SSL layer uses public key encryption, i.e. asymmetric key encryption.
31. (d)
ATX is a power port available on the motherboard
40. (d)
Every attitude has three components that are represented in ABC model of attitude.
- A : for Affective
 - B : for Behavioral
 - C : for Cognitive
41. (b)
Carol Gilligan states that the post-conventional level of moral thinking can be dealt based on the two types of thinking. Gilligan's theory is based on the two main ideas, the care-based morality (usually found in women) and the justice-based morality (usually found in men).
43. (d)
Business ethics is a form of applied ethics or professional ethics, that examines ethical principles and moral or ethical problems that can arise in a business environment. It applies to all aspects of business conduct and is relevant to the conduct of individuals and entire organizations.
45. (d)
- The act of Whistleblowing can cause conflict of interest between personal, organizational and societal spheres. Hence statement 1 is incorrect.
 - Whistleblowing can be permitted if the harm that will be done by the product is serious and considerable. Hence statement 2 is also incorrect.
48. (b)
Engineers should hold paramount of safety, health and welfare of the public in the performance of their professional duties as engineers. Hence statement 3 is incorrect.
50. (d)
Utilitarianism ignores motivation and focuses only on consequences. This leaves many people unsatisfied. Hence statement (I) is incorrect.

