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ESE 2024 : Prelims Exam
CLASSROOM TEST SERIES

GS & ENGINEERING APTITUDE

Test 13

Section A : Standards & Quality practices in production, construction, maintenance & services
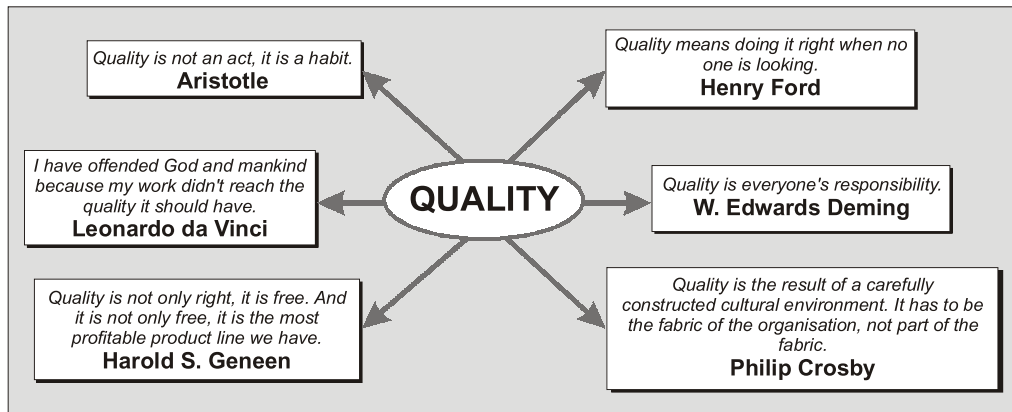**Section B :** Information and Communication Technologies
Section C : Ethics and Values in Engineering Profession

ANSWER KEY

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

DETAILED EXPLANATIONS

1.   **(c)**

2.   **(d)**

Quality control :
- It is product oriented.
- It is a corrective tool.
- It is a reactive quality process.
- Quality control means action has taken on the process on the process to execute them.
- The goal of quality control is to identify and correct the defects in the finished product.

3.   **(c)**
- JIT is not able to handle dynamic situation.
- MRP can handle dynamic situation i.e. when demand changes suddenly.

4.   **(b)**
- The concept of quality circle is given by Kaoru Ishikawa.
- Quality control circles originated in Japan, first company in Japan to introduce it was NIPPON WIRELESS and TELEGRAPH COMPANY in 1962.

5.   **(d)**

New seven tools:

| Tool Name	Utilization
Affinity diagram	Used to organize abstract thinking about a problem
Relations diagram	Used for determining causalities among parts of a problem
Systematic/Tree diagram	Planning tool
Matrix diagram (many types)	Used to organize knowledge in a matrix format; sometimes includes intercellular relationships
Matrix data analysis method	Principal components technique is performed on matrix data
Arrow diagram	Manage a complex project or task
Process Decision Program Chart (PDPC)	Determining which processes to use by evaluating events and prospective outcomes

6.   **(d)**

7.   (c)

    1.   Acceptance Quality Level: It defines the percentage of defects at which consumers are willing to accept lots as 'good'. The producers would like to design a sampling plan such that there is high probability of accepting a lot that has a defect level less than or equal to the AQL.

    In other words we can say that "AQL is the worst tolerable quality level".

    2.   Lot Tolerance Percent Defective or Rejectable Quality Level: It defines the upper limit on the percentage of defects that a consumer is willing to accept. In other way, it is the poorest level of quality that the consumer is willing to tolerate in an independent lot. The probability of accepting a lot of RQL represents a risk for the consumer. As RQL is an unacceptable quality level, the probability of acceptance for on RQL should be low.

    3.   Average Outgoing Quality (AOQ): It represents the average percentage defectives in the outgoing products after inspection including all accepted and all rejected lots.

8.   (b)

    •   **Effect of sample size n on OC curve:** As the sample size n increases the OC curve shape will become more steeper means tends to the ideal OC curve and it become more discriminating between good and bad lots.

Lot fraction defective (p)
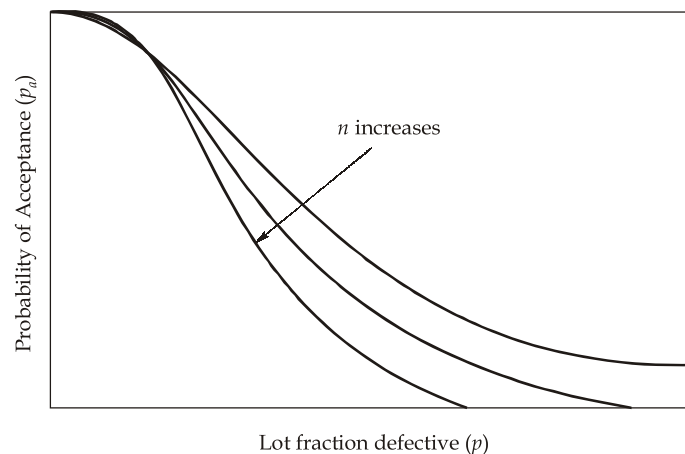
9.   (b)

    •   TQM takes the view that profits follow quality not the other way round.

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

11.   (b)

    QS-9000 is a quality management system developed by Daimler-Chrysler, Ford and General motors for suppliers of production parts, materials and services to the automotive industry.

12.   (a)

    During auditing, an auditor cannot be expected to discover deeply laid frauds.

13.   **(b)**

Analyse : Analysis is extremely important to determine relationships and the factors of causality. Analyse the system to identify ways to eliminate the gap between the current performance of the system or process and the desired goal. Apply statistical tools to guide the analysis.

14.   **(b)**

Six sigma gives a precision of 99.9997%, whereas four sigma gives a precision of 99.3790%.

15.   **(a)**

D = 15000 units/year; C_h = Rs.0.80 per unit per year; EOQ = 450 units/order

∴ Economic ordered quantity, EOQ $= \sqrt{\dfrac{2DC_0}{C_h}}$

$$450 = \sqrt{\dfrac{2 \times 15000 \times C_0}{0.80}}$$

$$C_0 = \text{Rs.}5.4/\text{order}$$

16.   **(b)**

- FNSD analysis categories inventory based on their consumption rates or movement as follows:

$$F \rightarrow \text{Fast moving items}$$
$$N \rightarrow \text{Normal moving items}$$
$$S \rightarrow \text{Slow moving items}$$
$$D \rightarrow \text{Dead items}$$

- FNSD analysis is particularly useful to combat obsolete items.

17.   **(d)**

Radiographic examination is used for volumetric examination.

18.   **(d)**

- Cobalt - 60 is usually used for thickener materials due to its greater penetrating ability.
- The most important limitations of RT is that the depth information of the flaws are not available.

19.   **(b)**

- Statement 1 is correct for subjective service quality.
- Objective service quality is the concrete measurable conformity of a working result with previous defined benefit.

21.   **(b)**

$$\text{MTTF} = \dfrac{\text{Total time}}{\text{Total number of equipments}}$$

23.   **(c)**

$$P_i = P_1 = P_2 = 0.80$$

$$\text{System reliability, } R_s(t) = 1 - \left[\left(1 - P_1\right) \times \left(1 - P_2\right)\right]$$

$$= 1 - [(1 - 0.8) \times (1 - 0.8)] = 0.96$$

$$\therefore \qquad \text{Improvement factor} \ = \ \frac{R_s(t)}{P_i} = \frac{0.96}{0.80} = 1.2$$

24. (d)

Quality assurance engineering leads to less scrap and less inspection rejects.

26. (b)

- Quantum dots are excited by the blue light from the display panel to emit pure basic colors, which reduces light losses and color crosstalk in color filters, improving display brightness and color gamut. Hence, statement 1 is incorrect.
- Quantum dots (QD) are nanoparticles/structures that exhibit 3 dimensional quantum confinement, which leads to many unique optical and transport properties. Hence, statement 2 is correct.

27. (a)

A committee headed by retired Supreme Court Judge Justice BN Srikrishna submitted its report on "Data Protection Framework" to the Government, also known as Justice Srikrishna Report.

28. (c)

eSign is an online electronic signature service which can be integrated with service delivery applications via an open API to facilitate an Aadhaar holder to digitally sign a document, thereby avoiding physical cryptographic token. It ensures the privacy of the signer by requiring that only the thumbprint (hash) of the document be submitted for signature function instead of the whole document.

29. (b)

- The clock speed / clock rate of computers is usually measured in megahertz (MHz) or gigahertz (GHz).
- An operating system manages hardware resources, including peripherals, memory, and processor time, to ensure efficient operation of the computer system.

Hence, only statement 2 is correct.

30. (a)

A logic bomb is a type of malicious code embedded in software that remains dormant until specific conditions are met. When triggered, a logic bomb virus executes a destructive action, such as deleting files or disrupting critical systems. Unlike traditional malware, a logic bomb does not propagate actively but rather lies in wait for its pre-defined activation event.

31. (c)

- Simple Mail Transfer Protocol (SMTP) is a set of communication guidelines that allow the software to transmit an electronic mail over the internet.
- It is a program used for sending messages to other computer users based on e-mail addresses.

32. (c)

A compiler is a type of software that translates a high-level programming language into machine code that can be executed by a computer.

33.   **(a)**

IPv4 address is of 32-bits and IPv6 address is of 128-bits.

34.   **(a)**

CPU is not a network device, rather a processing unit responsible for executing instructions.

35.   **(c)**

Clipboard is a section of computer memory that temporarily stores copied data especially to facilitate its movement or duplication.

36.   **(b)**

Open Government Data (OGD) Platform India has been set-up by National Informatics Centre (NIC) in compliance with the Open Data Policy whose objective is to provide a platform for proactive access to Government-owned shareable data. These datasets are directly published on the platform by the Government Departments.

37.   **(a)**

Saposhi Malware is capable of taking over electronic devices and turning them into bots which can then be used for DDoS attacks.

38.   **(c)**

Cache memory is faster than the system RAM, and is closer to the CPU because it is on the processor chip. It acts as a temporary storage area that is more readily available to the processor than the computer's main memory source i.e. RAM or ROM. Hence, Statement (II) is false.

40.   **(b)**

Micro-ethics addresses issues arising at the personal or individual level when one faces a conflict between " What are the demands of conscience and What needs to be done as per occupational requirements?". It is an ethical issue which an employee deals with.

42.   **(c)**

The idea of objectivity is having a reason that is free from personal preferences, feelings, and opinions. In general, the attribute of being free of bias is referred to as objectivity.

45.   **(a)**

Recreation facilities and share in profit of a company are not included in the ethical codes related to fair treatment of workers at workplace.

50.   **(c)**

Ethics refers as general and abstract concepts of right and wrong behavior culled from philosophy, theology, and professional societies.
A moral precept is an idea or opinion that's driven by a desire to be good. An ethical code doesn't have to be moral. It's just a set of rules for people to follow.

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