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**ESE 2025 : Prelims Exam | GS & ENGINEERING  
CLASSROOM TEST SERIES | APTITUDE**
**Test 11**
**Section A :** Information and Communication Technologies (ICT)

**Section B :** Ethics and Values in Engineering Profession

**Section C :** Basics of Project Management

**Answer Key**

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

**Section A : Information and Communication Technologies (ICT)**

1. (c)  
ICT facilitates flexible access to engineering education through digital platforms and promotes global sharing of skills, experiences, and best practices, enhancing learning and collaboration in the field.
2. (d)
  - Metropolitan Area Network (MAN) covers a larger area by connecting LANs to a larger network of computers.
  - In the Metropolitan area network, various Local area networks are connected with each other through high-speed solutions or telephone lines.
  - The size of the Metropolitan area network is larger than LANs and smaller than WANs (wide area networks); MANs covers the larger area of a city or town.
  - A television cable network is an example of a MAN because it covers a city or large area, typically up to 30-40 km.
3. (d)
  - In optical fiber communications, transponders are used to convert electrical signals to optical signals and vice versa.
  - In satellite communication, the satellite transponder receives the signal from earth station; amplifies and changes the frequency of the received signal to downlink frequency and retransmits the received signal.
4. (c)  
In star topology, all the devices are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node.
5. (d)
6. (d)
  - A virtual private network, or VPN, is an encrypted connection over the Internet from a device to a network. The encrypted connection helps to ensure that sensitive data is safely transmitted.
  - It prevents unauthorized people from eavesdropping on the traffic and allows the user to conduct work remotely. A VPN extends a corporate network through encrypted connections made over the Internet.
  - Payment networks, handling sensitive financial transactions, often utilize VPNs to protect data during transmission.
7. (c)  
TCP/IP model has four layers: Application Layer, Transport Layer, Internet Layer and Network Access Layer. The functions of session layer and presentation layer in OSI Model are performed by Application layer in TCP/IP model.

8. (c)

e-Governance is the application of Information and Communication Technologies (ICTs) for delivering government services through integration of various stand-alone systems between Government-to-Citizens (G2C), Government-to-Business (G2B), and Government-to-Government (G2G) services. It aims to streamline government processes, improve efficiency, enhance transparency, and make services more accessible to citizens.

9. (b)

- In a website, a hyperlink (or link) is an item like a word or button that points to another location.
- When you click on a hyperlink, it redirects to the target destination, which may be a webpage, document or other online content.
- Both images and text can be used to create a hyperlink.

10. (a)

A non-fungible token (NFT) is a unique digital identifier that is recorded on a blockchain and is used to certify ownership and authenticity. The ownership of an NFT is recorded in the blockchain and can be transferred by the owner, allowing NFTs to be sold and traded. NFTs typically contain references to digital files such as artworks, photos, videos, and audio.

11. (d)

- A firewall examines incoming and outgoing packets to determine whether they should be allowed or blocked based on a set of security rules.
- Firewalls use rules or filters to identify and block unauthorized or potentially harmful traffic. The “correct makings” refers to traffic that matches the firewall’s defined rules.
- Firewalls can monitor network activity and identify unauthorized outbound connections, helping to prevent data leaks or malicious activity.

12. (d)

13. (c)

- A solid-state drive (SSD) is a new generation of storage device used in computers. SSDs replace traditional mechanical hard disks by using flash-based memory, which is significantly faster and has no moving parts. SSDs speed up computers significantly due to their low read-access times and fast throughputs.
- The memory chips on an SSD are comparable to random access memory (RAM). Instead of a magnetic platter, files are saved on a grid of NAND flash cells. Each grid (also called blocks) can store between 256 KB and 4MB.

14. (d)

- Proprietary system software refers to software that is owned by a specific individual or organization and is protected by copyright. This means that the source code of the software is not freely available to the public, and users must obtain a license to use the software legally.

- Microsoft Windows is an example of proprietary system software. It is a closed-source operating system developed by Microsoft and is only available for use on devices that are licensed by Microsoft.
- Linux is an open-source software whereas Microsoft Office and Microsoft Internet Explorer are application software and not system software.

15. (a)

- An Operating System (OS) is a software that acts as an interface between computer hardware components and the user. Every computer system must have at least one operating system to run other programs. Applications like Browsers, MS Office, Notepad Games, etc., need some environment to run and perform its tasks.
- The OS helps you to communicate with the computer without knowing how to speak the computer's language. It involves allocation of resources and services, such as memory, processors, devices, and information.
- It is not possible for the user to use any computer or mobile device without having an operating system.

OS does not control CPU as such rather it controls and coordinates the use of the hardware among the various application programs for the various users. Thus, statement 2 is not correct.

16. (c)

A touchpad is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to control a pointer in a graphical user interface on a computer screen. A touchpad responds primarily to pressure and movement by sensing changes in capacitance caused by the user's finger.

17. (b)

Remote controls typically use infrared (IR) radiation to transmit signals.

18. (b)

- Codes consisting of Bars or lines of varying widths or lengths that are computer-readable are known as barcodes.
- UPC-A barcodes carry GTIN-12 numbers as defined by GS1 US. In its standard version (UPC-A), the bar code consists of a five-digit manufacturer number and a five-digit product number. In addition, there is a 1-digit number system identifier at the start of the code.
- The UPC symbol also has a check digit which is the last digit of the code to verify the integrity of the barcode data.

19. (c)

- Quantum computers harness the unique behavior of quantum physics—such as superposition, entanglement, and quantum interference—and apply it to computing.
- In quantum computing, a qubit or quantum bit is a basic unit of information. Unlike classical bits, which can be either 0 or 1, qubits can exist in a superposition of both states simultaneously.

Hence, both the statements are correct.

20. (a)

Multicasting refers to a method in computer networking where a single source sends data to multiple recipients on a network simultaneously. Hence, only statement 1 is correct.

21. (b)

22. (b)

Spyware is a type of malicious software (malware) that is installed on a computing device without the end user's knowledge. It collects information from a computing system without consent. Spyware can capture keystrokes, screenshots, authentication credentials, personal email addresses, web form data, internet usage habits, and other personal information and provide such information to software owner.

23. (b)

Creative pedagogy is a teaching approach that focuses on fostering creativity and innovative thinking in learners. The creative pedagogy teaches learners how to learn creatively and become creators of themselves and creators of their future. Digital apps such as WhiteHat Jr focuses on teaching childrens coding and programming skills using creative methods which aligns with the principles of Creative Pedagogy.

24. (b)

Holographic data storage is a potential technology in the area of high-capacity data storage currently dominated by magnetic data storage and conventional optical data storage.

25. (a)

Evolved EDGE or E-EDGE is an EDGE evolution that enables 2G EDGE upgraded networks to be able to provide performance equivalent to that of 3G networks like 3G UMTS / WCDMA. The Evolved EDGE standard allows for the use of two channels, thereby providing the possibility of doubling the throughput.

- Holographic data storage is a promising technology for high-capacity data storage, currently dominated by magnetic data storage and conventional optical data storage. While magnetic and optical data storage devices rely on individual bits being stored as distinct magnetic or optical changes on the surface of the recording medium, holographic data storage records information throughout the volume of the medium and is capable of recording multiple images in the same area utilizing light at different angles.
- Additionally, whereas magnetic and optical data storage records information a bit at a time in a linear fashion, holographic storage is capable of recording and reading millions of bits in parallel, enabling data transfer rates greater than those attained by traditional optical storage.

**Section B : Ethics and Values in Engineering Profession**

26. (a)  
The ethical codes do not concern with business interests and public image of a profession.
27. (a)  
  - Ethical subjectivism argues that what is ethically right or wrong for the individual depends on the ethical principles he/she has chosen.
  - In other words, for people who subscribe to ethical subjectivism what is ethically right or wrong is entirely a personnel matter.
28. (a)  
Normative Inquiry describes what one ought to do under a specific circumstance. This is the expected ideal response, which might differ from what one believes to be right or wrong. This list identifies and justifies the morally desirable nature for guiding individuals or groups.
29. (a)  
Engineering Ethics is the set of rules and guidelines that engineers adhere to as a moral obligation to their profession and to the world. It has objectives to study ethical dilemmas and moral obligations in engineering profession.
30. (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 deals with ethical issues which an employee face with.
31. (c)  
  - **Contractualism:** Social Agreement among a range of parties on ethical principles.
  - **Deontology:** Ethics based on the fulfilment of one's duty.
  - **Consequentialism:** Ethics based upon the nature of consequences of action.
  - **Virtue Ethics:** Emphases on the excellence of mind and character.
32. (c)
33. (d)
34. (d)
35. (d)  
  - Moral dilemmas are situations in which two or more moral obligations, duties, rights, goods, or ideals come into conflict with each other.
  - **Causes of Moral Dilemmas**
    - Problem of vagueness
    - Problem of conflicting reasons
    - Problem of disagreement

36. (a)

- Values mean an in-built mechanism which distinguishes the right from the wrong. These are something we qualify as good and are prepared to set as our goals in life.
- Human value relating to an individual which when considered carefully, can be related primarily to the concerned person.

37. (d)

Moral autonomy is the ability to think critically and independently about moral issues and to apply this moral thinking to situations that arise in the course of professional situations.

38. (c)

### Section C : Basics of Project Management

39. (b)

$$t_{e_{1-2}} = 4 \text{ days}; \quad t_{e_{2-4}} = 2 \text{ days}$$

$$t_{e_{2-3}} = 4 \text{ days}; \quad t_{e_{4-5}} = 5 \text{ days}$$

$$t_{e_{3-5}} = \frac{13}{3} \text{ days}$$

∴ 1 - 2 - 3 - 5 is critical path

$$\sigma_1 = \frac{5-3}{6} = \frac{1}{3}$$

$$\sigma_2 = \frac{6-2}{6} = \frac{2}{3}$$

$$\sigma_3 = \frac{7-3}{6} = \frac{2}{3}$$

$$\Rightarrow \sigma = \sqrt{\frac{1}{9} + \frac{4}{9} + \frac{4}{9}} = 1$$

40. (a)

When the ratio goes below 1 than project is unacceptable.

41. (b)

For mass construction, LOB may show the volume of work required to be completed at important stages to meet a contractor's commitment to the owner.

42. (c)

Statements 1 and 3 belong to operation and not a project.

43. (d)

Expert and Reward are best forms of power according to PMI. The worst is penalty.

44. (a)

Steps used in Demand forecast :

1. Determine the use of forecast
2. Select the item to be forecast

3. Determine the time horizon of the forecast
4. Select forecasting method
5. Gather data
6. Make forecast
7. Validate and implement results

45. (d)

Statement (I) is false but Statement (II) is true. If forecast are repeatedly overestimates, bias will have a positive value.

For a very accurate forecast, both MAD and bias will be zero. It is preferable to choose a method of forecasting wherein MAD can be controlled and brought nearer to zero.

46. (b)

$$\text{Unit cost} = \frac{A + 4B + C}{6}$$

47. (a)

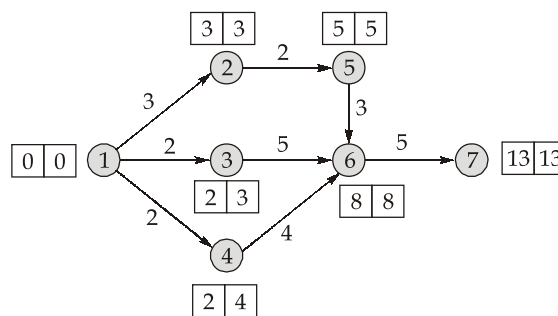
$$\text{DRC} = \frac{\text{Value added at domestic price}}{\text{Value added at world price}} \times \text{Exchange rate}$$

$$\text{DRC} = \frac{100}{150} \times 90 = ₹60$$

48. (b)

The break even chart is a tool for short run analysis which is limitation of break even chart.

49. (a)



$$\text{Critical path} = 1 - 2 - 5 - 6 - 7$$

$$\text{Project duration, } t_e = 3 + 2 + 3 + 5 = 13 \text{ days}$$

$$\text{Free float (3 - 6)} = T_f - S_i = 8 - 2 - 5 - 0 = 1 \text{ day}$$

50. (d)

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