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ESE 2025 : Prelims Exam
CLASSROOM TEST SERIES

GS & ENGINEERING
APTITUDE

Test 9

Section A : Ethics and Values in Engineering Profession [All Topics]

Section B : Basics of Project Management [All Topics]

Section C : General Principles of Design, Drawing, Importance of Safety [All Topics]

Answer Key

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

Q.41: Answer key has been updated.

Section A : Ethics and Values in Engineering Profession

1. (a)
 - Responsibility includes accountability, obligation and duty.
 - Respect includes tolerance, self-respect and respect for others.
2. (c)
3. (b)

Engineers must consider the safety, health, and welfare of the public as a primary responsibility when making decisions.
4. (a)

Pleasure, security and efficiency are the values that motivate a perpetrator to do an unethical act.
5. (c)

Falsifying data is unethical and can lead to serious consequences, including harm to the public.
6. (d)
7. (c)
 - Value issue refers as a situation where values are a central focus.
 - Ethical issue occurs with problem involving moral principles, and norms.
 - Value conflict refers as a situation where alternative solutions to a dilemma are primarily value based, with the values in opposition to each other.
 - Ethical dilemma is a value conflict in which one or more of alternative involve moral and/or professional wrongdoing.
8. (b)
 - **Moral communication:** Precision in the use of a common ethical language.
 - **Moral reasonableness:** The willingness and ability to be morally reasonable.
 - **Moral hope:** Enriched appreciation of the possibilities of using rational dialogue in resolving moral conflicts.
 - **Moral coherence:** Forming consistent and comprehensive viewpoints based on consideration of relevant facts.
9. (c)

A conflict of interest arises when an engineer's personal interests influence their professional decisions.
10. (c)

Integrity involves being truthful, transparent, and fair in all professional relationships.
11. (d)
12. (c)

13. (d)
14. (b)
Competence ensures that engineers are qualified to perform their work and uphold public safety.
15. (d)
Codes of ethics has many essential roles which include providing guidance, supporting sincere professionals, serving and protecting public and offering inspiration.
16. (a)
Tragedy of Commons is a term developed by Garrett Hardin to discuss the decay of natural resources that are in public domain. It is that rational decision making by individuals which may not represent rational decisions of society.
17. (d)
- An intrinsic value is one which has worth in its own right. Truth, beauty, goodness, temperance, courage, etc. are considered as intrinsic values. They are good not because of their consequences but because they are good in themselves.
 - An extrinsic value is one which is mean to some other value. It is of instrumental worth only. Wealth, fame, physical fitness, etc. borrow their worth from something not related to them.
18. (a)
Sharing confidential information with a competitor is unethical and can breach professional trust and confidentiality.
19. (c)
- Emotional quotient (EQ), also called emotional intelligence quotient, is a measurement of a person's ability to monitor his/her emotions, to cope with pressures and demands, and to control his or her thoughts and actions.
 - It is an indicator of the formation, maintenance and enrichment of both personal and professional relationships.
20. (b)
Sustainability focuses on minimizing harm to the environment and society while maximizing long-term benefits.
21. (b)
22. (d)
23. (a)
24. (c)
25. (b)

Section B : Basics of Project Management

26. (a)

The project lifecycle format is a special management technique subdividing the project into a number of identifiable phases that each produce a distinct deliverable.

This sequence of phases forms the backbone of the project methodology.

27. (d)

28. (a)

The PPP (Public Private Partnership) falls into a category where a company is given licence to finance, build and operate a facility (for example a toll road).

29. (c)

30. (d)

A → 1 ⇒ Better technical control is possible as all projects will benefit from the most advanced technology

B → 2 ⇒ Very rapid reaction time as each project has a particular head and most of the power resides with them.

C → 3 ⇒ Authority and responsibilities are shared specially in balanced matrix.

31. (c)

$$\text{Selling price per unit} = \frac{100000}{8000} = ₹12.5$$

$$\begin{aligned} \text{Variable cost (for 8000 units)} &= \text{Total cost} - \text{Fixed cost} \\ &= ₹80000 - ₹30000 \\ &= ₹50000 \end{aligned}$$

$$\text{Variable cost per unit} = \frac{50000}{8000} = ₹6.5$$

$$\begin{aligned} \text{BEP (in terms of unit)} &= \frac{\text{Fixed cost}}{(\text{Selling price per unit} - \text{Variable cost per unit})} \\ &= \frac{30000}{12.5 - 6.25} = 4800 \text{ units} \end{aligned}$$

32. (b)

Let x be number of units for achieving a profit of ₹25000.

$$\begin{aligned} \text{Profit} &= \text{Sales} - \text{Total cost} \\ &= \text{Sales} - (\text{Fixed cost} + \text{VC}) \\ &= 12.5x - (30000 + 6.25x) \\ 25000 &= 6.25x - 30000 \\ x &= 8800 \text{ units} \end{aligned}$$

33. (d)

No such method is used for demand forecasting.

34. (a)
If two competing projects are being considered, the one expected to yield the highest NPV should be selected.
35. (b)
Total cost of production = Cost of production + Total administrative expenses
+ Total sales expenses + Royalty
36. (c)
Treasury bill are sold at a discount if sold before maturity.
37. (a)

$$Z = \text{Probability factor or Normal deviate} = -2$$
 Corresponding to P% = 2.28%

$$\mu_T = 60 \text{ Weeks}$$

$$\sigma_T = \sqrt{V_T} = \sqrt{9} = 3 \text{ Weeks}$$

$$Z = \frac{x - \mu_T}{\sigma_T}$$

$$-2 = \frac{x - 60}{3}$$

$$x = 54 \text{ Weeks}$$
38. (d)
Sensitivity analysis indicates how vulnerable a project is.
If sales or investment deviates from its expected value then sensitivity analysis is done.

Section C : General Principles of Design, Drawing, Importance of Safety

39. (c)
Horizontal reference lines : The intersecting line of H.P. and V.P. is called horizontal reference line or reference line.
Vertical reference line : The V.P., H.P. and side planes intersect along lines which are known as vertical reference lines.
40. (a)
When the line is placed spatially in such a way that it is inclined both H.P. and V.P. than the front and top view of the line do not represent the true length but appear with reduced length and the apparent angles value are more than the true inclination of the line with H.P. and V.P.
41. (a)*
42. (d)
As the true shape of the section is a hexagon, the S.P. must cut the cube at 6 points i.e., the S.P. will cut 2 edges of the top, two edges of the base and two vertical edges. If the true shape is a regular hexagon, S.P. should cut these 6 edges at mid points.

43. (b)

44. (d)

- **Superior trochoid** : It is the curve traced by a point fixed to a circle outside its circumference, as the circle rolls without slipping along a straight line.
- **Epicycloids** : It is a curve traced by a point on the circumference of a circle which rolls without slipping on the outside of another circle.
- **Hypocycloids** : It is a curve traced by a point on the circumference of a circle which rolls without slipping on the inside of another circle.

45. (b)

When a cone is cut by a section plane, parallel to an end generator, the section produced is a parabola. Size of parabola depends on the position of section plane.

46. (b)

47. (b)

Deluge system brings a large number of open sprayers into action simultaneously in the event of fire.

48. (c)

49. (c)

50. (d)

