



ACE

Engineering Academy

TEST ID: 611

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ESE- 2019 (Prelims) - Offline Test Series

Test-21

GENERAL STUDIES AND ENGINEERING APTITUDE

FULL LENGTH MOCK TEST- 1 (PAPER- I) SOLUTIONS

01. Ans: (d)

02. Ans: (c)

03. Ans: (b)

Sol: A party registered under the Representation of People's act, 1951 and securing not less than one percent of the votes polled in the preceding election is entitled to receive the electoral bonds. Electoral Bonds may be purchased by only citizen of India. The bonds can only be encashed by an eligible political party only through a bank account with the authorized bank. Electoral Bonds are valid for fifteen calendar days.

04. Ans: (c)

Sol:

INDIA			
11 biosphere reserves	Niligiri	2000	2012
	Gulf of Mannar	2001	2013
	Sunderban	2001	2013
	Nanda Devi	2004	
	Nokrek	2009	
	Pachmarhi	2009	
	Similipal	2009	
	Achanakmar-Amarkantak	2012	
	Great Nicobar	2013	
	Agasthyamala	2016	
	Khangchendzonga	2018	



05. Ans: (b)

Sol: Lighting a Billion Lives: is a global initiative to facilitate clean energy access and the delivery of last mile energy services for basic and productive use. The initiative enables energy poor communities to transition from traditional and inefficient energy sources to modern, more efficient and sustainable energy solutions. Operating through an entrepreneurial model of energy service delivery, Lighting a Billion Lives accelerates market development for clean energy technologies through knowledge sharing, capacity building and market seeding.

LaBL (Lighting a Billion Lives) and Green Olympiad are also organized by TERI. Green Rating for Integrated habitat (GRIHA) is a national rating system for green buildings in India conceived by TERI. The institute also releases a plethora of publications like Terra Green and TEDDY.

06. Ans: (c)

Sol: The concept of Comprehensive Environmental Pollution Index (CEPI) was evolved by Central Pollution control Board (CPCB) during 2009-10 as a tool for comprehensive environmental assessment of prominent industrial clusters and formulation of remedial Action Plans for the identified critically polluted area. Later-on proposals were received from the SPCBs, State Governments, and Industrial Associations and concerned Stake holder for revisiting the criteria of assessment under CEPI concept. After careful examination and consideration of the suggestions of concerned stake-holder, it was decided to prepare the revised concept of CEPI by eliminating the subjective factors but retaining the factors which can be measured precisely.

Issues raised by different stake-holders were addressed appropriately and final document on 'Revised CEPI version 2016' has been evolved retaining the existing algorithm of Source, Pathway and Receptor.

07. Ans: (d)

08. Ans: (c)

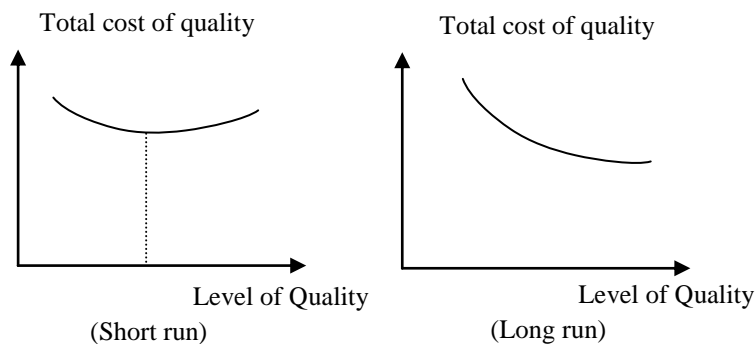
Sol: National Solar Mission,
National Mission on Enhanced Energy Efficiency.
National Mission on Sustainable Habitat,



National Water Mission, National Mission for Sustaining the Himalayan Eco-system,
National Mission for a Green India,
National Mission for Sustainable Agriculture and
National Mission on Strategic Knowledge for Climate Change.

09. Ans: (a)

Sol: Hidden costs are costs which are difficult to estimate.



10. Ans: (c)

Sol: While each of the options is a challenge, the biggest challenge is dealing with resistance to change. Many projects failed due to inability in dealing with resistance.

11. Ans: (a)

Sol: Fish bone diagram also called cause and effect diagram was developed by Ishikawa to identify all possible causes of a problem.

12. Ans: (c)

Sol: The SWAYAM PRABHA is a group of 32 DTH channels devoted to telecasting of high quality educational programmes on 24×7 basing using GSAT-15 satellite.

The vision of Antoyodaya-SARAL is unified platform to deliver and track G2C schemes across the state and it provides live tracking of status of service requests.



13. Ans: (c)

Sol: Leased connection is also known as direct internet access or level three connection it is secure, dedicated and most expensive level of internet connection, with leased connection computer is dedicatedly and directly connected to the internet using high speed transmission lines.

14. Ans: (d)

Sol: MHRD has formed e-shodh sindhu merging three consortia.

1. UGC-INFONET digital library consortium
2. NLIST(National Library and Information Services Infrastructure for Scholarly content)
3. INDEST-AICTE(Indian National Digital Library in Engineering Science and Technology)

15. Ans: (a)

Sol: To reduce, the project duration, we need to crash critical path only. Minimum cost slope critical activity must be chosen for crashing purpose.

16. Ans: (c)

Sol: Project duration distribution = $\mu \pm 3\sigma$

where μ = Critical Path duration

$$\sigma = \sigma_{cp}$$

Maximum variance critical path will decide the project duration distribution.

17. Ans: (a)

18. Ans: (c)

19. Ans: (b)

Sol:

- Castiron is used in machine beds because of high damping capacity and that can absorb vibrations in short period of time.
- Castiron has higher compressive strength.
- Castiron has low ductility (or) low plastic deformation.

20. Ans: (a)



21. Ans: (a)

Sol: The vertical plane and horizontal plane are perpendicular planes intersected at reference line. So, on paper to represent perpendicular planes any of the planes should arrange to get real picture of required projection.

22. Ans: (d)

Sol: As with knowledge of views we can say the views from different sides and next if a line is perpendicular to one plane of projection planes it will parallel to other planes. Given one end is on vertical plane so the other end can't be on perpendicular plane.

23. Ans: (c)

Sol: Modular Design helps the design team in standardizing the functional requirements for a variety of products which can sometimes lead to product families and also reducing product development time.

24. Ans: (b)

Sol: Statements 1, 2 and 3 are correct: Drawings are universal language of design. They are used to communicate between the designers themselves, between the designers and manufacturers and between the designers and customers (sometimes Decision Makers). This communication helps the design team to gain the confidence of customers (or Decision Makers) or to build the product effectively.

Obscurity means ambiguity or complexity. Drawings decrease the ambiguity or complexity in design and manufacturing of the product.

25. Ans: (d)

Sol: Here the motor is designed to meet specific Customer request. So as per the definitions of types of Design:

Redesign – Fix → To Modify the design based on Customer complaints on the product.

Redesign – Update → To Modify the design based on Customer feedback to improve the product.

New Product Design → To Build a new design from scratch.

Adaptive Design → To Modify the design to adapt to a particular customer request.



26. Ans: (a)

Sol: Let CP = Rs. 3

$$SP = \text{Rs. } 4$$

Now, SP = 75% of MP [because discount 75%]

$$\text{i.e. Rs. } 4 = \frac{3}{4}(\text{MP})$$

$$\text{MP} = \text{Rs. } \frac{16}{3} \text{ or } 5\frac{1}{3}$$

$$\text{Now, MP} = \text{Rs. } 5\frac{1}{3}$$

$$\text{CP} = \text{Rs. } 3$$

$$\text{more\%} = \frac{2\frac{1}{3}}{(3)} \times 100 = 77\frac{7}{9}\%$$

27. Ans: (c)

Sol: Let new no. of boys and girls be $3x$ and $5x$ respectively.

According to 1st option, $5x - 3x = 1$ [$31 - 30 = 1$]

1st option is not the answer, as $x = 0.5$ which is not an integer.

According to 2nd option, $5x - 3x = 21$ [$51 - 30 = 21$]

x is not an integer. Not the answer

According to 3rd option, $5x - 3x = 22$ [$52 - 30 = 22$]

$x = 11$ an integer

28. Ans: (d)

Sol: Work of first pipe for 3 hours (i.e. from 8 to 11 a.m.) = $\frac{1}{15} \times 3 = \frac{1}{5}$

Work of second pipe for 2 hours (i.e. from 9 to 11 a.m.) = $\frac{1}{12} \times 2 = \frac{1}{6}$

$$\text{Tank filled till 11 a.m.} = \frac{1}{5} + \frac{1}{6} = \frac{11}{30}$$



$$\text{Work of the three pipes for one hour each} = \frac{1}{15} + \frac{1}{12} - \frac{1}{4} = \frac{4+5-15}{60} = \frac{-6}{60} = \frac{-1}{10}$$

$$\therefore \frac{11}{30} \text{ part of the tank is emptied in } \frac{\frac{11}{30}}{\frac{-1}{10}} = \frac{11}{30} \times \frac{10}{1} = \frac{11}{3} = 3\frac{2}{3} = 3 \text{ hours } 40 \text{ minutes}$$

$$\therefore \text{Required time} = 11 \text{ a.m.} + 3 \text{ hours } 40 \text{ minutes} = 2 : 40 \text{ p.m.}$$

29. Ans: (d)

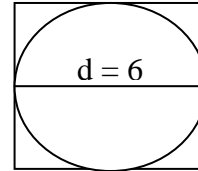
Sol: Area of the square = $10 \times 10 = 100 \text{ sq.cm}$

Minimum area of the square that can encompass the coin = 6^2 or 36 sq.cm

Side of the square = 6 cm

\therefore min. area of the square = 36 sq. cm

Hence, the required probability = $\frac{36}{100}$ or 0.36



30. Ans: (d)

Sol: Let r be the radius of the sphere, then surface area of sphere = $4\pi r^2$

Surface area of sphere = $4\pi r^2$

Total surface area of 4 pieces = $4\pi r^2 + 4(\pi r^2) = 8\pi r^2$

Since new surface area is 2 times the original surface area, so the required paint would also be twice the original requirement, i.e. 4 lit.

Hint: When you divide a sphere into 4 parts, there will be 4 new circular surface areas.

31. Ans: (c)

Sol: $z = 1$ is a pole of order 2.

$$\begin{aligned} \text{Res}_{z=1} f(z) &= \lim_{z \rightarrow 1} \frac{d}{dz} \left\{ (z-1)^2 \frac{16z}{(z+3)(z-1)^2} \right\} \\ &= \lim_{z \rightarrow 1} \left\{ \frac{16(z+3) - 16z}{(z+3)^2} \right\} = \frac{16(4) - 16}{(1+3)^2} \\ &= 3 \end{aligned}$$



32. Ans: (d)

Sol: Given that $\int_0^{2\pi} |x \sin x| dx = k\pi$

$$\Rightarrow \int_0^{2\pi} x |\sin x| dx = k\pi$$

$$\Rightarrow \pi \int_0^{2\pi} |\sin x| dx = k\pi$$

$$\left(\because \int_0^a x f(x) dx = \frac{a}{2} \int_0^a f(x) dx \text{ if } f(a-x) = f(x) \right)$$

$$\Rightarrow 2\pi \int_0^{\pi} |\sin x| dx = k\pi$$

$$\left[\because \int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx \text{ if } f(2a-x) = f(x) \right] \Rightarrow 2\pi \int_0^{\pi} \sin x dx = k\pi$$

$$\Rightarrow 2\pi [-\cos x]_0^{\pi} = k\pi$$

$$\Rightarrow 2\pi [-\cos \pi + \cos 0] = k\pi$$

$$\Rightarrow 4\pi = k\pi$$

$$\therefore k = 4$$

33. Ans: (b)

Sol: Using Gauss-divergence theorem

$$\frac{1}{\pi} \iiint_s (9xi - 3yj) \cdot nds = \frac{1}{\pi} \iiint_v \text{div} [9xi - 3yj] dv$$

$$= \frac{1}{\pi} \iiint_v (9 - 3) dx dy dz$$

$$= \frac{6}{\pi} \times \text{volume of the sphere}$$

$$= \frac{6}{\pi} \times \frac{4}{3} \times \pi (3)^3$$

$$= 216$$



34. Ans: (a)

Sol: Total Probability = $\sum_{x=1}^{\infty} P(X = x) = 1$

$$\Rightarrow \sum_{x=1}^{\infty} K(1-\beta)^{x-1} = 1$$

$$\Rightarrow K(1 + (1-\beta) + (1-\beta)^2 + \dots \infty) = 1$$

$$\Rightarrow \frac{K}{1-(1-\beta)} = 1$$

$$\Rightarrow K = \beta$$

35. Ans: (b)

Sol: $m^2 - 1 = 0 \Rightarrow m = \pm 1$

$$y = c_1 e^x + c_2 e^{-x}$$

$$\text{at } x = 0, y = 0 \Rightarrow c_1 + c_2 = 0$$

$$\text{at } x = 0, y' = c_1 - c_2 = -2$$

$$\Rightarrow c_1 = -1, \quad c_2 = 1$$

$$y = -e^x + e^{-x}$$

36. Ans: (c)

Sol: Engineering is a highly knowledge and skill demanding profession and engineers shall not associate with non-engineers for any engineering related works.

37. Ans: (c)

38. Marks to all.

In this question find the *incorrect* statement instead of *correct* statement.

The *incorrect* statement is option (c). Patent holders have the right to decide whom to sell or who can benefit from the innovation.

All the students will get '2' marks here.



39. Ans: (c)

Sol: On September 27, the National Tourism Awards for 2016-17 were presented by Union Tourism Minister K J Alphons in New Delhi as India celebrated the 2018 World Tourism Day (WTD). Ahmedabad and Mandu were jointly declared as the 'Best Heritage City'. Gujarat won three major National Tourism Awards for the Best Civic Management (at Saputara Hill Station), Best Heritage City and the Best Airport-Ahmedabad.

40. Ans: (d)

41. Ans: (b)

42. Ans: (b)

43. Ans: (c)

44. Ans: (d)

Sol: Energy sector is the largest producer of CO₂ and next comes the transport sector.

45. Ans: (a)

Sol: National Bio-Energy Mission

The government is preparing a national bio-energy mission to boost power generation from biomass, a renewable energy source abundantly available in India.

The national mission will aim at improving energy efficiency in traditional biomass consuming industries, seek to develop a bio-energy city project and provide logistics support to biomass processing units.

It will also propose a GIS-based National Biomass Resource Atlas to map potential biomass regions in the country. According to estimates, biomass from agro and agro-industrial residue can potentially generate 25,000 MW of power in India.

The Bio Energy Mission will:

Aim at improving energy efficiency in traditional biomass consuming industries.

Seek to develop a bio-energy city project.

Provide logistics support to biomass processing units.

It will also propose a GIS-based National Biomass Resource Atlas to map potential biomass regions in the country.



46. Ans: (c)

Sol: Motivating the worker is a solution which looks simple but not so. Using error proofing techniques like POKA-TOKE reduces the extent of dependence on human attention. Worker can be made attentive with the help of techniques like job rotation.

47. Ans: (d)

Sol: For survival in the marketplace, the traditional benchmark like customer specification must be supplemented by measuring quality relative to competition.

48. Ans: (d)

Sol: Of all the ingredients for successfully achieving quality superiority active leadership by upper management (top down approach) stands out.

49. Ans: (d)

Sol: QFD involves cross functional team to develop design. Marketing team will capture voice of customer, whereas engineering personnel also lend their voice.

50. Ans: (d)

Sol: Electronic components have less shelf life. Therefore, high rate of depreciation is suited for them. Straight line method uses uniform rate of depreciation. So, it is not suitable.

51. Ans: (d)

Sol: Bluetooth is not same as wimax (World Wide Interoperability Microwave Access). Wimax is same as wifi but over larger distance.

Bluetooth uses radio frequency but not infrared.



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52. Ans: (d)

Sol: If the system has unique solution, then determinant of coefficient matrix is 0,

$$\Rightarrow \begin{vmatrix} 1 & -k & 1 \\ k & 3 & -k \\ 3 & 1 & -1 \end{vmatrix} \neq 0$$

$$\Rightarrow (-3 + k) + k(2k) + (k - 9) \neq 0$$

$$\Rightarrow 2k^2 + 2k - 12 \neq 0$$

$$\Rightarrow k^2 + k - 6 \neq 0$$

$$\Rightarrow k \neq 2 \text{ and } k \neq -3$$

53. Ans: (b)

Sol: Probability for getting 4 = $\frac{1}{12}$

$$\text{Probability for getting 8} = \frac{5}{36}$$

$$P(\text{sum is 4 or 8}) = \frac{1}{12} + \frac{5}{36} = \frac{2}{9}$$

$$P(\text{sum is neither 4 nor 8}) = \frac{7}{9}$$

$$P(\text{getting sum 4 before 8}) = \frac{1}{12} + \frac{7}{9} \left(\frac{1}{12} \right) + \left(\frac{7}{9} \right)^2 \frac{1}{12} + \dots$$

$$= \frac{1}{12} \left\{ 1 + \frac{7}{9} + \left(\frac{7}{9} \right)^2 + \left(\frac{7}{9} \right)^3 + \dots \right\}$$

$$= \frac{1}{12} \left(\frac{1}{1 - \frac{7}{9}} \right) = \frac{3}{8}$$



54. Ans: (b)

Sol: Given that $\vec{f} = x^2 \vec{i} + (x - y)\vec{j} + (y + z)\vec{k}$ along a straight line AB.

$$\text{Now, work done} = \int_c \vec{f} \cdot d\vec{r} = \int_A^B \vec{f} \cdot d\vec{r}$$

$$\Rightarrow \text{work done} = \int_{(1,0,1)}^{(2,1,2)} [x^2 dx + (x - y)dy + (y + z)dz] \dots\dots\dots (1)$$

The equation of straight line AB joining the points A and B is $\frac{x-1}{2-1} = \frac{y-0}{1-0} = \frac{z-1}{2-1}$.

$$\Rightarrow x - 1 = y = z - 1$$

$$\Rightarrow x = 1 + y, y = y, z = 1 + y \text{ and } dx = dy, dz = dy \dots\dots\dots (2)$$

Using (2), (1) becomes

$$\text{Work done} = \int_{y=0}^1 [(y+1)^2 dy + (1+y-y)dy + (y+1+y)dy]$$

$$\Rightarrow \text{Work done} = \int_{y=0}^1 [(1+y)^2 + 2 + 2y] dy$$

$$\Rightarrow \text{Work done} = \left[\frac{(1+y)^3}{3} + 2y + y^2 \right]_0^1$$

$$\therefore \text{Work done} = \frac{16}{3}$$

55. Ans: (c)

Sol: Let $f(x) = x^3 - 5x - 1 = 0$ in $[a, b] = [2, 3]$ and $\epsilon = 10^{-3} = \frac{1}{1000} = 0.001$

If an accuracy ' ϵ ' for the root is given then the number of iterations required to achieve this

accuracy is given by $\left| \frac{b-a}{2^n} \right| \leq \epsilon$.

$$\Rightarrow n \geq \log_2 \left| \frac{b-a}{\epsilon} \right|$$



$$\Rightarrow n \geq \log_2 \left| \frac{3-2}{10^{-3}} \right| = \log_2 |10^3|$$

$$\Rightarrow n \geq 3 \log_2^{10} = 3 \left(\frac{2.3025}{0.6931} \right) = 3(3.3220) = 9.96$$

$$\therefore n = 10$$

56. Ans: (b)

Sol: Given that $\frac{dy}{dx} = -2xy$ (1)

with $y(0) = 2$ (2)

$$\Rightarrow \frac{dy}{y} = -2x \, dx$$

$$\Rightarrow \int \frac{1}{y} \, dy = \int -2x \, dx + c$$

$$\Rightarrow \log y = -x^2 + c$$

\therefore The general solution of (1) is

$$y = e^{-x^2 + c} \quad \text{..... (3)}$$

Using (2), (3) becomes

$$2 = e^c$$

$$\Rightarrow c = \log 2 \quad \text{.....(4)}$$

Using (4), (3) becomes

$$y = e^{-x^2 + \log 2} = 2e^{-x^2} \text{ which is a required solution of (1)}$$

57. Ans: (d)

Sol: Tool of model technology such as ICT can be used to transform relationship of the government with its constituents, citizens, business and also between its own agencies.

Hence, all statements are true.



58. Ans: (a)

Sol: The dielectric constant of an insulator is independent of applied current density (J) and applied electric field (E).

59. Ans: (d)

Sol:

- In paramagnetic material, the magnetic dipoles are randomly oriented and minor number of dipoles are aligned and hence susceptibility is positive but very small.
- These materials follows curie's law $\left(\chi_m = \frac{C}{T}\right)$

Ex: Atoms possessing odd number of electrons

Ionic materials like NaCl, KCl

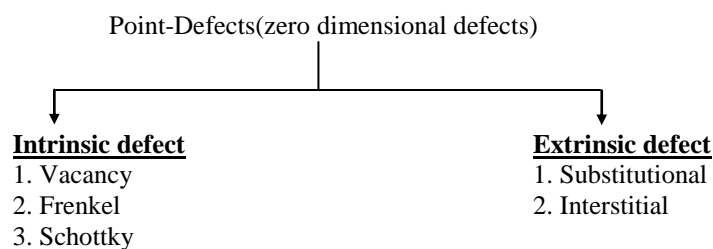
60. Ans: (d)

Sol: Based on Weiss-Domain theory, Magnetization of material is due to

1. Enlargement of Domain [reversible at low field]
2. Rotation of dipoles in a domain

61. Ans: (d)

Sol:



62. Ans: (b)

63. Ans: (b)

Sol: The general procedure involves finding R.F. at the 1st and next max length of scale and then dividing whole line into given number of units at last dividing the 1st part to number of sub-divisions that occur in unit.



64. Ans: (a)

Sol: When a line is inclined to HP and Parallel to VP, its true length appears in elevation. The elevation for both I and II quadrant it will be above the reference line.

65. Ans: (a)

Sol: If a line is inclined to HP and parallel to the VP, it will have only HT (Horizontal Trace).

66. Ans: (c)

Sol: As non-parallel sides are made two times, parallel sides also become 2 times.

$$\text{Let, original Area} = \frac{1}{2} \times h \times (a + b)$$

$$\text{Then, new Area} = \frac{1}{2} \times 2h \times (2a + 2b) \Rightarrow 2h(a + b)$$

\therefore New area is 4 times of original area

[a & b are parallel sides, $\frac{1}{2} \times h \times (a + b)$ in the formula to find area of a trapezium].

67. Ans: (d)

Sol: New speed = $\frac{1}{7}$ of actual speed

\therefore actual speed = 7 (new speed)

$$= 7 \left(\frac{35}{2} \right) = 122.5 \text{ km / hr}$$

68. Ans: (d)

Sol: Let their ages 5 year hence be 5x & x respectively

Then, $5x - x = 24$ year [age difference is 24 year given]

$x = 6$ year

\therefore Present age of Mohan = $6 - 5 = 1$ year



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69. Ans: (c)

Sol: $A = 2B$

$$B = 4.5 C$$

$$C = \frac{1}{2}(D) \text{ or } D = 2C$$

$$D = \frac{1}{2}(E) \text{ or } E = 2D$$

$$A > E > C$$

From given conditions, $E = 2D$ or $4C$

$$\therefore A > B > E > D > C$$

\therefore C is the lightest in weight.

70. Ans: (c)

Sol: 65% of total expenditure = Rs. 3120

$$\therefore \text{Total expenditure} = \frac{3120 \times 100}{65} = 4800$$

Now, 60% of salary = 4800

40% of salary = ?

$$\frac{4800}{60} \times 40 = 3200$$

\therefore His savings are Rs. 3200

71. Ans: (c)

Sol: Definition of ethics suggests only exercise of the alternative moral choices available in the interest of the ethical community but do not provide any exact conclusions about the intended action.

72. Ans: (a)

Sol: Authority a formal power which binds persons in position to serve and guide public.

73. Ans: (d)

Sol: All the above situations lead to ethical dilemma in the employees.



74. Ans: (a)

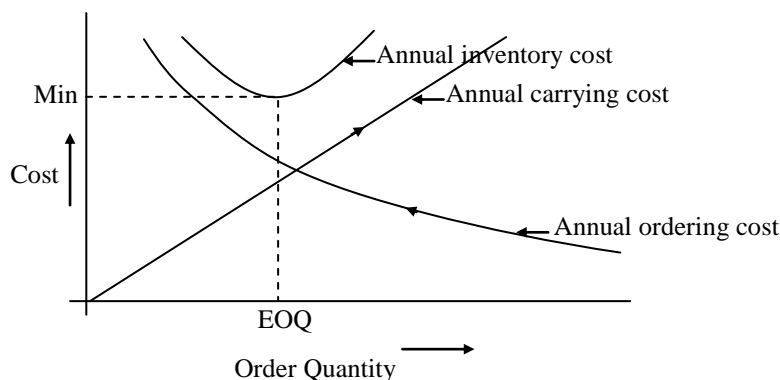
Sol: The primary goal of professional code of ethics is to protect the public from intentional or unintentional side effects of professional practice.

75. Ans: (a)

Sol: Direct conflict of interest is making a personally beneficial deal, compromising on the professional responsibilities. Option (b) is called apparent conflict of interest, though professionally charging higher fees is acceptable. Option (c) is just an unethical practice that lacks professionalism. Therefore, option (a) is the correct answer.

76. Ans: (d)

Sol:



77. Ans: (c)

78. Ans: (d)

79. Ans: (b)

80. Ans: (b)

Sol: In order to utilise and harness the benefits of Cloud Computing, Government of India has embarked upon an ambitious initiative - “GI Cloud” which has been named as ‘MeghRaj’.

Hence, the statement 1 and 2 are true while the statement 3 is not related with MEGHRAJ.



81. Ans: (a)

Sol: India's soil biodiversity is in grave peril, according to the Global Soil Biodiversity Atlas prepared by the World Wide Fund for Nature.

The WWF's 'risk index' for the globe — indicating threats from loss of above-ground diversity, pollution and nutrient over-loading, over-grazing, intensive agriculture, fire, soil erosion, desertification and climate change — shows India among countries whose soil biodiversity faces the highest level of risk. Coloured red on the Atlas, these include Pakistan, China, several countries in Africa and Europe, and most of North America.

A key aspect of this year's report is the threat to soil biodiversity and pollinators [such as bees].

82. Ans: (a)

Sol: The aims and objectives of Project UNNATI of the Ministry of Shipping are as follows:

- Benchmark operational and financial performance of the 12 major ports with selected Indian private ports and best-in-class international ports for identifying improvement areas.
- Undertake capability maturity assessment for key processes and functional capabilities (e.g., IT, HR, Environment, and Health) and identify gaps and areas for further strengthening.
- Detailed deep-dive diagnosis and root cause analysis for the identified opportunity areas in each of the 12 major ports to understand underlying reasons for performance bottlenecks.
- Develop practical and actionable solutions on the basis of root cause findings, and develop a comprehensive improvement roadmap for each of the 12 major ports.

83. Ans: (a)

Sol: There are some testing methods which use destruction methods. Therefore, it doesn't make sense to go for 100% inspection.

84. Ans: (a)

Sol: Ideal OC curve is obtained when ideal sample is taken which has zero sampling errors. Therefore, OC curve is rectangle.



85. Ans: (c)

Sol: The iron-carbon alloys are interstitial solid solutions i.e., the carbon atom occupies at the interstitial spaces of iron because of small radius of carbon atom than iron atom.

86. Ans: (c)

Sol: Thermo plastic polymers are formed by linear polymerization and there are rigid at low temperature but soft and mouldable at elevated temperature.

87. Ans: (c)

Sol: The fundamental objective of all the occupations is to serve other's purpose and make a living through service.

88. Ans: (a)

89. Ans: (b)

Sol: Peatlands and climate change

- Peatlands are a type of wetlands which are among the most valuable ecosystems on Earth:
- They are critical for preserving global biodiversity,
- Provide safe drinking water
- Minimise flood risk and help address climate change.
- Peatlands are the largest natural terrestrial carbon store; the area covered by near natural peatland world wide ($> \text{million km}^2$) sequesters 0.37 gigatonnes of carbon dioxide (CO_2) a year –storing more carbon than all other vegetation types in the world combined.
- Damaged peatlands are a major source of greenhouse gas emissions, annually releasing almost 6% of global anthropogenic CO_2 emissions. Peatland restoration can therefore bring significant emissions reductions.
- Countries are encouraged to include peatland restoration in their commitments to global international agreements, including the Paris Agreement on climate change.



90. Ans: (b)

Sol: Human induced activities are leading to the raise in global temperatures. Popularly known as global warming. As it is leading to raise in heat wave temperature.

91. Ans: (c)

Sol: Haze:

Haze is traditionally an atmospheric phenomenon where dust, smoke and other dry particles obscure the clarity of the sky (No condensation. Smog is similar to haze but there is condensation in smog).

Sources for haze particles include farming (ploughing in dry weather), traffic, industry, and wildfires.

Smog:

Smog = smoke + fog(smoky fog) caused by the burning of large amounts of coal, vehicular emission and industrial fumes (Primary pollutants).

92. Ans: (b)

93. Ans: (c)

Sol: Digilocker uses cloud computing in order to store user documents over the web but it uses public cloud not private cloud in order to store user documents.

Private cloud is used by an organization not by users. Private cloud is very expensive types of cloud as it provides dedicated storage while digilocker provides sharable storage 1 GB to each user.

94. Ans: (d)

Sol: NFC is standards for communication where it uses frequency of 13.5 MHz which operates at unlicensed frequency and having distance 0-4 cm.

95. Ans: (a)

Sol: e-sign mission in India uses digital signature which allows users to sign the documents without being physically present.



96. Ans: (a)

Sol: In designing a building for Fire Safety, various Fire Safety Equipment are used by designers to minimize the damage in an event of fire. The Design of the building is done in such a way that the spreading of fire and smoke is slowed down with the help of fire resistant materials or methods so that they give enough time for the occupants to evacuate the building safely.

97. Ans: (d)

Sol: Statement (II) is correct as design is a process of devising a product to meet the needs of the customer and quality means conformance to norms or standards (means meeting the requirements of the customer).

Statement (I) is incorrect because the design and quality are performed simultaneously.

98. Ans: (a)

99. Ans: (b)

Sol: Organic farming rely on crop rotation, avoids use of synthetic fertilizers, pesticides thus reducing the emission of green house gases.

100. Ans: (d)

Sol: Fine grain materials are having large grain boundaries and they are low energy regions so external oxygen atoms easily react with grain boundary atoms forms rust.

Fine grain materials are not used in high temperature application purpose because they are having more slip deformation.



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