DETAILED SOLUTIONS

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ESE 2026 : Prelims Exam | CLASSROOM TEST SERIES

GS & ENGINEERING APTITUDE

Test 19

Full Syllabus Test 3 : (Paper-I)

ANSWER KEY

1.	(d)	21.	(b)	41.	(c)	61.	(a)	81.	(b)
2.	(c)	22.	(a)	42.	(d)	62.	(d)	82.	(c)
3.	(a)	23.	(b)	43.	(b)	63.	(b)	83.	(a)
4.	(c)	24.	(a)	44.	(d)	64.	(c)	84.	(d)
5.	(b)	25.	(a)	45.	(b)	65.	(d)	85.	(b)
6.	(b)	26.	(c)	46.	(b)	66.	(a)	86.	(d)
7.	(a)	27.	(d)	47.	(c)	67.	(b)	87.	(b)
8.	(c)	28.	(b)	48.	(c)	68.	(a)	88.	(b)
9.	(a)	29.	(d)	49.	(b)	69.	(d)	89.	(b)
10.	(d)	30.	(c)	50.	(c)	70.	(b)	90.	(c)
11.	(c)	31.	(c)	51.	(b)	71.	(a)	91.	(c)
12.	(c)	32.	(b)	52.	(b)	72.	(a)	92.	(c)
13.	(d)	33.	(c)	53.	(b)	73.	(a)	93.	(b)
14.	(d)	34.	(d)	54.	(b)	74.	(b)	94.	(a)
15.	(b)	35.	(c)	55.	(c)	75.	(b)	95.	(b)
16.	(d)	36.	(c)	56.	(b)	76.	(d)	96.	(b)
17.	(d)	37.	(a)	57.	(a)	77.	(a)	97.	(b)
18.	(d)	38.	(b)	58.	(b)	78.	(b)	98.	(b)
19.	(c)	39.	(c)	59.	(c)	79.	(b)	99.	(a)
20.	(c)	40.	(a)	60.	(a)	80.	(a)	100.	(b)

1. (d)

Digital gold refers to buying gold without physically possessing the precious metal.

- The price of digital gold is linked to that of physical gold.
- Digital gold is created using blockchain technology.
- It allows investors to buy, sell and store gold electronically.
- In India, buying gold, whether physical or digital, usually attracts GST, though the exact rate for digital gold can vary depending on how the provider structures the product.
  - When you sell digital gold, any profit is treated as a capital gain, and the tax rate depends on how long you have held it.
  - Digital gold is easy to access and allows one to sell it quickly in case of an emergency.
  - Unlike traditional gold purchases, digital gold allows investors to start investing with smaller amounts.

2. (c)

A Goldilocks Economy is typically characterized by moderate economic growth and low inflation, creating a stable environment for policy-making and economic activity. It is neither too hot to cause high inflation nor too cold to cause recession or economic stagnation.

3. (a)

- The Office of the Economic Adviser, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, compiles and publishes the Index of Eight Core Industries (ICI).
- The Eight Core Industries together constitute about 40.27% of the weight in the IIP, making ICI an important leading indicator of overall industrial performance.
- The Index of Eight Core Industries is released on a monthly basis, usually at the end of the subsequent month after the reference month.

4. (c)

The Abraham Accords marked a historic diplomatic breakthrough where UAE, Bahrain, later Sudan and Morocco agreed to normalise relations with Israel, with the U.S. as mediator. The accords focus on economic cooperation, tourism, investment, and regional security.

5. (b)

6. (b)

In the aftermath of Cyclone Ditwah, which caused widespread devastation across Sri Lanka, India swiftly launched Operation Sagar Bandhu to support relief and rescue efforts.

7. (a)

Engineering codes rely heavily on Intrinsic Values like Integrity, Public Safety, and honesty. While profitability is a goal, the Codes prioritize safety and ethics over profit.

8. (c)
Strict liability focuses on the product defect, not the conduct. Negligence focuses on the conduct (carelessness).

9. (a)

10. (d)

11. (c)
Probity is the "gold standard" of integrity - incorruptibility combined with strict adherence to proper procedures.

12. (c)

13. (d)

14. (d)

15. (b)

16. (d)

17. (d)

18. (d)

19. (c)

20. (c)

21. (b)

22. (a)
- Electrostatic Precipitators use high voltage to charge dust particles, removing over 99% of particulate matter (fly ash).
- ESPs remove solid particles. They cannot remove gases like Sulfur Dioxide and Nitrogen Oxides. For gases, other technologies like Flue Gas Desulfurization (FGD) or Selective Catalytic Reduction (SCR) are used.

23. (b)
As temperature increases, the efficiency of solar panels decreases (due to increased resistance/ voltage drop). They work best in cool, sunny conditions.

24. (a)
Chilika Lake was removed from the Montreux Record in 2002 due to successful restoration. Currently, India has two sites on the Montreux Record: Keoladeo National Park (Rajasthan) and Loktak Lake (Manipur).

25. (a)
- VoWiFi routes the voice traffic through the Wi-Fi connection to the operator's core network, bypassing the local cell tower.

- Both VoLTE and VoWiFi use the IMS core. The Wi-Fi access point just acts as another "tower" connecting to the same core network.
- VoWiFi is a native feature built into the phone's dialer and the telecom operator's network. It does not require apps like WhatsApp; calls are made using the standard phone dialer.

26. (c)

- The Deep Web is simply anything behind a login or not meant to be public (e.g., your email inbox, Netflix subscription content). It is not necessarily illegal but requires credentials or specific URLs to access.
- The Dark Web is a small, specialized portion of the Deep Web. Unlike the rest of the Deep Web, it is intentionally hidden using encryption and masked IP addresses. It cannot be accessed through standard browsers like Chrome or Safari. The Dark Web uses overlay networks (like Tor browser) to anonymize traffic and access the hidden part of the internet that is not indexed by conventional search engines.

27. (d)

The given statements correctly describe different forms of social engineering attacks categorized by their communication medium - email (Phishing), voice (Vishing), and SMS(Smishing).

28. (b)

- Ayushman Bharat Health Account (ABHA) is the 14-digit ID. UHI is similar to UPI but for health services.
- ABDM does NOT store medical records centrally. These are always created and stored by healthcare providers.
- UHI is envisioned as an open protocol for various digital health services which will enable a wide variety of digital health services between patients and health service providers (HSPs) including appointment booking, teleconsultation, service discovery and others.

29. (d)

- Compilers create an executable file (.exe) that runs fast.
- Interpreters read one line, convert it, run it, then move to the next. This makes debugging easier but execution slower.
- C++ is a compiled language because it uses a compiler to translate the source code into machine code. Whereas Python is an interpreted language because it executes code logic directly, line by line, without the need for a separate compilation step.

30. (c)

- Cookies are small pieces of data stored in the user's browser. They help remember things like login status or preferences even after closing the website.
- Session cookies are for active memory. They are also known as temporary cookies which are present as long as the user browser is open. Whereas "Persistent Cookies" stay longer (for "Remember Me" features).
- Cookies are just text data. They are not executable programs and cannot be viruses. However, "Third-party cookies" tracked by websites other than the one you visit can be used for tracking privacy, which is controversial, but they are not malware / viruses.

31. (c)

WiMAX stands for Worldwide Interoperability for Microwave Access. This technology is based on IEEE 802.16 standard, that is intended for wireless Metropolitan Area Networks (MAN). It is used to provide higher data rates with increased coverage up to 50 km.

32. (b)

In surface development these are four main type of development:

1. **Parallel line development:** It is employed in case of prism and cylinders in which stretch outline principle is used.
2. **Radial line development:** It is used for right pyramids and right cones in which the true length of the slant edge.
3. **Triangulation development:** It is used to develop transition pieces, in which surface used to divided into a number of triangles and transferring them into development.
4. **Approximate method:** It is used to develop object of double curved or warped surface as sphere, paraboloid, ellipsoid and hyperboloid.

33. (c)

Grounding of electrical equipment is the primary method of reducing electrical hazards.

1. The purpose of grounding is to safeguard people from electrical shocks, reduce the probability of a fire, and protect equipment from damage.
2. Grounding ensures a path to the earth for the flow of excess current.
3. Grounding also eliminates the possibility of a person being shocked by contact with a charged capacitor

Statement 3 is not describing purpose of grounding

34. (d)

Four stage involved in creative thinking:

Stage-1: Preparation

Stage-2: Incubation

Stage-3: Inspiration

Stage-4: Verification

35. (c)

Class A: These are the fires involving solid material normally of organic nature. Class 'A' fires are the most common.

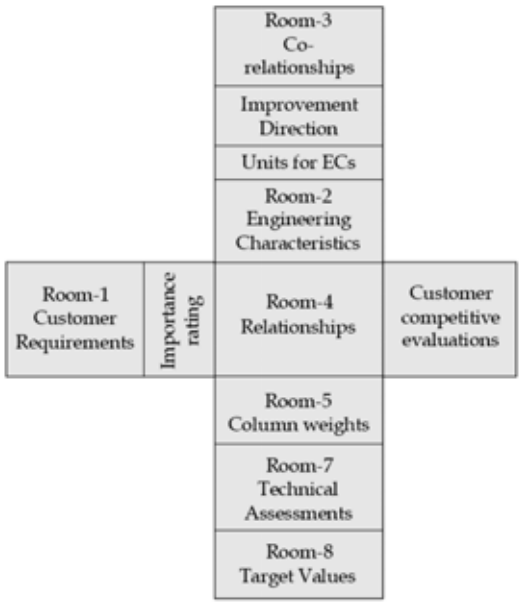
Class B: Flammable liquids such as gasoline, petroleum etc.

Class C: Gas leakage and these includes methane, propane, butane etc.

Class D: These are fires involving metals.

36. (c)

The quality function development matrix is as shown below:



37. (a)

Given, $\text{RF} = \dfrac{\text{Distance on drawing}}{\text{Actual distance}}$

Distance on drawing corresponding to 10 cm of actual distance

$$5 = \frac{x}{10\text{ cm}}$$

$$\therefore \quad x = 5\text{ cm}$$

List count, $\text{LC} = \dfrac{1}{x} = \dfrac{1}{50} = 0.02\text{ cm or } 0.2\text{ mm}$

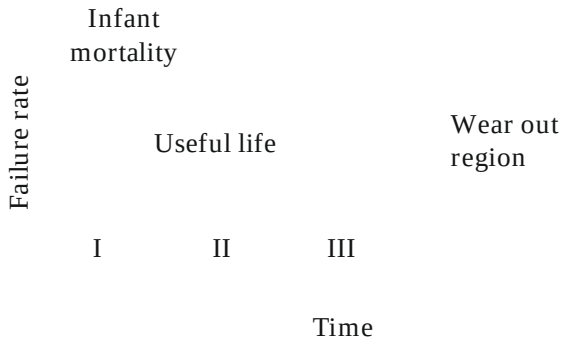
38. (b)

39. (c)

According Domino model of accident; five step series of events that occurs in a fixed and logical order. According to the promise of the model, its chronological factors can be summarized as follows:

1. Ancestry and social environment
2. Faults of person
3. Unsafe act / Mechanical or physical hazard.
4. Accidents
5. Injuries

40. (a)



41. (c)

42. (d)

Dimensions of services quality included:

1. Availability	2. Communication
3. Competency	4. Humility
5. Reliability	6. Trust
7. Responsiveness	8. Security
9. Understanding	10. Tangible factors

43. (b)

Failure rate, $\lambda = 0.0002$ per hour

$$\text{Mean time to failure (MTTF)} = \frac{1}{\lambda} = \frac{1}{0.0002}$$

$$= 5000 \text{ hour}$$

44. (d)

45. (b)

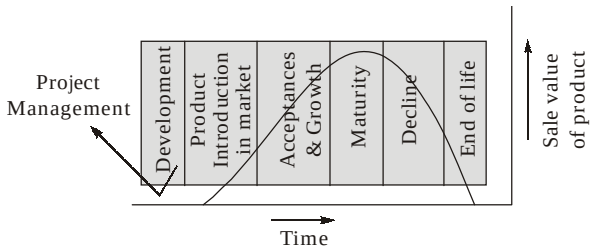
46. (b)

P-chart is an attribute control chart.

47. (c)

48. (c)

Maturity phase gives the mad amount of product sale.



49. (b)

A project manager might be new to a project team and a complete stranger. So it is not necessary that team will have confidence in project manager.

50. (c)

The Delphi technique provides a means for arriving at a consensus using a panel of experts to determine a solution to a specific problem. Project risk experts are identified but participate anonymously. Each panelist answers a questionnaire. Then the responses, along with opinions and justifications, are evaluated, and statistical feedback is given to each panel member. The process continues until group responses converge toward a solution.

51. (b)

$$\text{Cost of equity} = \frac{DPS}{MPS} + r = \frac{12}{125} + 0.08$$

$$= 0.096 + 0.08 = 0.176$$

Thus, cost of equity = 17.6%

52. (b)

$$t_{1-2} = \frac{1+2\times4+3}{6} = 2$$

$$t_{2-3} = \frac{3+5\times4+7}{6} = 5$$

$$t_{3-5} = \frac{5+6\times4+10}{6} = 6.5$$

$$t_{2-4} = \frac{2+4\times4+6}{6} = 4$$

$$t_{4-5} = \frac{4+4\times6+10}{6} = 6.33$$

Critical path is (1) → (2) → (3) → (5)

Now,

$$\sigma_{1-2} = \frac{3-1}{6} = \frac{1}{3}$$

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

$$\sigma_{3-5} = \frac{10-5}{6} = \frac{5}{6}$$

Now,

$$\sigma = \sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{2}{3}\right)^2 + \left(\frac{5}{6}\right)^2} = \frac{\sqrt{5}}{2}$$

53. (b)

$$\text{SPI} = \frac{EV}{PV} > 1 \text{ i.e. (Schedule performance index)}$$

$$\text{CPI} = \frac{EV}{AC} < 1 \text{ i.e. (Cost performance index)}$$

54. (b)

CV → Positive → under budget

SV → Negative → behind schedule

55. (c)

Let, the initial cost of 1 machine = x

Now, salvage value, S.V. = 40% of x = $0.4x$

So, depreciation per annum = $\frac{x - 0.4x}{5} = \frac{0.6x}{5}$

Now, accounting rate of return (%) = $\left(\frac{\text{Average annual profit after taxes}}{\text{Average investment over the whole life} \times 1000}\right)$ ...(i)

Now, average annual profit after taxes = $50000 - \frac{0.6x}{5}$ ...(ii)

Also, average investment over whole life = x ...(iii)

Putting in equation (ii) and (iii), we get

$$0.2 = \frac{50000 - \frac{0.6x}{5}}{x}$$

$$\Rightarrow \quad 0.2x + \frac{0.6x}{5} = 50000$$

$$\Rightarrow \quad 1.6x = 250000$$

$$\Rightarrow \quad x = 156250$$

So, total cost of 2 machines = 2 × 1562500

= Rs.312500

56. (b)

Smart (or intelligent) materials are a group of new and state-of-the-art materials now being developed that will have a significant influence on many of our technologies. The adjective 'smart' implies that these materials are able to sense changes in their environment and then respond to these changes in predetermined manners—traits that are also found in living organisms.

57. (a)

Ionic and metallic bonds are primary bonds formed by strong electrostatic attractions. They have high bond energies and require large amounts of energy to break. In contrast, hydrogen bonds and van der Waals forces are secondary (intermolecular) bonds that result from dipole-dipole interaction and do not involve full electron transfer or sharing, so they are much weaker and require comparatively little energy to disrupt. The order of bond strength from strongest to weakest is given by: Ionic > Covalent > Metallic > Hydrogen > Vander Waals

Bonding Type	Bonding Energy (kJ/mol)
Ionic	600 - 1500
Covalent	450 - 720
Metallic	62 - 850
Vander Waals	4 - 30
Hydrogen	35 - 51

58. (b)

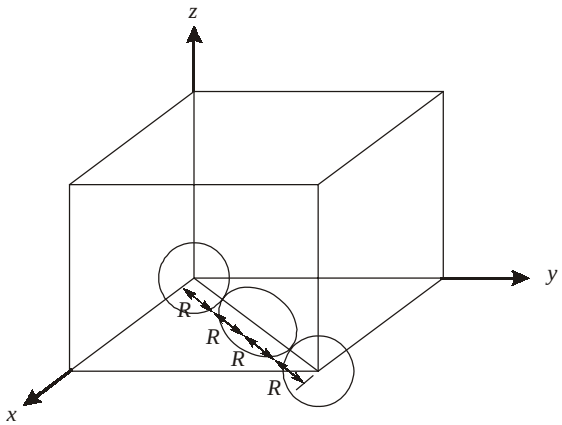
Crystal system	Axial Relationships	Interaxial angles
Cubic	$a = b = c$	$\alpha = \beta = \gamma = 90°$
Hexagonal	$a = b \neq c$	$\alpha = \beta = 90°, \gamma = 120°$
Tetragonal	$a = b \neq c$	$\alpha = \beta = \gamma = 90°$
Rhombohedral (Trigonal)	$a = b = c$	$\alpha = \beta = \gamma \neq 90°$
Orthorhombic	$a \neq b \neq c$	$\alpha = \beta = \gamma = 90°$
Monoclinic	$a \neq b \neq c$	$\alpha = \gamma = 90° \neq \beta$
Triclinic	$a \neq b \neq c$	$\alpha \neq \beta \neq \gamma \neq 90°$

59. (c)

$$LD = \frac{\text{Number of atoms centered on direction vector}}{\text{Length of direction vector}}$$

For FCC crystal:

Equivalent number of atoms centered on direction vector $= 1 + \frac{1}{2} \times 2 = 2$



$$LD_{110} = \frac{2}{\sqrt{2}a} \qquad \{\because \sqrt{2}a = 4R\}$$

$$= \frac{2}{4R}$$

Length of the [1 1 0] direction vector $= \sqrt{a^2 + a^2} = \sqrt{2}a$

or $LD_{110} = \dfrac{1}{2R}$

60. (a)

Given : a = 0.288 nm; n = 1; λ = 0.096 nm

Using Bragg's Law, $\sin\theta = \dfrac{n\lambda}{2d_{hkl}}$

where d_{hkl} is the interplanar spacing given by

$$d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}} = \frac{0.288}{\sqrt{(2)^2 + (2)^2 + (1)^2}}$$

$$\Rightarrow \quad d_{hkl} = \frac{0.288}{3} = 0.096$$

$$\therefore \quad \sin\theta = \frac{1 \times 0.096}{2 \times 0.096} = 0.5$$

$$\Rightarrow \quad \theta = 30°$$

61. (a)

Given : C_A = 1.0 kg / m^3; C_B = 0.6 kg / m^3

$x_B - x_A$ = 7 mm

D = 6 × 10^{-11} m^2 / s

Using Fick's First Law for steady-state diffusion:

$$J = -D\frac{\partial C}{\partial x} = -(6 \times 10^{-11}) \times \frac{(C_A - C_B)}{(x_A - x_B)}$$

$$= (6 \times 10^{-11}) \times \frac{0.4}{7 \times 10^{-3}}$$

$$\Rightarrow \quad J = 3.4 \times 10^{-9} \text{ kg / m}^2\text{-s}$$

62. (d)

The dielectric loss factor (tan δ) represents the energy loss due to the polarization lag behind the applied alternating electric field.

63. (b)

The Meissner effect is the expulsion of magnetic flux from a superconductor below its critical temperature, which is a magnetic property.

64. (c)

Here, coercivity, H = 15 × 10^3 A / m

For solenoid, l = 10 cm and total turns = 500

$$\text{Turns per metre, } N = \frac{500}{10 \text{ cm}} = 5000 \text{ turns / m}$$

To demagnetize a bar magnet, the magnetic field intensity (H) of the solenoid given by $H = Ni$ shall be equal to the coercivity of the bar magnet i.e.

$$15 \times 10^3 = 5000 \times i$$
$$i = 3A$$

65. (d)

Nichrome (Ni-Cr) and Kanthal (Fe-Cr-Al) are both excellent resistance heating alloys, but Kanthal offers higher resistivity, better oxidation resistance, and higher maximum operating temperature.

66. (a)

Stored energy, $W = \frac{1}{2}\vec{P}\cdot\vec{E}$

$\vec{P} \rightarrow$ Polarization

$\vec{E} \rightarrow$ Electric field

67. (b)

Stored energy, $E_1 = \frac{1}{2}CV^2$ (without dielectric)

and $E_2 = \frac{1}{2}kCV^2$ (with dielectric)

Thus, C increases 'k' times with introduction of dielectric (k is dielectric constant). . Hence, Dielectric constant of the material is 3.

68. (a)

$$E(X) = \sum_{i=0}^{3} x_i P(x_i)$$
$$= 0(0.1) + 1(0.3) + 2(0.4) + 3(0.2) = 1.7$$

69. (d)

A is square matrix of order $(n + 1)$

Rank of $A = 1$, because A has only one independent row.

In the system $AX = 0$, X is a column matrix with $(n + 1)$ variables.

$\therefore$ Number of linearly independent solutions

= number of variables – rank of A

$= (n + 1) - 1 = n$

70. (b)

The equation of the line is given by

$$\frac{x}{2} = \frac{y}{1} = \frac{z}{3} = t$$

$\Rightarrow$ $x = 2t$, $y = t$ and $z = 3t$

$\Rightarrow$ $dx = 2dt$, $dy = dt$ and $dz = 3dt$

t varies from 0 to 1. Thus,

$$\int_c \bar{F}\, d\bar{r} = \int_0^1 \left[3x^2\hat{i} + (2xz - y)\hat{j} + z\hat{k}\right]\left(dx\hat{i} + dy\hat{j} + dz\hat{k}\right)$$

$$= \int_0^1 3\left(4t^2\right)2dt + (12t^2 - t)dt + 9t\,dt$$

$$= \left[8t^3 + 4t^3 - \frac{t^2}{2} + \frac{9t^2}{2}\right]_0^1 = 16$$

71. (a)

Since, A is singular, $\lambda = 0$ is an eigen value

Also, rank of $A = 1$

The root $\lambda = 0$ is repeated $n - 1$ times. Since the sum of the eigen values is equal to the trace of the matrix, thus

$$\text{Trace of } A = n = 0 + 0 + \ldots\ldots + \lambda_n$$

$$\Rightarrow \quad \lambda_n = n$$

$\therefore$ The distinct eigen values are 0 and n.

72. (a)

We know that, $\text{Total probability} = \int_{-\infty}^{\infty} f(x)dx = 1$

$$\Rightarrow \quad \int_0^2 cx\,dx = 1$$

$$\Rightarrow \quad c = \frac{1}{2}$$

Thus, $P(X > 1) = \int_1^{\infty} f(x)dx = \int_1^2 \frac{1}{2}xdx = \frac{3}{4} = 0.75$

73. (a)

The given equation is linear differential equation with

$$\text{Integrating factor} = e^{2x}$$

Thus, the solution is given by

$$u \cdot e^{2x} = \int 2e^{2x}dx + c$$

$$u = 1 + ce^{-2x}$$

Applying initial condition $u(0) = 2$,

We get $c = 1$

$\therefore$ The solution is $u = 1 + e^{-2x}$

74. (b)

Given equation in symbolic form is

$$(D^2 + D)y = x^2 + 2x + 4$$

$$\text{P.I.} = \frac{1}{D(D+1)}\left(x^2+2x+4\right)$$

$$= \frac{1}{D}(1+D)^{-1}\left(x^2+2x+4\right)$$

$$= \frac{1}{D}\left(1-D+D^2 \_\_\_\_\right)\left(x^2+2x+4\right)$$

$$= \frac{1}{D}\left[x^2+2x+4-(2x+2)+2\right]$$

$$= \int\left(x^2+4\right)dx = \frac{x^3}{3}+4x$$

75. (b)

$$\vec{\nabla}\times\vec{u} = \left(\frac{\partial u_z}{\partial y}-\frac{\partial u_y}{\partial z}\right)\hat{i}+\left(\frac{\partial u_x}{\partial z}-\frac{\partial u_z}{\partial x}\right)\hat{j}+\left(\frac{\partial u_y}{\partial x}-\frac{\partial u_x}{\partial y}\right)\hat{k}$$

$$= 0\hat{i}+0\hat{j}+\left(2y-2y\right)\hat{k}$$

$$= \bar{0}$$

76. (d)

If $A_{n\times n}$ has n distinct eigen values, then A has n linearly independent eigen vectors.

If zero is one of the eigen values of A, then A is singular and A^{-1} does not exist.

If A is singular then rank of $A < 3$ and A cannot have 3 linearly independent rows.

$\therefore$ Only option (d) is correct.

77. (a)

$$\nabla\phi = \frac{\partial\phi}{\partial x}\hat{i}+\frac{\partial\phi}{\partial y}\hat{j}+\frac{\partial\phi}{\partial z}\hat{k}$$

$$= \left(10xy+2.5z^2\right)\hat{i}+(5x^2-10yz)\hat{j}+(-5y^2+5zx)\hat{k}$$

$$= 12.5\hat{i}-5\hat{j} \text{ at } P(1,1,1)$$

The line passing through the point $A(x_0, y_0, z_0)$ and $B(x_1, y_1, z_1)$ is given by

$$\frac{x-x_0}{x_1-x_0} = \frac{y-y_0}{y_1-y_0} = \frac{z-z_0}{z_1-z_0}$$

Hence, the line passes through $A(1, 3, 0)$ and $B(3, 1, 1)$. Thus, a unit vector in the direction of the line is given by

$$\hat{A} = \frac{(3-1)\hat{i}+(1-3)\hat{j}+(1-0)\hat{k}}{\sqrt{(3-1)^2+(1-3)^2+(1-0)^2}}$$

$$= \frac{2\hat{i} - 2\hat{j} + \hat{k}}{3}$$

Hence, the required directional derivative = $\vec{\nabla}\phi \cdot \hat{A}$

$$= \left(12.5\hat{i} - 5\hat{j}\right) \cdot \frac{\left(2\hat{i} - 2\hat{j} + \hat{k}\right)}{3} = \frac{(25+10)}{3} = \frac{35}{3} = 11\frac{2}{3}$$

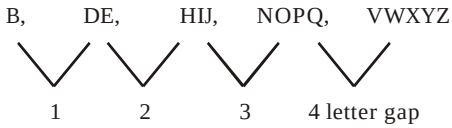
78. (b)

Given, $\text{Area}_2 = 2(\text{Area}_1)$

$$\frac{1}{2} \times 20 \times h_2 = 2\left(\frac{1}{2} \times 15 \times 12\right)$$

$\therefore$ $h_2 = 18$ cm

79. (b)



80. (a)

Since 3! is a factor of 5! and 7! and 5! is a factor of 7!, thus LCM of 3!, 5! and 7! = 7! = 5040.

81. (b)

Since the mixture is sold at CP, the water added will give the profit

Thus, $\text{Profit\%} = \frac{\text{Cost of 5 litres milk}}{\text{Cost of 20 litres milk}} \times 100 = 25\%$

82. (c)

Let given expression is x.

i.e. $x = \sqrt{56 + \sqrt{56 + \sqrt{56 + ...}}}$

$\Rightarrow$ $x = \sqrt{56 + x}$

Squaring both sides $x^2 = 56 + x$

$x^2 - x - 56 = 0$

$(x - 8)(x + 7) = 0$ [$x > 0$ because square root is always positive]

or $x = 8$ is the answer.

83. (a)

$$\text{Required probability} = \frac{40}{100} \times \frac{20}{100} \times \frac{25}{100} = 0.02$$

84. (d)

Required least number = LCM of (12, 15, 18) + Common remainder

= LCM of (12, 15, 18) + 3

= 180 + 3 = 183

85. (b)

A train crosses the man in the time given by

$T = \frac{L(T)}{S(T)}$, where $L(T)$ is the length of the train and $S(T)$ is the speed of the train

$$20 = \frac{280}{S(T)}$$

$$S(T) = 14 \text{ m/s}$$

$$\text{Platform crossover time} = \frac{L(T)+L(P)}{S(T)}$$

$$60 = \frac{280+x}{14 \text{ m/s}} \quad \text{(Assuming the length of the platform as '}x\text{')}$$

$$x = 60[14] - 280 = 560 \text{ m}$$

86. (d)

A number is divisible by 24, if the number is divisible by 3 and 8, because $24 = 3 \times 8$

Divisibility by 8 rule, is checking last 3 digits of number is divisible by 8 or not.

Divisibility by 3 rule, is checking sum of digits for given number is divisible by 3 or not.

Using above rules, we can find 3125736 is divisible by 24.

87. (b)

$$3^{(x+y)} = 81 \qquad 81^{(x-y)} = 3$$

$$3^{(x+y)} = 3^4 \qquad 3^{4(x-y)} = 3^1$$

$$\therefore \quad x+y = 4 \quad ...(i) \qquad 4(x-y) = 1$$

$$x-y = \frac{1}{4} \quad ...(ii)$$

Solving (i) and (ii), we get $x = \frac{17}{8}$, $b = \frac{15}{8}$

88. (b)

$$\text{Sushil} + \text{Mukesh} = 200 \quad ...(1)$$

$$\text{Asim} + \text{Rajesh} = \text{Sushil} \quad ...(2)$$

$$\text{Mukesh} = 4\,\text{Rajesh} \quad ...(3)$$

$$\text{Rajesh} = \text{Asim} - 20$$

$$\Rightarrow \quad \text{Asim} = \text{Rajesh} + 20 \quad ...(4)$$

From equation (1) and (3),

$$\text{Sushil} + 4\,\text{Rajesh} = 200 \quad ...(5)$$

From equation (2) and (4),

$$\text{Rajesh} + \text{Rajesh} + 20 = \text{Sushil}$$

$$\text{Sushil} = 2\,\text{Rajesh} + 20 \quad ...(6)$$

From equation (5) and (6),

$$6\,\text{Rajesh} + 20 = 200$$

$6\,\text{Rajesh} = 180$

$\text{Rajesh} = 30$

Using equation (4) $\text{Asim} = 30 + 20 = 50$

89. (b)

The Ministry of Statistics and Programme Implementation (MoSPI) has proposed key changes to the Consumer Price Index (CPI) methodology — with a sharper focus on making the housing index more accurate and representative.

Also known as Retail Inflation, CPI measures the rate at which the prices of goods and services purchased by consumers for personal use increase over time.

90. (c)

National Social Assistance Programme (NSAP) was introduced on 15 August 1995.

- It is a fully funded Centrally Sponsored Scheme that extends financial support to individuals living below poverty line (BPL).
- Implemented by the Ministry of Rural Development, it operates across both rural and urban areas.
- NSAP covers old age pension, widow pension, disability pension, family benefit, and food security.

91. (c)

All projects don't require these knowledge areas uniformly. There might be situation where HR is on higher priority than any other.

92. (c)

The standard ethical procedure to handle a potential conflict of interest is Full Disclosure to the employer/client. If the client consents after disclosure, the work can often continue.

93. (b)

94. (a)

After Screening, 'Scoping' determines what needs to be studied. Scoping sets the boundaries (Terms of Reference) for the study so that the developer doesn't miss important impacts.

95. (b)

96. (b)

97. (b)

Cloud computing is a model for enabling on-demand network access to a shared pool of configurable computing resources. Virtualization is the fundamental technology that powers Cloud Computing. It allows to create virtual, simulated environments from a single, physical machine, allowing for more efficient use of resources. Thus, Both Statement (I) and Statement (II) are true but Statement (II) is not a correct explanation of Statement (I).

98. (b)

Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. It is an interpreted language because it executes code logic directly, line by line, without the need for a separate compilation step. Thus, Both Statement (I) and Statement (II) are true but Statement (II) is not a correct explanation of Statement (I).

99. (a)

100. (b)

Porosity is one microstructure variable that must be controlled to produce a suitable refractory brick. Strength, load-bearing capacity, and resistance to attack by corrosive material, all increase with porosity reduction. At the same time, thermal insulation characteristics and resistance to thermal shock are diminished. Of course, the optimum porosity depends on the condition of service.

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