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Preliminary Examination

Detailed Solutions of

General Studies and Engineering Aptitude

(Set-A)

Scroll down for detailed solutions

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Expected Cutoff of ESE 2020 Prelims (Out of 500 Marks)					Actual Cutoff of ESE 2019 Prelims (Out of 500 Marks)				
Branch	**Gen**	**OBC**	**SC**	**ST**	**Branch**	**Gen**	**OBC**	**SC**	**ST**
CE	210-220	205-215	170-180	170-180	**CE**	188	185	143	159
ME	245-255	245-255	210-220	210-220	**ME**	187	187	166	169
EE	225-235	215-225	195-205	195-205	**EE**	221	211	191	172
E&T	235-245	225-235	185-195	185-195	**E&T**	226	221	176	165

General Studies and Engineering Aptitude Paper
Analysis : ESE 2020 Prelims Exam

Sl.	Subjects	No. of Qs.	Level of Qs.
1	Current issues of national and international importance	10	Very Difficult
2	Reasoning & Aptitude	10	Easy-Moderate
3	Engineering Mathematics and Numerical Analysis	10	Moderate
4	General Principles of Design, Drawing, Importance of Safety	10	Moderate
5	Standards and Quality Practices	10	Easy & Scoring
6	Basics of Energy and Environment	10	Moderate-Tough
7	Basics of Project Management	12	Moderate
8	Basics of Material Science and Engineering	10	Moderate
9	Information and Communication Technologies (ICT)	12	Balanced
10	Ethics and values in Engineering profession	6	Easy

UPSC ESE/IES Prelims 2020 Paper-1

GS and Engineering Aptitude Analysis & Expected Cut-off

by **MADE EASY** Faculties

https://www.youtube.com/watch?v=LKCmILwE0QM&feature=youtu.be

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1. What is TADF?
(a) Technology Acquired Desired Firm
(b) Technologically Advanced Direct Fund
(c) Technologically Accomplished Direct Fund
(d) Technology Acquisition and Development Fund

Ans. (d)

End of Solution

2. Technical textiles are
(a) the high-tenacity fibres which are lightest and toughest fabrics mainly used in automobile and aerospace industries
(b) the toughest fabrics which are much heavier than polyester and used in power industries
(c) the toughest fabrics having rigidity mainly used in polyhouse construction
(d) the high-tenacity fabrics having fire resistance property

Ans. (a)

End of Solution

3. Which one of the following is a measure of sustainable income level that can be secured without decreasing the stock of natural assets?
(a) Natural Capital Stock
(b) Environmental Value
(c) Green Accounting
(d) Social Discount Rate

Ans. (c)

End of Solution

4. Which of the following is a resource allocation as per Chenery's development process?
(a) Investment
(b) Structure of domestic demand
(c) Labour allocation
(d) Government revenue

Ans. (b)

End of Solution

5. Which one of the following ratios is referred to as everything that has been invested in the past and to the whole income?
(a) Capital-output ratio
(b) Average capital-output ratio
(c) Incremental capital-output ratio
(d) Marginal ratio

Ans. (b)

End of Solution

6. Which one of the following methods of planning is an attempt to work out the implications of the development effort in terms of factor allocations and product yields so as to maximize income and employment?

(a) Perspective planning
(b) Physical planning
(c) Financial planning
(d) Indicative planning

Ans. (b)

End of Solution

7. Which one of the following reflects an intrinsic or true value for factors or products?
(a) Price inflation
(b) Economy pricing
(c) Penetration pricing
(d) Shadow price

Ans. (d)

End of Solution

8. Which one of the following control policies leaves no freedom to private enterprise to buy plant, machinery, raw materials from the country of its choice?
(a) Import control
(b) Export control
(c) Exchange control
(d) Physical control

Ans. (a)

End of Solution

9. Which one of the following is a particular form of collusive price-fixing behaviour by which firms coordinate their bids on procurement or project contracts?
(a) Predatory pricing
(b) Horizontal price-fixing (collusion)
(c) Bid rigging
(d) Exclusive territory

Ans. (c)

End of Solution

10. Which one of the following is an example of horizontal practice of firm?
(a) Refusal to deal
(b) Retail price maintenance
(c) Predatory pricing
(d) Exclusive territory

Ans. (d)

End of Solution

11. Ten years ago father was 12 times as old as his son and after 10 years father will be 2 times older than his son. The present ages of father and son respectively are
(a) 32 years and 14 years
(b) 34 years and 14 years
(c) 32 years and 12 years
(d) 34 years and 12 years

Ans. (d)

Let, F = Father's age
S = Son's age

$$\frac{F-10}{S-10} = 12 \quad \ldots(i)$$

$$\frac{F+10}{S+10} = 2 \qquad \text{...(ii)}$$

Solving equations (i) and (ii),

$$F = 34; \quad S = 12$$

Alternative solution:

Using option (d)

Father's age (F) = 34 years

Son' age (S) = 12 years

$$\frac{F-10}{S-10} = \frac{34-10}{12-10} = \frac{24}{2} = 12$$

$$\frac{F+10}{S+10} = \frac{34+10}{12+10} = \frac{44}{22} = 2$$

End of Solution

12. A number of friends decided to go on a picnic and planned to spend ₹ 96 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute ₹ 4 each extra. The number of those friends who attended the picnic is

(a) 8 (b) 12

(c) 16 (d) 20

Ans. (a)

$$x \times y = 96 \qquad \text{...(i)}$$

$$(x - 4)(y + 4) = 96 \qquad \text{...(ii)}$$

Solving eq. (i) and (ii) we get,

$$x = 12, \; y = 8$$

$$\therefore \quad 12 - 4 = 8$$

Alternative Solution:

Using option (a)

$$8 \times 12 = 96$$

$$(12 - 4) \times (8 + 4) = 8 \times 12 = 96$$

End of Solution

13. Consider the following gold articles P, Q, R, S and T with different weights:

- P weighs twice as much as Q
- Q weighs four and a half times as much as R
- R weighs half as much as S
- S weighs half as much as T
- T weighs less than P but more than R

Article T will be lighter in weight than

(a) P and S (b) P and R

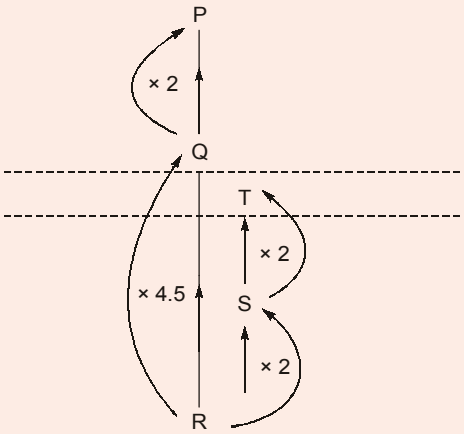
(c) P and Q (d) Q and R

Ans. (c)

P	:	Q	:	R	:	S	:	T
$2x$	:	x	:	$\frac{x}{4.5}$	:	$\frac{2x}{4.5}$	:	$\frac{4x}{4.5}$
$9x$	:	$4.5x$	:	x	:	$2x$	:	$4x$

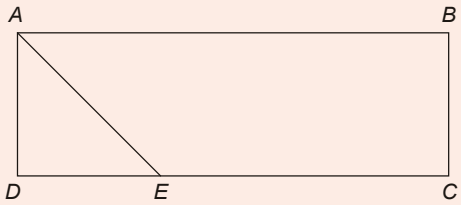
R < S < **T** < Q < P.

Alternative Solution:



End of Solution

14. Consider the rectangle ABCD with $DE = \frac{1}{3}DC$ in the figure:

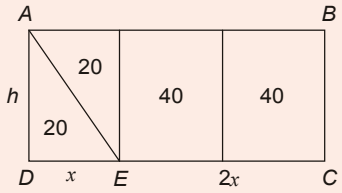


When the area of the triangle ADE is 20 cm^2, the area of the rectangle ABCD will be

(a) 60 cm^2 (b) 80 cm^2

(c) 100 cm^2 (d) 120 cm^2

Ans. (d)



$$\Delta_{ADE} = \frac{1}{2} \times x \times h = 20 \text{ (given)}$$

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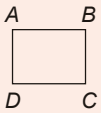
$x \times h = 40$



$\Rightarrow \quad 3x \times h = 3(xh) = 3(40) = 120$

End of Solution

15. Four metal rods of lengths 78 cm, 104 cm, 117 cm and 169 cm are to be cut into parts of equal length. Each part must be as long as possible. The maximum number of pieces that can be cut will be

(a) 27 (b) 36

(c) 43 (d) 52

Ans. **(b)**

HCF of 78, 104, 117, 169 is 13 (i.e. maximum length).

$$\text{Total pieces} = \frac{78}{13}+\frac{104}{13}+\frac{117}{13}+\frac{169}{13} = 6 + 8 + 9 + 13 = 36$$

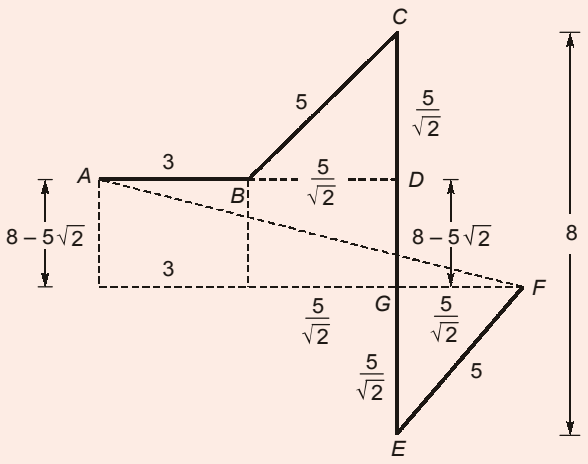
End of Solution

16. A man walked 3 km towards East, then 5 km towards North-East, then 8 km towards South and finally 5 km towards North-East direction. The distance of his present location from the starting point will be

(a) 9 km (b) 11 km

(c) 15 km (d) 21 km

Ans. **(b)**



$$AF = \sqrt{(8-5\sqrt{2})^2+(\sqrt{3}+5\sqrt{2})^2} = \sqrt{102} = 10.1$$

Best case answer is option (b).

End of Solution

17. A clock strikes once at 1 o'clock, twice at 2 o'clock, thrice at 3 o'clock and so on. The number of times it strikes in 24 hours will be

(a) 116 (b) 136

(c) 156 (d) 196

Ans. **(c)**

Time		No. of strikes
1	→	1
2	→	2
⋮		⋮
12	→	12

Time		No. of strikes
13	→	1
14		2
⋮		⋮
24	→	12

$$2[1 + 2 + 3 \ldots + 12] = 2 \times \frac{12 \times 13}{2} = 156$$

End of Solution

18. The sum of all the natural numbers between 1 and 101 which are divisible by 5 is

(a) 1000 (b) 1050

(c) 1500 (d) 2550

Ans. **(b)**

$$\text{Sum} = 5 + 10 + 15 + \ldots + 100$$

$$= 5(\Sigma 20) = 5 \times \frac{20 \times 21}{2} = 1050$$

End of Solution

19. In a group of 1000 people, 750 speak Hindi and 400 speak English. The number of only Hindi speaking people is

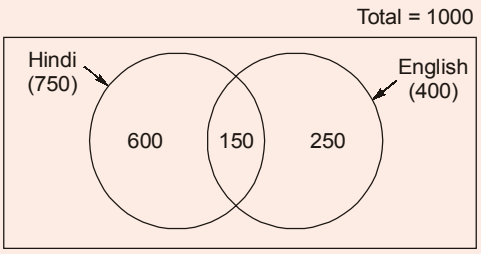
(a) 150 (b) 350

(c) 600 (d) 750

Ans. **(c)**

$$1000 = 750 + 400 - n(H \cap E)$$

$$\Rightarrow \quad n(H \cap E) = 150$$



Only Hindi = 600

End of Solution

20. Consider the following students in an examination:

- A scored more than B
- C scored as much as D
- E scored less than F
- B scored more than C
- F scored less than D

Who scored the lowest?

(a) E (b) C
(c) D (d) F

Ans. **(a)**

$$A > B > C = D > F > E$$

End of Solution

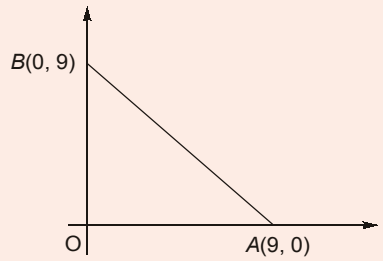
21. Find the absolute maximum and minimum values of

$$f(x,y) = 2 + 2x + 2y - x^2 - y^2$$

on triangular plate in the first quadrant, bounded by the lines $x = 0$, $y = 0$ and $y = 9 - x$.

(a) –4 (b) –2
(c) 4 (d) 2

Ans. **(c)**



$$f(x, y) = 2 + 2x + 2y - x^2 - y^2$$

Can have maximum (or) Minimum values at critical values inside ΔOAB (or) on its boundary.

$$f(x, y) = 2 + 2x + 2y - x^2 - y^2$$
$$f_x = 2 - 2x$$
$$f_y = 2 - 2y$$
$$f_x = 0 \text{ and } f_y = 0 \text{ gives critical point } (1, 1)$$

At (1, 1)

$$r = f_{xx} = -2$$
$$s = f_{xy} = 0$$
$$t = f_{yy} = -2$$
$$rt - s^2 = 4 > 0$$

and $r = -2 < 0$ max at (1, 1)

$\therefore$ Max value $f(1, 1) = 4$ at critical point

on OA, $y = 0$ $\quad f(x, y) = f(x, 0) = 2 + 2x - x^2 = g(x) \quad 0 \le x \le 9$

Absolute max $\quad g'(x) = 2 - 2x$

$g'(x) = 0, \quad x = 1$

$g(0) = 2$

$g(9) = -61$

$g(1) = 3$

$\therefore$ Absolute max = 3, Absolute min = –61

On OB, $x = 0$, $\quad f(x, y) = f(0, y) = 2 + 2y - y^2 \quad 0 \le y \le 9$

Absolute max = 3, Absolute min = –61

Along AB, $y = 9 - x$

$f(x, y) = f(x, 9 - x) = -61 + 18x - 2x^2 \quad 0 \le x \le 9$

$= h(x)$

$h'(x) = 18 - 4x$

$h'(x) = 0 \quad \Rightarrow \quad x = \frac{9}{2}$

$h(0) = -61 \quad h(9) = -1 \quad h(9/2) = -\frac{41}{2}$

$\therefore$ Absolute max. = 4

Absolute min. = –61

End of Solution

22. For the matrix $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ the expression

$$A^5 - 4A^4 - 7A^3 + 11A^2 - A - 10I$$

is equivalent to

(a) $A^2 + A + 5I$ (b) $A + 5I$

(c) $A^2 + 5I$ (d) $A^2 + 2A + 6I$

Ans. **(b)**

$$A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$$

Characteristic equation of A is $|A - \lambda I| = 0$

$$\begin{vmatrix} (1-\lambda) & 4 \\ 2 & (3-\lambda) \end{vmatrix} = 0$$

$(1 - \lambda)(3 - \lambda) - 8 = 0$

$3 - \lambda - 3\lambda + \lambda^2 - 8 = 0$

$\lambda^2 - 4\lambda - 5 = 0$

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By Cayley-Hamilton theorem we can replace λ by A

Hence, we have

$$A^2 - 4A - 5I = 0 \quad \text{...(i)}$$

Now given expression is

$$\begin{aligned} A^5 - 4A^4 - 7A^3 + 11A^2 - A - 10I &= A^3(A^2 - 4A - 5I) - 2A^3 + 11A^2 - A - 10I \\ &= A^3(0) - 2A(A^2 - 4A - 5I) + 3A^2 - 11A - 10I \\ &= A^3(0) - 2A(0) + 3(A^2 - 4A - 5I) + A + 5I \\ &= A^3(0) - 2A(0) + 3(0) + A + 5I \\ &= A + 5I \end{aligned}$$

End of Solution

23. The solution of the differential equation

$$\left(1+y^2\right)dx = \left(\tan^{-1}y - x\right)dy$$

is

(a) $x = \tan^{-1}y + 1 + ce^{-\tan^{-1}y}$ (b) $x = \tan^{-1}y - 1 + ce^{-\tan^{-1}y}$

(c) $x = \frac{1}{2}\tan^{-1}y - 1 + ce^{-\tan^{-1}y}$ (d) $x = \frac{1}{2}\tan^{-1}y + 1 + ce^{-\tan^{-1}y}$

Ans. **(b)**

$$(1 + y^2)\,dx = (\tan^{-1}y - x)\,dy$$

$$\frac{dx}{dy} = \frac{\tan^{-1}y - x}{1+y^2}$$

$$\frac{dx}{dy} + \frac{x}{1+y^2} = \frac{\tan^{-1}y}{1+y^2} \quad \text{....(i)}$$

Which is L.D.E. in x and y so on comparison with

$$\frac{dx}{dy} + Px = Q$$

We have

$$P = \frac{1}{1+y^2}$$

$$Q = \frac{\tan^{-1}y}{1+y^2}$$

$$\text{I.F.} = e^{\int P dy} e^{\int \frac{dy}{1+y^2}} e^{\tan^{-1}y}$$

Hence solution of eq. (i) is

$$x\,(\text{IF}) = \int Q(IF)dy + c$$

$$xe^{\tan^{-1}y} = \int \left(\frac{\tan^{-1}y}{1+y^2}\right) e^{\tan^{-1}y} dy + c$$

Put $\tan^{-1}y = t$

$\Rightarrow \quad \dfrac{dy}{1+y^2} = dt$

So, $xe^{\tan^{-1}y} = \int t.e^t\,dt + c$

$= te^t - e^t + c$

$xe^{\tan^{-1}y} = e^{\tan^{-1}y}\left(\tan^{-1}y - 1\right) + c$

$x = \tan^{-1}y - 1 + ce^{-\tan^{-1}y}$

End of Solution

24. The value of

$$\Delta^{10}\left[(1-ax)\left(1-bx^2\right)\left(1-cx^3\right)\left(1-dx^4\right)\right]$$

is

(a) $abcd(10!)$ (b) $abcd(9!)$

(c) $abcd(8!)$ (d) $abcd(7!)$

Ans. **(a)**

$$\Delta^{10}\left[(1-ax)\left(1-bx^2\right)\left(1-cx^3\right)\left(1-dx^4\right)\right]$$

In case of continuous function, forward difference operator 'Δ' and differentiation operator $\dfrac{d}{dx}$ are similar operations and expression given in the bracket is a polynomial of degree 10 with coefficient (abcd) as the coefficient of x^{10}.

So we can concluded that

$\Delta^{10}[(1 - ax)\ (1 - bx)\ (1 - cx)\ (1 - dx)]$

$= \dfrac{d^{10}}{dx^{10}}\left[(abcd)x^{10} + \ldots\right]$

$= abcd(10!)$

End of Solution

25. If $u = \log_e\left(\dfrac{x^4+y^4}{x+y}\right)$, the value of $x\dfrac{\partial u}{dx} + y\dfrac{\partial u}{dy}$ is

(a) 6 (b) 5

(c) 4 (d) 3

Ans. **(d)**

$$u = \log_e \frac{x^4+y^4}{x+y}$$

Can be written as $e^u = \dfrac{x^4+y^4}{x+y}$

is a homogeneous function of degree

$$n = 4 - 1 = 3$$

and $\phi(u) = e^u$

By Euler theorem

$$x\frac{\partial u}{dx} + y\frac{\partial u}{dy} = n\frac{\phi(u)}{\phi'(u)} = 3\frac{e^u}{e^u} = 3$$

End of Solution

26. The general value of log (1 + i) + log (1 − i) is

(a) $\log 2 - 4n\pi i$ (b) $\log 2 + 4n\pi i$

(c) $\log 2 + 2n\pi i$ (d) $\log 2 - 2n\pi i$

Ans. **(c)**

General value of log(1 + i) + log (1 − i)

$$\log(1+i) + \log(1-i) = \log(1+i)(1-i)$$
$$= \log(1^2 + 1^2)$$
$$= \log 2$$
$$= \log 2 + \log 1$$
$$= \log 2 + \log e^{i2n\pi}$$
$$= \log 2 + i2n\pi$$

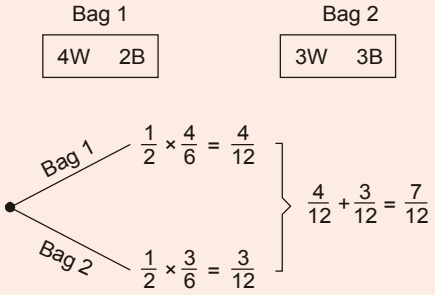
End of Solution

27. A bag contains 4 white and 2 black balls and another bag contains 3 of each colour. A bag is selected at random and a ball is drawn at random from the bag chosen. The probability of the white ball drawn is

(a) $\frac{1}{3}$ (b) $\frac{1}{4}$

(c) $\frac{5}{12}$ (d) $\frac{7}{12}$

Ans. **(d)**



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28. X is a continuous random variable with probability density function given by

$f(x) = kx \quad (0 \le x < 2)$

$= 2k \quad (2 \le x < 4)$

$= -kx + 6k \quad (4 \le x < 6)$

The value of k will be

(a) $\frac{2}{3}$ (b) $\frac{1}{8}$

(c) 1 (d) 8

Ans. **(b)**

$$\int_{-\infty}^{\infty} f(x)\,dx = 1$$

$$\int_0^2 kx\,dx + \int_2^4 2k\,dx + \int_4^6 (-kx + 6k)\,dx = 1$$

$$k\left(\frac{x^2}{2}\right)\Big|_0^2 + 2k(x)\Big|_2^4 + \left(-k\frac{x^2}{2} + 6kx\right)\Big|_4^6 = 1$$

$\Rightarrow$ $k(2 - 0) + 2k\,(4 - 2) + (-18k + 36k) - (-8k + 24k) = 1$

$\Rightarrow$ $2k + 4k + 18k - 16k = 1$

$\Rightarrow$ $2k + 4k + 2k = 1$

$8k = 1$

$\therefore$ $k = \frac{1}{8}$

End of Solution

29. The first moment about origin of binomial distribution is

(a) np (b) npq

(c) $n(1 - p)$ (d) $n(1 - p)q$

Ans. **(a)**

The first moment about the origin of Binomial distribution is mean of Binomial distribution $E(x) = np$.

End of Solution

30. For the regression equations

$$y = 0.516x + 33.73$$

and

$$x = 0.512y + 32.52$$

the means of x and y are nearly

(a) 67.6 and 68.6 (b) 68.6 and 68.6

(c) 67.6 and 58.6 (d) 68.6 and 58.6

Ans. **(a)**

Given that the regression equation are

$$y = 0.516x + 33.73$$

$$x = 0.512y + 32.52$$

$$0.516x - y = -33.73 \quad ...(i)$$

$$x - 0.512y = 32.52 \quad ...(ii)$$

The regression lines passes through the mean i.e., the point of intersection of eq. (i) and eq. (ii) are (67.6, 68.6)

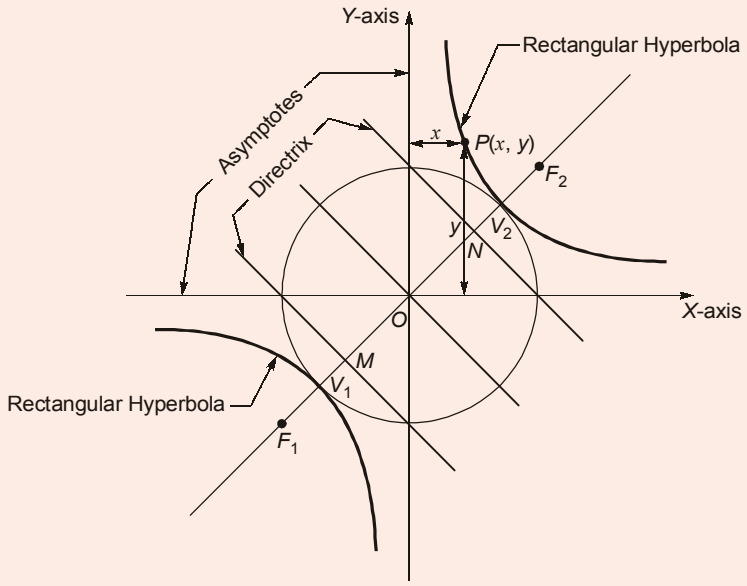
End of Solution

31. In a rectangular hyperbola, if a curve is traced out by a point moving in such a way that the product of its distances from two fixed lines at right angles to each other is a constant, then those fixed lines are called

(a) asymptotes (b) intercepts

(c) holes (d) limits

Ans. **(a)**



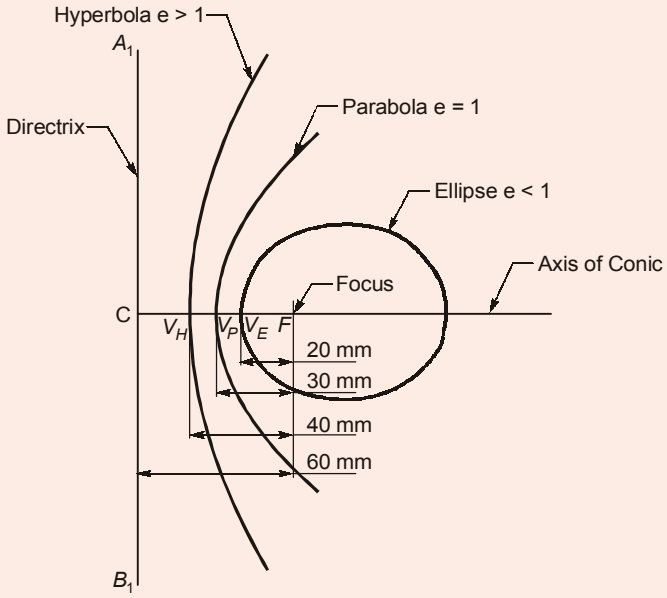
End of Solution

32. The line passing through the focus and perpendicular to the directrix is called

(a) axis (b) vertex

(c) eccentricity (d) conic

Ans. (a)



Axis of conic is the line passing through the focus and perpendicular to the directrix.

End of Solution

33. Dimensions in a series may be placed in any one of the following ways, ***except***

(a) progressive dimensioning
(b) proportional dimensioning
(c) continuous dimensioning
(d) chain dimensioning

Ans. (b)

Dimensions in a series may be placed in any one of the following two ways:

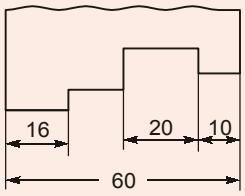


Fig. (i)

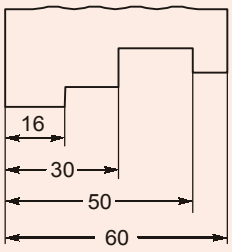


Fig. (ii)

A. **Continuous or chain dimensioning [Fig. (i)]:** Dimensions are arranged in a straight line. And overall dimension is placed outside the smaller dimensions. One of the smaller dimensions (the least important) is generally omitted.

B. **Progressive or parallel dimensioning [Fig. (ii)]:** All dimensions are shown from a common base line. Cumulative error is avoided by this method. This method is referable.

In this question they have asked the way in which dimension in series cannot be placed. Hence by elimination technique, correct answer is (b) proportional dimensioning.

End of Solution

34. Among the effects of design specifications on costs, which one of the following is the most significant that influences the producibility of end product?

(a) Standard size (b) Large tolerance
(c) Breakeven point (d) Cost estimate

Ans. **(b)**

End of Solution

35. Which one of the following is not the best approach for the prevention of product liability?

(a) Analysis and design (b) Quality control
(c) Comprehensive testing (d) Cost

Ans. **(d)**

To prevent product failure or liability analysis, design, Quality control, comprehensive testing are correct approach. Only wrong approach is cost.

End of Solution

36. Which one of the following is **not** the way of estimating the statistical parameters and is integral part of analysis or synthesis tasks when probability of failure is involved?

(a) Propagation of error (b) Propagation of uncertainty
(c) Propagation of weight (d) Propagation of dispersion

Ans. **(c)**

If bearing balls are produced by a manufacturing process in which a diameter distribution is created, we can say upon choosing a ball that there is uncertainty as to size. If we wish to consider weight or moment of inertia in rolling, this size uncertainty can be considered to be propagated to our knowledge of weight or inertia. There are ways of estimating the statistical parameters describing weight and inertia from those describing size and density. These methods are variously called *propagation of error, propagation of uncertainty, propagation of dispersion*. These methods are integral part of analysis or synthesis tasks when probability of failure is involved.

End of Solution

37. In order to limit the seriousness of an accident, emergency controls should be provided with which of the following as determining factors in the location of emergency stops?

(a) Speed and ease of operation (b) Common sense of workers
(c) Nearest exits and checkpoints (d) Supervisors and decision-makers

Ans. **(a)**

Determining factor in the location of emergency stops is speed and ease of operation of the emergency stops.

End of Solution

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38. Human engineering approach is followed to prevent accidents by giving due consideration to physical and mental limitations of the workers by
(a) giving constant attention to how a worker is likely to react rather than how supervisor would like him to react
(b) imposing too many safety rules
(c) not permitting to make safety device or guard inoperative
(d) giving first-aid attention in case of injury

Ans. (a)
Human engineering approach is followed to prevent accidents by giving due consideration to physical and mental limitations of the workers by giving constant attention to how a worker is likely to react rather then how supervisor would like him to react.

End of Solution

39. Which one of the following is **not** an operator error through triggers leading to an accident which confuses and traps into making mistake?
(a) Faulty design or construction of machine tool
(b) Poor housekeeping and cleanliness
(c) Standard operating safety practice
(d) Lack of standardization and identification

Ans. (c)

End of Solution

40. Which one of the following is **not** included in the safety program for achieving good results during the prevention of accidents?
(a) Development of safe working conditions
(b) Promotion of employees participation in safety
(c) Compensation and medical payment
(d) Corrective action when safety rules are ignored

Ans. (c)
Compensation and medical payment is not included in the safety program for achieving good results during prevention of accidents.

End of Solution

41. Which of the following departments ensure the quality of the product?
1. Product design and development
2. Marketing and product planning
3. Packaging and shipping
4. Sales

(a) 1, 2 and 3 (b) 1, 2 and 4
(c) 1, 3 and 4 (d) 2, 3 and 4

Ans. (a)

End of Solution

42. Which of the following are the general subareas of quality control?

1. Off-line quality control
2. Sales/market share
3. Statistical process control
4. Acceptance sampling plans

(a) 1, 2 and 3 (b) 1, 3 and 4
(c) 1, 2 and 4 (d) 2, 3 and 4

Ans. (b)

End of Solution

43. Which of the following steps come under 14-step plan for quality improvement?

1. Ad hoc committee for the zero defects program
2. Cost of quality evaluation
3. Quantity measurements
4. Supervisor training

(a) 1, 2 and 3 (b) 1, 2 and 4
(c) 1, 3 and 4 (d) 2, 3 and 4

Ans. (b)

Step plan for quality improvement (Crosby's 14-step plan):

1. Management commitment
2. Quality improvement team
3. Quality Measurement
4. Cost of quality evaluation
5. Quality awareness
6. Corrective action
7. Ad hoc committee for the zero-defects program
8. Supervisor training
9. Zero-defects day
10. Goal setting
11. Error-cause removal
12. Recognition
13. Quality councils
14. Do it over gain

End of Solution

44. An Average Outgoing Quality (AOQ) is

(a) $\frac{P_a p(N)}{N-n}$ (b) $\frac{P_a p(N+n)}{N}$

(c) $\frac{P_a p(N-n)}{n-N}$ (d) $\frac{P_a p(N-n)}{N}$

where P_a = Probability of accepting the lot
p = Incoming lot quality
N = Lot size
n = Sample size

Ans. (d)

End of Solution

45. Which one of the following is the measure of service quality that correlates with the human factors and behavioural characteristics of service quality?

(a) Number of complementary responses based on human traits in delivery of service
(b) Proportion of income tax returns prepared by an agency that have errors
(c) Shabby appearance of a receptionist in a bank or hotel
(d) Inadequate temperature control in a convention meeting room

Ans. (a)

End of Solution

46. Which of the following factors affect the quality of conformance in construction?

1. Site construction methods
2. Technical specifications
3. Engineering and design process
4. Supervision and control

(a) 1 and 3 (b) 2 and 3
(c) 2 and 4 (d) 1 and 4

Ans. (d)

End of Solution

47. Which of the following considerations are important during inspection of the work in prestressed concrete works?

1. Sheathings are threaded properly including correct threading of couplers and taping of joints
2. Only approved sheathings, HTS strands, anchor heads and wedges are to be used
3. Splicing of reinforcement to be provided at the joints

(a) 1, 2 and 3 (b) 1 and 2 only
(c) 1 and 3 only (d) 2 and 3 only

Ans. (a)

End of Solution

48. The standard deviation σ for sampling in the case of concrete for construction engineering and management is

(a) $\sqrt{\frac{\Sigma\left(X+\bar{X}\right)^2}{N+1}}$ (b) $\sqrt{\frac{\Sigma\left(X-\bar{X}\right)^2}{N+1}}$

(c) $\sqrt{\frac{\Sigma\left(\bar{X}+X\right)^2}{N-1}}$ (d) $\sqrt{\frac{\Sigma\left(X-\bar{X}\right)^2}{N-1}}$

where

$X_1, X_2, X_3, X_4, .., X_n$ = Compressive strengths of the individual cubes

N = Number of cubes tested

$\bar{X}$ = Average of series of compressive strengths values

Ans. (d)

End of Solution

49. Which of the following variations are true in piece part production?

1. Piece-to-piece variation
2. Time-to-time variation
3. Within-piece variation
4. Process-to-process variation

(a) 1, 2 and 4
(b) 1, 3 and 4
(c) 2, 3 and 4
(d) 1, 2 and 3

Ans. (d)

End of Solution

50. Which one of the following is the objective of attribute charts in production process control?

(a) To determine the acceptance criteria of a product before production
(b) To evaluate the quality performance of operating and management personnel
(c) To keep a periodic record of a particular characteristic
(d) To determine the highest quality level

Ans. (b)

End of Solution

51. Which one of the following regions is characterized by sensitive ecosystems, enhanced occurrences of extreme weather events and natural catastrophes?

(a) Mountain region
(b) Evergreen forest region
(c) Tropical region
(d) Tundra region

Ans. (a)

End of Solution

52. Which one of the following is an iterative and evolutionary process for achieving sustainable development?

(a) Flood Control Management (FCM)
(b) Solid Waste Management (SWM)
(c) Integrated Coastal Zone Management (ICZM)
(d) Natural Ecosystem Zone (NEZ)

Ans. (c)

End of Solution

53. Which of the following practices are adopted for river basin water resources management?

1. Soil conservation in catchments of river valley projects and flood-prone rivers
2. Soil and land use surveys
3. Control of shifting cultivation
4. Deforestation

(a) 1, 2 and 4
(b) 1, 3 and 4
(c) 2, 3 and 4
(d) 1, 2 and 3

Ans. (d)

End of Solution

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54. According to the Stokes' law, the rate of settling of the particles depends on the terminal settling velocity v_t which is

(a) $\frac{gd_p^2}{18\mu_a}(\rho_p - \rho_a)\left(1+\frac{2C}{d_pP}\right)$ (b) $\frac{gd_p^2}{18\mu_a}(\rho_p + \rho_a)\left(1-\frac{2C}{d_pP}\right)$

(c) $\frac{gd_p^2}{18\mu_a}(\rho_p - \rho_a)\left(1-\frac{2C}{d_pP}\right)$ (d) $\frac{gd_p^2}{18\mu_a}(\rho_p + \rho_a)\left(1+\frac{2C}{d_pP}\right)$

where, d_p = Particle diameter, ρ_p = Density of particle
ρ_a = Density of air, μ_a = Velocity of air
P = Air pressure, C = Constant

Ans. **(a)**

End of Solution

55. The sound level L is

(a) $\log_{10}\frac{Q_0}{Q}$ (bels) (b) $20\log_{10}\frac{Q}{Q_0}$ (bels)

(c) $\log_{10}\frac{Q}{Q_0}$ (bels) (d) $20\frac{Q}{Q_0}+\log_{10}\frac{Q}{Q_0}$ (bels)

where, Q = Measured quantity of sound pressure or sound intensity
Q_0 = Reference standard quantity of sound pressure

Ans. **(c)**

End of Solution

56. Which one of the following is a hygienic way of disposing solid waste and is more suitable if the waste contains more hazardous material and organic content?

(a) Composting (b) Incineration
(c) Oxidation (d) Subgrading

Ans. **(b)**

End of Solution

57. NEPA stands for

(a) National Ecological Physical Area (b) Natural Environmental Policy Act
(c) National Environmental Policy Act (d) Natural Ecological Primary Area

Ans. **(c)**

End of Solution

58. Which one of the following gases is colourless with strong odour, irritates mucous membranes at common levels, can cause cough, fatigue and interference with lung functions at higher concentration?

(a) Carbon monoxide (b) Hydrogen
(c) Ozone (d) Nitrogen

Ans. **(c)**

End of Solution

59. Basel Convention provides
(a) Indian standards for pollution measurement and prevention
(b) International guidelines to control the transboundary movements of hazardous wastes between different countries
(c) Indian standards for the disposal of municipal and industrial wastes
(d) International standards to categorize pollution in air and wastewater

Ans. **(b)**

End of Solution

60. Which of the following are the suggested ways of reducing NO_X emissions from stationary sources?
1. By reducing the peak temperature.
2. By increasing the availability of N_2 for reaction with O_2.
3. By minimizing the availability of O_2 for reaction with N_2.

(a) 1 and 2 only (b) 1 and 3 only
(c) 2 and 3 only (d) 1, 2 and 3

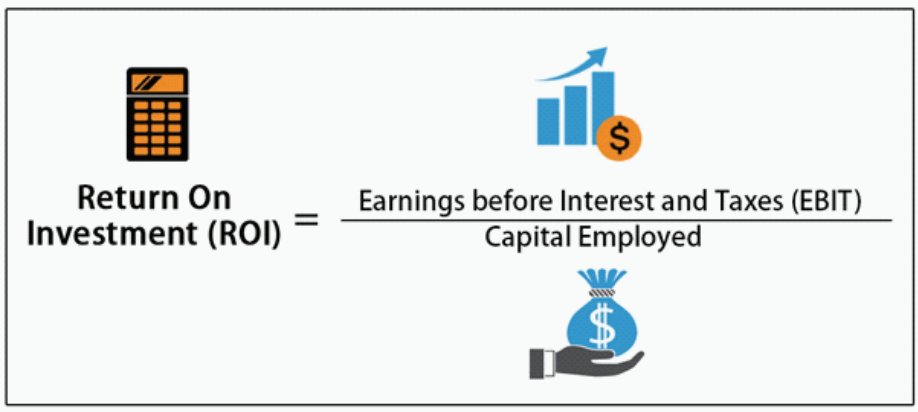
Ans. **(b)**

End of Solution

61. During an assessment of economic viability of the project, the ratio of average annual earnings after tax to the average book investment after depreciation is called
(a) Benefit-Cost Ratio (BCR) (b) Net Present Value (NPV)
(c) Pay-Back Period (PBP) (d) Return on Investment (ROI)

Ans. **(d)**

Return on Investment (ROI) calculates the profitability of the company by measuring the earnings related to the amount of capital invested. Return on investment (ROI) is a ratio between net profit (over a period) and cost of investment (resulting from an investment of some resources at a point in time).



End of Solution

62. Who is responsible for the following activities in a project?
1. Achieving a unity of control over project activities.
2. Having an authority to control project matters and disburse funds from the budget.
3. Having no actual line of authority over workers.

(a) Project Expeditor (b) Project Coordinator
(c) Matrix Manager (d) Project Manager

Ans. **(b)**
A Project Coordinator carries the responsibility of partially managing the project under the supervision of other managers. A Project Coordinator is usually given some sort of limited authority to make decision. He has the financial powers but lacks in authority over the workers.
For larger projects, the Project Manager may have some Project Coordinators reporting to them.

End of Solution

63. The creative technique applied when the available and required inputs as well as the desired outputs are listed, is
(a) Attribute listing (b) Direct dreaming
(c) Black box (d) Delphi

Ans. **(a)**
Attribute listing is a means of getting you to focus on as many attributes of a product or problem as possible. In breaking down the elements of a problem or object, you can look at each in turn and generate new ideas. The technique is particularly useful for considering complex products or processes in that it allows you to consider each feature or stage and look at the associated attributes in detail.

End of Solution

64. The market price per share of a company is ₹125. The dividend per share (DPS) expected a year is ₹12 and DPS is expected to grow at a constant rate of 8% per annum. The cost of the equity capital to the company will be
(a) 17.6% (b) 15.4%
(c) 13.2% (d) 11.8%

Ans. **(a)**

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

$$= 0.096 + 0.08 = 0.176$$

Thus, cost of equity = 17.6%

End of Solution

65. Which one of the following risks can be reduced by investing in projects or acquiring other firms that have a negative correlation with the earnings of the firm?
(a) Investment risk (b) Business risk
(c) Financial risk (d) Portfolio risk

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Ans. **(d)**

When two variables are negatively correlated, one variable decreases as the other increases, and vice versa. Negative correlations between two investments are used in risk management to diversify, or mitigate, the risk associated with a portfolio.

End of Solution

66. An individual investor who invests in the e-project usually during an early stage is

(a) corporate strategic investor (b) founder capital
(c) angel investor (d) venture capital

Ans. **(c)**

An angel investor (also known as a private investor, seed investor or angel funder) is a high net worth individual who provides financial backing for small startups or entrepreneurs, typically in exchange for ownership equity in the company. It is noteworthy to appreciate that angle investor invests during the early stage of a project.

End of Solution

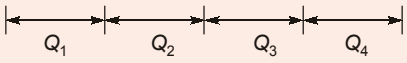
67. If the nominal rate of interest is 12% and is compounded quarterly, the effective rate of interest per annum will be nearly

(a) 10.8% (b) 12.6%
(c) 14.4% (d) 16.2%

Ans. **(b)**

Nominal rate of interest = 12%

It is compounded quarterly



Take original value = X

Thus, interest for a quarter $= \left(\frac{0.12}{4}\right)X$

Hence, value after a quarter $= \left(1+\frac{0.12}{4}\right)X$

We have four quarters,

Hence, value after a year $= (1+0.03)^4 X = 1.1255X$

Thus, effective rate of return $\left(\frac{1.1255X - X}{X}\right)\times 100 = 12.55\%$

End of Solution

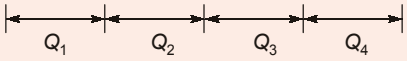
68. In a bank, deposits can be made for periods ranging from 6 months to 10 years. Every quarter, an interest will be added on to the principal. The rate of interest applied is 9% per annum for periods from 12 months to 23 months and 10% per annum for periods from 24 months to 120 months. An amount of ₹1,000 invested for 2 years to grow, will be nearly

(a) ₹1,218 (b) ₹1,334
(c) ₹1,414 (d) ₹1,538

Ans. **(a)**

The person invests for 2 years in 24 months.
Thus, he has to compensated with 10% per annum rate which is compounded quarterly.
Let original value invested be X.

$$\text{Value after one quarter} = \left(1+\frac{0.10}{4}\right)X$$



Hence, value after eight quarter i.e., 2 years

$$= \left(1+\frac{0.10}{4}\right)^8 X = 1.2184X$$

Here, X = 24000
Thus, value after 2 years = ₹1218

End of Solution

69. A company has issued ₹20 million worth of non-convertible debentures, each at a face value of ₹100 at the rate of 12%. Each debenture is redeemable at a premium of 5%, after 10 years. If the net amount realized is ₹95 and tax rate is 40%, the cost per debenture will be

(a) 5.8% (b) 6.6%
(c) 7.4% (d) 8.2%

Ans. **(d)**

$$\left(\frac{i(1+t)+\dfrac{RV-NP}{N}}{\dfrac{PV+NP}{2}}\right)$$

Here, $i = 12$
$t = 0.4$
$RV = 100\ (1 + 0.005) = 105$
$N = 10$

Thus, substituting

$$\left(\frac{12\times(1-0.4)+\dfrac{105-95}{10}}{\left(\dfrac{105+95}{2}\right)}\right)\times 100$$

$$= \left(\frac{7.2+1}{200/2}\right) = \left(\frac{8.2}{100}\right)\times 100 = 8.2\%$$

End of Solution

70. A cybernetic control system that acts to reduce deviations from standard is called
(a) a negative feedback loop (b) a positive feedback loop
(c) a closed loop (d) an open loop

Ans. **(a)**

End of Solution

71. In which one of the following types of bonds, the bond formation is by free moving electrons in an array of positive ions?
(a) Homopolar bond (b) Electrostatic bond
(c) Metallic bond (d) Covalent bond

Ans. **(c)**
Metallic bond is formed when atoms give up their electrons and become positive ions. So the bond is formed between free moving electrons and positive ions.

End of Solution

72. If a pair of one cation and one anion is missing in an ionic crystal such that those pairs of ions are equal to maintain electrical neutrality, then that pair of vacant sites is called
(a) Schottky imperfection (b) Pair of vacancies
(c) Frenkel defect (d) Point imperfection

Ans. **(a)**
Schottky defect occurs when a pair of cation and anion is missing from crystal such that electrical neutrality is maintained.

End of Solution

73. Which of the following are the characteristics of covalent compounds?
1. They are mostly gases and liquids.
2. They are usually electric insulators.
3. They are directional in nature.
4. They are insoluble in polar solvents like water but are soluble in non-polar solvents.
(a) 1, 2 and 3 only (b) 1, 2 and 4 only
(c) 1, 3 and 4 only (d) 1, 2, 3 and 4

Ans. **(d)**

End of Solution

74. The photoelectric current depends on which of the following factors?
1. The frequency of the incident light.
2. The intensity of the incident light.
3. The potential difference between the electrodes.
4. The photosensitivity of the non-metal.
(a) 1, 2 and 4 (b) 1, 2 and 3
(c) 1, 3 and 4 (d) 2, 3 and 4

Ans. **(b)**
Photoelectric current does not depend upon photosensitivity of the non-metal.

End of Solution

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75. Which one of the following statements is correct regarding ductile fracture?
(a) Fractured surfaces are crystalline in appearance.
(b) There is virtually no reduction in cross-sectional area during fracture,
(c) Fracture takes place after necking with little sound.
(d) Percentage elongation is about 60% prior to fracture occurs.

Ans. **(c)**
Ductile fracture takes place after prolonged plastic deformation after necking has taken place.

End of Solution

76. Which of the following factors are affecting critical shear stresses?
1. Purity of metals reduces the critical shear stress.
2. Surface films greatly enhance the critical shear stress.
3. Rise in temperature.
4. Rate of deformation and the extent of initial deformation also help in raising the critical shear stress.

(a) 1, 2 and 3 only
(b) 1, 2 and 4 only
(c) 1, 3 and 4 only
(d) 1, 2, 3 and 4

Ans. **(c)**
Critical shear stress does not depend upon the surface films.

End of Solution

77. Which one of the following types of materials is having high remanence, coercivity and saturation flux density as well as low permeability and high hysteresis energy losses?
(a) Soft magnetic materials
(b) Hard magnetic materials
(c) Hard electrical materials
(d) Soft electrical materials

Ans. **(b)**
Properties of Hard magnetic material:
1. High retentivity
2. High coercivity
3. High hysteresis loss
4. Low permeability

End of Solution

78. Polymers having strong primary bonds throughout, often formed by condensation polymerization, and their structure resembles one large molecule, are known as
(a) thermoplastic polymers
(b) thermosoftening polymers
(c) thermosetting polymers
(d) random polymers

Ans. **(c)**
Condensation polymers are thermosetting polymers.

End of Solution

79. An FET is a semiconductor device with the output current controlled by an electric field and its current is carried predominantly by one type of carriers. It is known as

(a) junction transistor (b) unipolar transistor
(c) MOSFET (d) IGBT

Ans. **(c)**

MOSFET is a semiconductor device with output current controlled by an electric field and its current is carried predominantly by one type of carriers.

End of Solution

80. Which one of the following is the trade name of polycarbonates?

(a) Alathon (b) Baylon
(c) Bexphane (d) Cycolac

Ans. **(b)**

End of Solution

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(c) Copyright Infringement (d) No Derivative Works

Ans. **(c)**

End of Solution

82. The Ethernet designed by IEEE to compete with LAN protocols which can transmit data ten times faster at a rate of 100 Mbps is

(a) fast Ethernet (b) bridged Ethernet
(c) switched Ethernet (d) full-duplex Ethernet

Ans. **(a)**

Fast Ethernet created by IEEE - under the name 802.3u - can transmit data 10 times faster at the rate of 100 Mbps. 100 BASE-T or IEEE 802.3u aims also include competing with Fiber Channel, compatibility with Standard Ethernet, etc. However, the length of the cable - range - in copper based Fast Ethernet is lesser as compared to Fiber Mode.

End of Solution

83. IEEE standard protocol which defines a wireless Personal Area Network (PAN) operable in a room is

(a) Wi-Fi (b) Bluetooth
(c) Infrared (d) Wireless LAN

Ans. **(b)**

Bluetooth or IEEE 802.15.1 Standards came up as cost-effective (Wireless Personal Area Network (W-PAN) Technology-Type with one Primary Node and maximum Seven Secondary

Nodes, named after Herald Blatand. While IEEE 802.11 standards or Wi-Fi is primarily a solution for Wireless Local Area Network (W-LAN). Frequency range for Bluetooth is 2.400 GHz to 2.485 GHz while for Wi-Fi it is 2.40 GHz to 5.0 GHz.

End of Solution

84. Which one of the following points is a private switching station that connects the national internet service provider's network and operates at a high data rate up to 600 Mbps?

(a) Locking point
(b) Peering point
(c) Hub point
(d) Modem point

Ans. **(b)**

National Internet Service Providers (ISPs) are connected together through Private Switching Stations which are referred to as Peering Points or even Internet Exchange Points (IXPs) normally operating at high data rate say upto 600 Mbps. And the benefits in the direct interconnection through them include high data rate, better routing efficiency and cost-effectiveness.

End of Solution

85. Which one of the following is the nodal department to implement public internet access program and rural internet connectivity by converting its offices as multi-service centres?

(a) Department of Electronics and Information Technology
(b) Department of Information and Broadcasting
(c) Department of Telecommunication
(d) Department of Posts

Ans. **(d)**

"A total of 150,000 Post Offices are proposed to be converted into multi service centres. Department of Posts would be nodal department to implement Public Internet Access Programme". (digitalindia.gov.in, vikaspedia.in, etc.)

End of Solution

86. Which one of the following is **not** the vision area of Digital India as a program to transform India into a digitally empowered society and knowledge economy?

(a) Infrastructure as utility to every citizen
(b) Governance and services on demand
(c) Free Wi-Fi access
(d) Digital empowerment of citizens

Ans. **(c)**

Three key vision area of Digital India are:

1. Digital Infrastructure as a Core Utility to Every Citizen.
2. Governance and Services on Demand, and
3. Digital Empowerment of Citizens.

End of Solution

87. Infrastructure aspects provided by the Government of India in formation of National e-Governance Plan for storage of data and hosting applications, network connectivity and capacity building respectively are

(a) SDC, SWAN and NISG
(b) SWAN, SDC and NISG
(c) SDC, NISG and SWAN
(d) SWAN, NISG and SDC

Ans. **(a)**

State Data Centres (SDCs): Secure Data Storage, hosting applications and online delivery of services, remote management and service integration. etc.

State Wide Area Networks (SWAN): As the converged backbone network for data, voice and video communication throughout any State/UT, and

National Institute for Smart Government (NISG): Capacity building, consulting services, project management and talent acquisition.

End of Solution

88. Which one of the following is not the characteristic of Good Governance and e-Governance that are closely linked and depend on each other?

(a) Accountable
(b) Transparent
(c) Consciousness
(d) Consensus-oriented

Ans. **(c)**

The World Bank earlier identified four basic elements of Good Governance:

1. Accountability
2. Participation
3. Predictability, and
4. Transparency

Then, there came expansion of these or addition to these either by World Bank itself or by even other institutions like UNDP which include consensus oriented, responsive and inclusive, Rule of Law, effective and efficient, etc. Online-participation also much helps in consensus-building.

End of Solution

89. Which one of the following is **not** the skill needed in the workplace of the future for inventive thinking using information and communication technology in education?

(a) Adaptability
(b) Responsibility
(c) Curiosity and creativity
(d) Risk-taking

Ans. **(b)**

Skills needed for innovative thinking in Digital Age:

1. Adaptability/Ability to manage complexity
2. Curiosity-desire to know as fuel for life-long learning.
3. Creativity-using the imagination to develop new and original things, and
4. Risk taking-the willingness to place something valued in a position or situation where it could be exposed to damage or loss (say for quantum leaps).

(Reference: 'enGauge *21st Century Skills: Digital Literacies for a Digital Age*': Cheryl Lemke).

End of Solution

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3 AIR Paramjeet Kr. Dubey


5 AIR Jayesh Atreya


7 AIR Chirag Rathi


7 AIR Shreyans Mehta


9 AIR Vishal Tiku


10 AIR Asif Reza Khan

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2 AIR Anshul Goel


3 AIR Ankit Kulhari


4 AIR Siddarth Wadhwa


5 AIR Nilesh Raj


5 AIR Patel Charmin B.


7 AIR Aakash Verma


10 AIR Mahesh S. Yadav

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2 AIR Kunal Gururani


2 AIR Mukesh Poonia


4 AIR Dakshesh kumar


5 AIR Pradeep Kumar


5 AIR Sayantan Bh.


7 AIR Deepika Kumari


7 AIR Deepita Roy


7 AIR Shubham Mittal


10 AIR Geeth George

EC — 8 in Top 10


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3 AIR Shubham Maurya


4 AIR Chaitanya Kumar


6 AIR Priyanshu Sharma


7 AIR Ankit


7 AIR Saikiran Cholleti


9 AIR J. Srinivasa Reddy


9 AIR Ranjit Kumar Singh

CS — 7 in Top 10


1 AIR Pranav Sharma


2 AIR Jay Bansal


3 AIR Nipun Mittal


3 AIR Prateek Agarwal


6 AIR Hari Shrawgi


8 AIR T D Sai Sravan Reddy


9 AIR Ravi Shankar M.

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3 AIR Vineet Goswami


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4 AIR Rajbhawani Rajawat


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7 AIR Saish Mohit Kalaskar


7 AIR Shweta Yadav


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9 AIR Bandaluppi Sreekar

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90. The pedagogy which involves productive learning and finding new solutions to problems, where manipulation of existing information and creation of real-world products are possible with ICT, is called

(a) collaborative pedagogy
(b) creative pedagogy
(c) integrative pedagogy
(d) evaluative pedagogy

Ans. **(b)**

Creative Learning: Promotes manipulation of existing information and creation of real-world products.

Integrative Learning: Overcomes artificial separation between disciplines and links theory and practice, or even thematic learning.

Evaluative Learning: Student directed and diagnostic rather than static approach to learning.

Active Learning: Small group of learners actively involve in activities and pace of learning, and

Collaborative learning: More collaboration and interaction between students, teachers, experts, etc.

End of Solution

91. The basic difference between a professional and an amateur is

(a) a professional is someone who is connected with a job that needs special training or skill, while an amateur is someone who works in multi-dimensions without any specialization
(b) a professional is clear in thinking and focused on the job, while an amateur is confused and distracted from the job
(c) a professional does high quality work/job in a specific area, while an amateur is associated with specific area with lowest pay
(d) a professional remains positive and achieves despite facing grievances, while an amateur does work efficiently due to many imagined grievances

Ans. **(a)**

End of Solution

92. 'Euthanasia' refers to the

(a) loyalty of the people that take pride in being part of their organization and care for the organization above their own well-being
(b) ills in the society that are caused by ignorance and lack of respect for the laws of the land
(c) emotional intelligence to understand how people perform various functions
(d) killing of a terminally ill person suffering acutely with no hope of survival

Ans. **(d)**

End of Solution

93. 'Utilitarianism' in the professional ethics is
(a) an acquired habit that helps to lead a rational life
(b) a skill to solve a current ethical problem by comparing it with similar problems from the past and their outcome
(c) a right of activists to decide their own duties
(d) a judgment of an action by the consequences of that action

Ans. (d)

End of Solution

94. In the professional ethics, the degree of safety proposed to be attained varies with
(a) design, duration and product
(b) cost of risk, design and utility
(c) cost of risk, perception and utility
(d) product, perception and cost of risk involved

Ans. (b)

End of Solution

95. The basic ethical principle of 'Beneficence' states that
(a) all our thoughts and actions must be directed to ensure that others benefit from these thoughts and actions
(b) our actions must result in the least harm to the others
(c) we should not impose our views on others
(d) our actions must be fair to everyone

Ans. (a)

End of Solution

96. Which of the following are the main functions of WTO?
1. To organize meetings of member countries to arrive at trade agreements covering international trade.
2. To ensure that member countries conduct trade practices as per agreements agreed upon and signed by the member countries.
3. To provide a platform to negotiate and settle disputes related to international trade between and among member countries.

(a) 1 and 2 only (b) 1 and 3 only
(c) 2 and 3 only (d) 1, 2 and 3

Ans. (d)

End of Solution

Directions: Each of the next **four (4)** items consists of two statements, one labelled as '**Statement (I)**' and the other as '**Statement (II)**'. You are to examine these two statements carefully and select the answers to these items using the code given below:

Code:

(a) Both Statement (I) and Statement (II) are individually true and Statement (II) is the correct explanation of Statement (I)

(b) Both Statement (I) and Statement (II) are individually true but Statement (II) is not the correct explanation of Statement (I)

(c) Statement (I) is true but Statement (II) is false

(d) Statement (I) is false but Statement (II) is true

97. **Statement (I):** If the project influence is more in decision-making for the project, then the arrangement is considered a strong matrix.

Statement (II): If functional departments are seen to be influencing the decision-making more, the arrangement is considered a weak matrix.

Ans. **(b)**

In the strong matrix or project matrix organization structure, the project manager has most of the power, resources and control over the work. The functional manager is there to add support, technical expertise, look after HR issues etc…

A weak matrix organizational structure resembles the characteristics of a functional organizational structure. In weak matrix organizations, the project managers have limited authority. Their role is part-time and no administrative staff report to them. Here, the functional manager controls the project budget.

End of Solution

98. **Statement (I):** Raw materials are taken as traded items and their values at domestic and world prices are estimated.

Statement (II): Raw materials, which have a high value-to-volume ratio and involve proportionately high transport cost and are imported, are regarded as non-traded items.

Ans. **(c)**

Non-tradable items are those which are not traded internationally. They include items such as services where the demander and producer must be in the same location, and commodities which have low value relative to either their weight or volume. In such cases the transportation charges prevent producers from profitably exporting their goods.

End of Solution

99. **Statement (I):** Information and Communication Technologies (ICTs) can facilitate improved service delivery and more efficient internal operations.

Statement (II): ICTs can create new opportunities for the marginalized and the vulnerable of society but do not represent a panacea for all development problems.

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Civil Engineering

10 in Top 10

216 Selections out of 233 vacancies

93% of Total Selections are from MADE EASY

1 AIR — ABUZAR GAFFARI — Classroom T. S.

2 AIR — Pramit Debmallik — Classroom Course

3 AIR — Amarjeet — Classroom Course

4 AIR — Aman Gulia — Classroom Course

5 AIR — Ayush Chandra Dwivedi — Postal Course

6 AIR — Kabil Bhargava — Online T. S.

7 AIR — Abhishek Kumar — Classroom Course

8 AIR — Yogesh Kumar — Classroom Course

9 AIR — Ankit Kumar — Classroom Course

10 AIR — Tushar Garg — Classroom Course

Mechanical Engineering

10 in Top 10

85 Selections out of 87 vacancies

98% of Total Selections are from MADE EASY

1 AIR — BHOSALE H. DNYANESHWAR — Classroom Course

2 AIR — Sahil Goyal — Interview Course

3 AIR — Kumar Chandan — Classroom Course

4 AIR — Saurav Kumar — Classroom Course

5 AIR — Himanshu Verma — Classroom Course

6 AIR — Ch. Pushpak Pramod — Classroom Course

7 AIR — Manish Rajput — Classroom Course

8 AIR — Hemant Kumar Singh — Online T. S.

9 AIR — Sabapara D. Manishbhai — Interview Course

10 AIR — Sumit Bhamboo — Classroom Course

Electrical Engineering

10 in Top 10

79 Selections out of 86 vacancies

92% of Total Selections are from MADE EASY

1 AIR — KARTIKEYA SINGH — Classroom Course

2 AIR — Shambhavi Tripathi — Classroom Course

3 AIR — Abhishek Anand — Classroom Course

4 AIR — Ankit Tayal — Classroom Course

5 AIR — Kumar Mayank — Classroom Course

6 AIR — Ritesh Lalwani — Classroom Course

7 AIR — Kartikey Singh — Online T. S.

8 AIR — Anshuman Mitra — Classroom T. S.

9 AIR — Deepita Roy — Classroom Course

10 AIR — Ankita Sharma — Classroom Course

E&T Engineering

10 in Top 10

85 Selections out of 88 vacancies

97% of Total Selections are from MADE EASY

1 AIR — RAJAT SONI — Classroom Course

2 AIR — Ankush Mangla — Classroom Course

3 AIR — Rohit Kumar Singhal — Classroom Course

4 AIR — Amir Khan — Classroom Course

5 AIR — Y. Naga Rahul — Classroom Course

6 AIR — Janga Srinivasa Reddy — Classroom Course

7 AIR — Rahul Jain — Classroom Course

8 AIR — Kuldeep Kumar — Classroom Course

9 AIR — Shubham Karnani — Classroom Course

10 AIR — Gaurav Srivastava — Classroom Course

Ans. **(b)**

Statement (I) brings out a broad general utility or positive outcome of Information and Communication Technology (ICT), while Statement (II) puts-forth a real limitation of ICT despite some important utility. So, both statements are only individually true.

End of Solution

100. **Statement (I):** Long-term sustainability of e-Governance projects does not depend on financial viability, especially if they are to be implemented in the Public-Private Partnership (PPP) mode.

Statement (II): Front-end e-services are possible without back-end computerization.

Ans. **(d)**

Long-term sustainability of e-Governance Projects without financial viability is neither possible nor feasible. While, Front-end e-services at-times are possible without back-end computerisation, though not that feasible, or without integrative approach e-service cannot work well. For example, even if some policy approvals at back end are not computerised, even then some front-end service applications are possible to be brought.

End of Solution

■■■■