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ESE – 2019
(PRELIMS)

Questions with Detailed Solutions

GENERAL STUDIES & ENGINEERING APTITUDE

SET - A

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GENERAL STUDIES AND ENGINEERING APTITUDE

SET A

Subject wise weightage

Subjects	No. of Questions
Current Issues & Background Concepts of Social Economic and Industrial development	11
Engineering Aptitude	10
Engineering Mathematics and Numerical Analysis	05
General Principles of Design, Drawing, Importance of Safety	06
Standards and Quality practices in production, construction, maintenance and services	08
Basics of Energy and Environment	12
Basics of Project Management	11
Basics of Material Science and Engineering	15
Information and Communication Technologies (ICT)	10
Ethics and Values in Engineering profession	12

Subject Experts,
ACE Engineering Academy

01. Which of the following is ***not*** a component of 'Capital Receipts'?

(a) Market borrowings including special bonds

(b) External loans raised by the Central Government from abroad

(c) Receipts from taxes on property and capital transactions

(d) Provident Funds (State Provident Funds and Public Provident Fund)

Ans: (c)

Solution:

Capital Receipts are the receipts which are the form of market borrowings, borrowings from banks, provident funds, etc., tax receipts are part of revenue receipts.

Topic: Public Finance ; Difficulty level - Easy; Text Book Reference - Pg 45 & Class notes

End of Solution

02. Which one of the following statement is correct with respect to the '***societal development***'?

(a) Behaviour grows into habits, habits into tradition and tradition becomes custom

(b) Customs grow into mores and mores grow into custom

(c) Behaviours grow into customs and customs grow into traditions

(d) Folkways grow into tradition and traditions grow into customs

Ans: (d)

Solution:

Folkways are patterns of conventional behaviour in a society, tradition is a practice, customs are derived from social norms which regulates proper and acceptable behaviour.

Difficulty level - Tough, **Topic:** Social Development

End of Solution

03. Which one of the following statement is correct with respect to '*the convergence theory*' on social change?

(a) The societal adaptive culture is changing more slowly

(b) As societies become modernized, they begin to resemble one another more closely

(c) The developed countries show more growth in social changes than the less developed countries

(d) Strong opposition by old people retards the social change

Ans: (b)

Solution:

Convergence theory presumes that as a nation moves from early stage of industrialisation towards rapid industrialisation. They begin to resemble each other in terms of societal norms and technology.

Difficulty level - Moderate, **Topic:** Social Development

End of Solution

04. With respect to the conduct and performance of a company, '*perfect competition*' refers to
(a) Large number of small firms producing differentiated products
(b) Complete freedom in economic life and absence of rivalry among firms
(c) Many companies selling similar products with free entry
(d) Sole producer selling a distinct product

Ans: (c)

Solution:

Under perfect competition many companies sell similar products, compete against each other and there is a free entry and exit to the market, sole producer selling a distinct product is a characteristic of monopolistic competition.

Topic: Micro Economics : Types of Market; Difficulty level: Moderate; Txt Bk Reference - Pg 138

End of Solution

05. The cheapest method of marketing of securities with the only cost incurred being on sending '*letters of rights*' to existing holders is
(a) Public issue through prospectus method
(b) Offer for sale method
(c) Rights Issue
(d) Subscription by inside coterie method

Ans: (c)

Solution: Rights letter is a formal document informing current share holders their right to buy rights issue.

Topic: Financial Markets Difficulty level: Tough & Class discussion on IPO

End of Solution

06. '*Fiscal policy*' means
(a) Balancing the revenue collection and expenditure
(b) Establishing equilibrium between demand and supply of goods and services
(c) Use of taxation, public borrowing and public expenditure by Government for purposes of 'stabilization' or 'development'
(d) Deficiency as an instrument of growth

Ans: (c)

Solution:

Fiscal policy is composed of several parts, they include
1. Tax policy
2. Expenditure policy
3. Investment and disinvestment strategies
4. Debt and surplus management

Topic: Public Finance : Fiscal Policy; Difficulty level: Moderate; Text Book Reference - Pg 48 & Class notes

End of Solution

07. Which of the following come under the offerings of 'MUDRA' Bank?

(a) Portfolio Credit Guarantee
(b) Credit for large industries
(c) MUDRA Card
(d) Credit Enhancement

Select the correct answer using the codes given below:

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

Ans: (b)

Solution:

MUDRA Bank does not offer credit facilities to large industries.

MUDRA stands for Micro Units Development and Refinance Agency Ltd.

Topic: Banking ; Difficulty level: Easy; Text Book Reference - Pg 26 & Class notes

End of Solution

08. Which of the following is/are the key reasons for encouraging start up Enterpreneurship?

1. Innovations
2. Focusing on service industry
3. Bringing the values of Proactivity into the society

Select the correct answer using the codes given below:

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

Ans: (c)

Solution:

The five key reasons for encouraging entrepreneurship

1. Innovations
2. New jobs and economic growth
3. Bringing new competitive dynamics into the economic system
4. Promoting research - innovation system
5. Bringing values of proactivity into the society

Topic: Industrial Sector: Entrepreneruship & Skill Development Difficulty level: Moderate; Class discussion

End of Solution

09. Which of the following are the main objectives of Gold Monetization Scheme launched in the country?

1. To monetize gold holdings in the country
2. To increase export of gold from the country
3. To reduce India's import bill
4. To meet the targets of reduction in fiscal deficit

Select the correct answer using the codes given below:

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

Ans: (d)

Solution:

The objective of gold monetization scheme is to reduce Current Account Deficit (CAD) through reduction of Gold Import and to monetize gold holding in the country.

Topic: Gold Monetization ; Difficulty level: Easy Text Book reference - Pg 38 & Class notes & Class discussion

End of Solution

10. A person travelled by car 70 km towards north to A then covered 30 km turning left to B. Again he turned towards left and travelled 110 km to C. Then he cycled at the rate of 10 km/hour towards the starting point. The time taken by him to reach the starting point from C will be

(a) 3 hours (b) 5 hours (c) 7 hours (d) 21 hours

Ans: (b)

Solution:

Let standing point is X

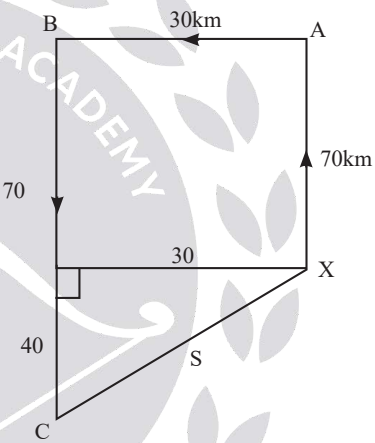
Then CX = $\sqrt{40^2 + 30^2}$

= 50km

Then, time taken to travel

The distance CX = $\frac{D}{S} \Rightarrow \frac{50}{10}$ or 5 hours

$\therefore$ Answer choice is b



End of Solution

11. A student purchases some books for Rs.1600. If he had bought 8 more books for the same amount, each book would cost Rs. 10 less. The number of books he buys is

(a) 30 (b) 32 (c) 34 (d) 36

Ans: (b)

Solution:

Let no. of books purchased initially = x

Then, no of books purchased at new price = (x + 8)

Then,

Initial price of book – New price of book = 10

$\frac{1600}{x} - \frac{1600}{x+8} = 10$ .....(1)

going by the options, only choice (b)

satisfies the equation (1)

End of Solution

12. A hemisphere depression is cut out from one face of the cubical wooden block such that the radius ***r*** of the hemisphere is equal to half of the edge of the cube. What will be the surface area of the remaining solid?

(a) $2r^2(\pi+24)$ (b) $r^2(\pi+24)$ (c) $2r^2(\pi+36)$ (d) $r^2(\pi+36)$

Ans: (b)

Solution:

Let, edge of the cube = 2r

Then, surface area of the cube = $6(2r)^2$ or $24\,r^2$

Radius of the hemi-sphere = r [half of the edge of the cube]

Then, surface area of hemi-sphere = $2\pi r^2$

surface area of the remaining solid = $24r^2 - \pi r^2 + 2\pi r^2 = 24r^2 + \pi r^2 = r^2(24 + \pi)$ sq. units

[Note: πr^2 is subtracted because an area equal to area of circle with radius 'r' is cutoff]

End of Solution

13. A rod of length ℓ is to be divided into two parts, such that if 5 times the smaller portion is added to half of the larger portion, it will always be less than ℓ. This can be achieved by taking length of the larger portion more than

(a) $\frac{9}{10}\ell$ (b) $\frac{7}{8}\ell$ (c) $\frac{6}{7}\ell$ (d) $\frac{5}{6}\ell$

Ans: (a)

Solution:

We need to go by the options

1st option:

(i) Let ℓ = 100 units

smaller portion = 100 units

larger portion = 90 units

now, $5(\text{small portion}) + \frac{1}{2}(\text{larger portion})$

$\Rightarrow 5\,(10) + 45 \Rightarrow 95$ units

(ii) Let smaller portion = 8, larger portion = 92

then, $5(8) + \frac{1}{2}(92) = 86$ units

both the set of values satisfy the given condition.

End of Solution

14. Which of the following conditions hold good for a train which crosses the bridge of length ℓ in time t_1 and crosses another bridge of length $\frac{\ell}{2}$ in time t_2?

(1) $t_2 = \frac{t_1}{2}$

(2) $2t_2 > t_1$

(3) $t_2 < \frac{t_1}{2}$

(4) speed of train is $\frac{\ell}{10}$ if $t_1 - t_2 = 5$

Select the correct answer using the codes given below:

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

Ans: (b)

Solution:

Let, length of the bridge = 200m (in 1st case)

Length of the train = 200m

Time taken to cross the bridge = 10sec (1st case)

Then, speed of the train $= \frac{D}{T} \Rightarrow \frac{200+200}{10} \Rightarrow 40$m/sec

2nd case: length of the bridge $= \frac{1}{2}(200\text{m})$ or 100m $= 7.5$ sec

Time taken to cross the bridge $= \frac{200+100}{40}$

Now, $t_1 = 10\text{sec}$

$t_2 = 7.5\text{sec}$

$\therefore 2t_2 > t_1$

Explanation for option 4: difference in the distance covered in the process of crossing 1st bridge & 2nd bridge $= \frac{\ell}{2}$ difference in time taken = 5sec

$$\therefore \text{ sp of the train } = \frac{\text{difference in distance}}{\text{difference in time}}$$

$$= \frac{\left(\frac{\ell}{2}\right)}{5} \Rightarrow \frac{\ell}{10}$$

End of Solution

15. A tourist covers half of his journey by train at 60 km/h, half of the remainder by bus at 30 km/h and the rest by cycle at 10 km/h. Average speed of the tourist during the journey is

(a) 36 km/h (b) 33 km/h (c) 24 km/h (d) 18 km/h

Ans: (c)

Solution:

Let distance = x km

$$\text{Then, any speed } = \frac{\text{total distance covered}}{\text{total time taken}}$$

$$= \frac{x}{T_1 + T_2 + T_3}$$

$$= \frac{x}{\frac{\left(\frac{x}{2}\right)}{60} + \frac{\left(\frac{x}{4}\right)}{30} + \frac{\left(\frac{x}{4}\right)}{10}}$$

$$= 24 \text{ Km/hr}$$

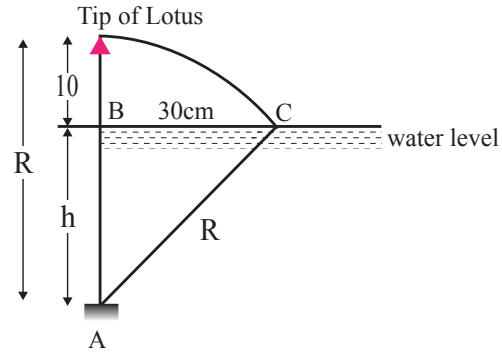
End of Solution

16. In a lake, the tip of a bud of lotus is seen 10 cm above the surface of water. Forced by the wind, it gradually moved, and just submerged at a distance of 30 cm. The depth of water at the root of the lotus plant will be

(a) 40 cm (b) 50 cm (c) 60 cm (d) 70 cm

Ans: (a)

Solution:



The lotus will bend wind force.

Just at the time of submergence of tip of lotus, it will have the circular path.

Say, R = hight of tip of lotus from its root.

h = The depth of water at the root of the lotus plant.

According to pythogorous theorem, for the triangle ABC

$R^2 = h^2 + 30^2$

$R^2 = (R - 10)^2 + 30^2$

$R^2 = R^2 + 10^2 - 2\,(10)\,(R) + 30^2$

$2R = 30^2 + 10^2$

$20R = 900 + 100$

$R = \frac{1000}{20} = 50$ $\quad h = 50 - 10 = 40\text{cm}$

End of Solution

17. A man sold a chair and a table together for Rs. 7,600, thereby making a profit of 25% on the chair and 10% on the table. By selling them together for Rs. 7,500 he would make a profit of 10% on the chair and 20% on the table. Then the cost price of chair and table will be

(a) Rs. 3000 and Rs. 4000 (b) Rs. 3500 and Rs. 4000

(c) Rs. 3000 and Rs. 3500 (d) Rs. 3500 and Rs. 3500

Ans: (c)

Solution:

Let cost of the chair = Rs. x

Cost of the table = Rs. y

Then, 1.25x + 1.1y = Rs. 7600 .....(1)

1.1x + 1.2y = Rs. 7500 .....(2)

solving (1) & (2)

x = Rs. 3000, y = Rs. 3500 [Answer choice is c]

Alternate method: take the help of choice going by 3rd choice

3000 (1.25) + 3500(1.1) = 7600

3000(1.1) + 3500(1.2) = 7500

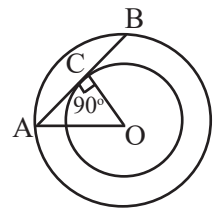
End of Solution

18. In two concentric circles, a chord length 80 cm of larger circle becomes a tangent to the smaller circle whose radius is 9 cm. The radius of the larger circle will be

(a) 13 cm (b) 41 cm (c) 52 cm (d) 75 cm

Ans: (b)

Solution:



Let AB be the chord of bigger circle

Then , AB is tangent to the smaller circle

'O' is the centre of the 2 circles

OC is the radius of the smaller circle

OA is the radius of the larger circle

AC = 40, half of the radius drawn at chord. The point of tangency makes an angle of 90^o

$OA = \sqrt{40^2 + 9^2} = 41cm$

End of Solution

19. Professionals who breach the '*duty of care*' are liable for injuries their negligence causes, This liability is commonly referred to as

(a) Professional offense (b) Professional negligence

(c) Professional misdeed (d) Professional malpractice

Ans: (b)

Solution:

Professional negligence is a breach of the duty of care between **professionals** and their clients. The duty of care is a common law arrangement where the client expects a level of professionalism and standards commonly held by those in the profession.

Professional offence is an organized crime and an intentional act on the part of the professional

Professional misdeed is a wrong - an immoral deed. or illegal deed in the profession

Professional malpractice

An act or continuing conduct of a professional which does not meet the standard of professional competence and results in provable damages to his/her client or public. Such an error or omission may be through negligence, ignorance (when the professional should have known), or intentional wrongdoing. However, malpractice does not include the exercise of professional judgment even when the results are detrimental to the client.

End of Solution

20. Information used in a business, generally unknown to the public, that the company has taken strong measures to keep confidential is called

(a) A patent (b) A copyright (c) A trade secret (d) A trade mark

Ans: (c)

Solution:

A trade secret is confidential information held secret by an organization and not shared with public. It fall under the category of proprietary information. The other three are covered through a legal protection.

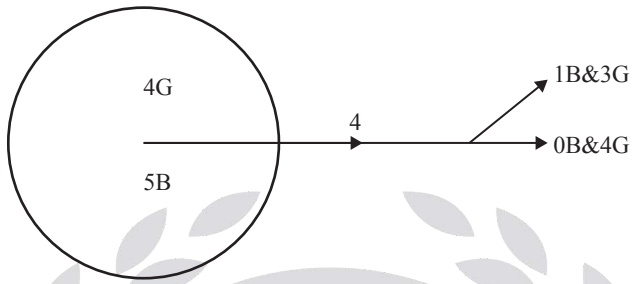
Source: ACE Material Page No 51 – Proprietary information

21. A committee of 4 is to be formed from among 4 girls and 5 boys. What is the probability that the committee will have number of boys less than number of girls?

(a) $\frac{2}{9}$ (b) $\frac{4}{9}$ (c) $\frac{4}{5}$ (d) $\frac{1}{6}$

Ans: (d)

Solution:



The required probability = P(Number of boys < Number of girls)

= P(1 boy and 3 girls or No boys & 4 girls)

$$= \frac{{}^5c_1 . {}^4c_3}{{}^9c_4} + \frac{{}^4c_4}{{}^9c_4}$$

$$= \frac{5.4}{\left(\frac{9\times8\times7\times6}{4\times3\times2\times1}\right)} + \frac{1}{\left(\frac{9.8.7.6}{4.3.2.1}\right)} = \frac{21}{126} = \frac{3}{8} = \frac{1}{6}$$

End of Solution

22. The solution of initial value problem; $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, where $u(x, 0) = 6\, e^{-3x}$ is

(a) $u = 6\, e^{-3x + t}$ (b) $u = 6\, e^{-(2x + 2t)}$ (c) $u = 6\, e^{-(3x + 2t)}$ (d) $u = 6\, e^{-(3x - 2t)}$

Ans: (c)

Solution:

$\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$; $u(x, 0) = 6e^{-3x}$

Let $u = XT$ ------- (1) where X is function of x only and 'T' be a function of 't' only

The given equation becomes

$X^1T = 2XT^1 + XT$

$= X(2T^T + T)$

$\frac{X^1}{X} = \frac{2T^1 + T}{T} = K$

$\frac{X^1}{X} = K \quad \& \quad \frac{(2T^1 + T)}{T} = K$

$\frac{dX}{dx} = KX \quad \& \quad \frac{2T^1}{T} = (K - 1)$

$\frac{dX}{X} = Kdx \quad \& \quad \frac{dT}{dt} = \left(\frac{K-1}{2}\right)T$

$\log X = Kx + C_1 \quad \& \quad \frac{dT}{T} = \left(\frac{K-1}{2}\right)dt$

$\therefore X = e^{Kx + C_1 \ldots\ldots 2} \quad \log T = \left(\frac{K-1}{2}\right)t + c_2$

$\therefore T = e^{\left(\frac{K-1}{2}\right)t + c_2} \text{ ---------- (3)}$

(2) & (3) in (1)

$u(x,t) = e^{Kx + c_1}.e^{\left(\frac{K-1}{2}\right)t + c_2}$

$= Ce^{Kx + \left(\frac{K-1}{2}\right)t}$ where $C = e^{c_1}\, e^{c_2}$

Given, $u(x, 0) = 6e^{-3x}$

$\Rightarrow 6e^{-3x} = Ce^{Kx}$

$\Rightarrow C = 6 \quad \& K = -3$

$\therefore u(x, t) = 6\, e^{-3x - 2t}$

$= 6\, e^{-(3x + 2t)}$

End of Solution

23. Polar form of the Cauchy-Riemann equations is

(a) $\frac{\partial u}{\partial r} = r\frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -r\frac{\partial u}{\partial \theta}$ (b) $\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{\partial \theta}$

(c) $\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -r\frac{\partial u}{\partial \theta}$ (d) $\frac{\partial u}{\partial r} = r\frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{d\theta}$

Ans: (b)

Solution:

In Polar coordinates, cauchy-riemann equations are $\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}$ & $\frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{\partial \theta}$

End of Solution

24. If f(z) has a pole of order n at z = a, then Residue of function f(z) at a is

(a) Res $f(a) = \frac{1}{(n)!}\left\{\frac{d^{n-1}}{dz^{n-1}}((z-a)^{n-1}f(z))\right\}_{z=a}$

(b) Res $f(a) = \frac{1}{(n-1)!}\left\{\frac{d^{n-1}}{dz^{n-1}}((z-a)^{n-1}f(z))\right\}_{z=a}$

(c) Res $f(a) = \frac{1}{(n)!}\left\{\frac{d^{n-1}}{dz^{n-1}}((z-a)^{n}f(z))\right\}_{z=a}$

(d) Res $f(a) = \frac{1}{(n-1)!}\left\{\frac{d^{n-1}}{dz^{n-1}}((z-a)^{n}f(z))\right\}_{z=a}$

Ans: (d)

Solution:

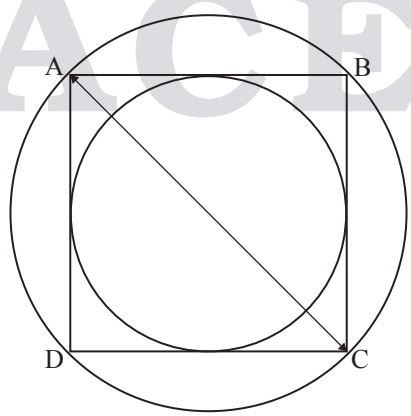
By cauchy's integral formula,

If z = a is poll of order n,

$$\text{Res } f(a) = \frac{1}{(n-1)!}\left\{\frac{d^{n-1}}{dz^{n-1}}(z-a)^{n}f(z)\right\}_{z=a}$$

End of Solution

25. Consider following diagram: AC is a diameter of the large circle and AB = BC.



The ratio of areas of the large circle to the small circle of a square is

(a) 4 : 1 (b) 1 : 4 (c) 2 : 1 (d) 1 : 2

Ans: (c)

Solution:

Let, side of the square = x cm

Then, diagonal of the square = $\sqrt{2}$ x cm

or

Diameter of bigger circle

Area of the bigger circle $= \pi\left[\frac{\sqrt{2}x}{2}\right]^2$

$= \frac{\pi x^2}{2}$ sq. cm

Diameter of smaller circle = side of the square

= x cm

$\therefore$ Area of smaller circle $= \pi\left[\frac{x}{2}\right]^2$ or $\frac{\pi x^2}{4}$ sq.cm

$\therefore$ Required Ratio $= \frac{\pi x^2}{2} : \frac{\pi x^2}{4}$ or 2:1

End of Solution

26. Which term refers to a single person having authority to oversee all aspects of a product's production scheduling, inventory, dislocation and sales?

(a) Project management

(b) Product management

(c) Commercial management

(d) Venture management

Ans: (a)

Solution:

In a project organization, all management functions such as Planning, Scheduling, Procurement and Controlling are to be monitored by a Project Manager.

End of Solution

27. The lowest Eigen value of the 2 × 2 matrix $\begin{bmatrix} 4 & 2 \\ 1 & 3 \end{bmatrix}$ is

(a) 1 (b) 2 (c) 3 (d) 5

Ans: (b)

Solution:

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

The characteristic equation of A is

$|A - \lambda I| = 0$

$\lambda^2 - 7\lambda + 10 = 0$

$(\lambda - 5)(\lambda - 2) = 0$

$\lambda = 5, 2$

$\therefore$ lowest eigen value = 2

End of Solution

28. Consider the following statements:
    1. Mobile cranes are sophisticated machines which are designed for lifting efficiently.
    2. Mobile cranes are a versatile and reliable of lifting on site.

    Which of the above statements is/are correct?

    (a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Solution:

Both 1 and 2 is correct statement 1 → True

Mobile cranes unlike tower cranes are designed to move across the construction site, for lifting the load efficiently.

Statement 2: True

Based on the type of application like terrain, highways, or off shores which make them highly versatile and reliable means of lifting on site.

End of Solution

29. Which of the following statements are correct for portable step-ladders?
    1. Used on working platforms to gain height above the protected edge.
    2. Used in the fully opened position.
    3. Should be of a length that ensures a person's feet are not positioned any higher than the second top rung.

    Select the correct answer using the codes given below:

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

Ans: (c)

Solution:

- Unprotected edge means any side or edge (except at entrances to points of access) of a walking/working surface, eg: floor, roof, ramp or run way where there is no wall or guard rail system atleast 39 inches (or 1m) high.
- Protected edge is where the surface is properly protected using the guard rails, etc.,

Statement 1: True

Based on the above definition portable step ladders are used to gain access above the protected edge.

Statement 1: True

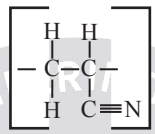
For the safety of workers/users the portable step ladders should always be used in a fully opened and locked conditions.

Statement 3: False

As per OSHA → "DO NOT STAND ON the top 3 rungs of a straight or extension ladder".

End of Solution

30. Consider the following Repeat Unit Structure

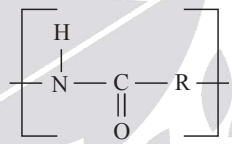
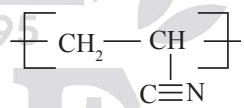
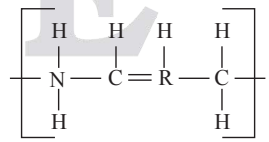
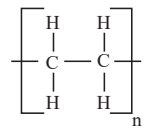


What is the above polymer?

(a) Poly(amide-imide) (b) Polyacrylonitrile (c) Polybutadiene (d) Polyethylene

Ans: (b)

Solution:

Polymer Name	Repeat Unit
1. Poly (amide-imide)	
2. Polyacrylonirile	
3. Polybutadiene	
4. Polyethylene	

End of Solution

31. Which of the following measures is/are correct for using Mobile Equipment Working Platform (MEWP)?
    1. Tyres are properly inflated and air filled.
    2. SWL to be marked in platforms as identification for carrying loads.

    (a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Solution:

→ Mobile Equipment Working Platform (MEWP) is a mechanical device used to provide temporary access for people or equipment to in accessible areas, usually at height.

→ Statement 1: True

Tyres should be properly inflated to provide proper balancing and safety of the workers and equipment on the platform when the MEWP is moving.

→ Statement 2: True

'Safe working load' should be properly marked as warnings for safe usage of MEWP.

End of Solution

32. Ozone layer present in the atmosphere protects life on earth by not permitting harmful radiations present in the sunlight to penetrate through it. Ozone layer is formed by the reaction of

(a) Chlorofluorocarbons (CFCs) on oxygen (O_2)

(b) Chlorine (Cl) on oxygen (O_2)

(c) Solar Ultraviolet rays on oxygen (O_2)

(d) Chlorine nitrate ($ClNO_3$) on oxygen (O_2)

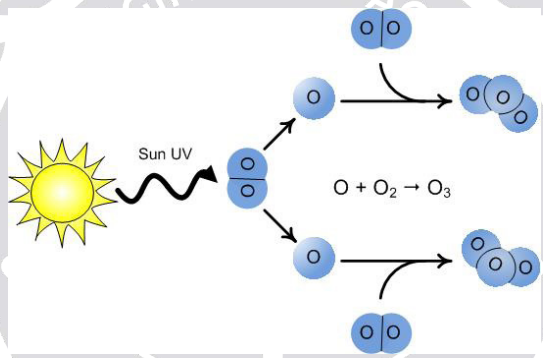
Ans: (c)

Solution:

Ozone in the stratosphere is produced due to the photochemical reaction i.e.. An oxygen molecule (O_2) in the stratosphere is broken into 2 oxygen atoms [0 + 0] by absorbing ultraviolet light energy from the son. The oxygen molecule (O_2) to create an ozone molecule (O_3).

$O_2 + uv \Rightarrow O + O$

$O + O2 \Rightarrow O_3$



End of Solution

33. The insert command is used in '*Auto CAD*' to insert

(a) Objects in the current file

(b) Objects in any file

(c) Blocks in any drawing file

(d) Blocks and wblocks in the current drawing

Ans: (d)

Solution:

The insert command allows you to place a name block (or) wblock into the current drawing

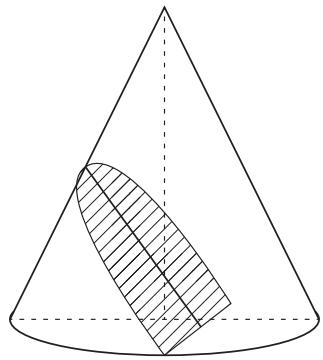
End of Solution

34. A cone resting on its base in horizontal plane (HP) is cut by a plane inclined to the axis and parallel to one of its generators, the sectional view will be

(a) Ellipse (b) Parabola (c) Hyperbola (d) Circle

Ans: (b)

Solution:



Cutting a cone parallel to end generated then the true shape of section is "Parabola".

End of Solution

35. Consider the following components
    1. Knowledge of psychology
    2. Knowledge of the theory of variation
    3. Knowledge of process
    4. Knowledge of the system and the theory of optimization

    Which of the above components comprise the basis of Deming's Systems of Profound Knowledge?

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

Ans: (d)

Solution:

Knowledge of psychology is not part of profound knowledge. It deals with psychology of change.

End of Solution

36. Consider the following statements:
    1. Greenfield Privatization or Incremental Privatization denotes encouragement to private sector in areas hitherto reserved for Public Enterprises.
    2. Cold Privatization refers to measures taken to distance Public Enterprises from the Government.

    Which of the above statements is/are correct?

    (a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Solution: Greenfield privatization or incremental privatization denotes encouragement to private sector in areas hitherto reserved for public sector, not allowing new investment on the part of public sector agencies, preferential treatment given to public sector.

Cold privatization refers to public enterprises made to behave like private enterprises by giving financial autonomy, autonomy in investment decisions, entering into Memorandum of Understanding (MoU) to fix prices, output.

Topic: Industrial Sector; Difficulty level: Moderate; Class discussion

End of Solution

37. Which of the following steps are involved in the product improvement cycle?
    1. Sell it in the market
    2. Determine quality of performance
    3. Design the product based on customer needs
    4. Test it in the laboratory

    Select the correct answer using the codes given below:

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

    Ans: (d)

    Solution:

    Statement 1: True

    Product improvement cycle ultimate goal is to reach the customer (sell it in the market)

    Statement 2: True

    In order to improve the product, the current quality of performance should be assessed.

    Statement 3: True

    Product improvement should focus on the customer needs to build the product that can be used and liked by the customers.

    Statement 4: True

    Product improvement cycle includes testing the product for its goals and specifications.

End of Solution

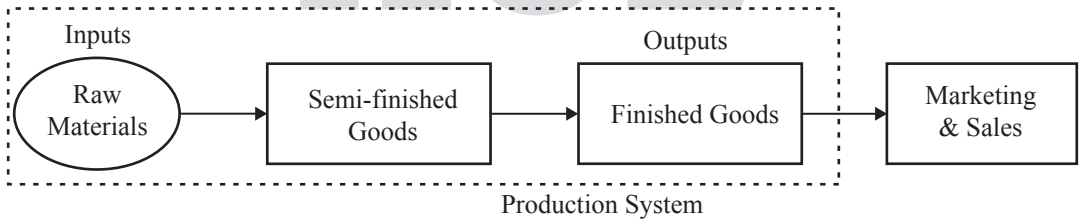
38. Who is responsible for establishing, documenting and maintaining procedures for post-production handling functions such as storage, packaging and delivery?

    (a) Production Manager (b) Marketing Manager

    (c) Vendor (d) Quality Supervisor

    Ans: (b)

    Solution:



Marketing manager role will start after production only. Sales and Distributions are the major activities.

(Source Class notes)

End of Solution

39. A unit produces packing boxes. Out of hourly production of 4000 boxes, 20 were found to be non-conforming. If the inspector randomly chooses a box form an hour's production, the probability of it being non-conforming is

(a) 0.02 (b) 0.10 (c) 0.005 (d) 0.05

Ans: (c)

Solution:

1 hour production is 4000 7units, out of which 20 were defective.

Favourable outcomes = $20_{c_1} = 20$

Total outcomes = $4000c_1 = 4000$

Probability = $\frac{20}{4000} = 0.005$

End of Solution

40. Which of the following are relevant factors regarding quality in service sector?

1. Timeliness of service
2. Customer participation
3. Company personnel motivation
4. Company culture

Select the correct answer using the codes given below.

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

Ans: (c)

Solution:

Timeliness of service is very much relevant to service sector.

Therefore 'd' is wrong.

Apart from it, customer participation personnel motivation and company culture are relevant.

End of Solution

41. Which one of the following tests can be resorted to in order ot check the structural soundness conformance to the specified standards, when all other tests fail?

(a) Destructive (b) Non-destructive (c) Full scale load (d) Masonry

Ans: (c)

Solution: Full scale load method:

This method is used to check the structural adequency and performance of component.

End of Solution

42. Which of the following are the sources of variation in quality control process in construction?

1. Material
2. Operator
3. Inspection activity

Selection the correct answer using the codes given below.

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

Ans: (a)

Solution:

Proportion of raw mater and operator function variations change the output quality.

Inspection activity includes inspector i.e. it varies between lenient and straight.

End of Solution

43. What is the break-even sale for the following products?

	Products		
	A	**B**	**C**
Sales (Units)	5,000	6,000	4,000
Unit selling price (Rs.)	10	15	18
Unit variable price (Rs.)	6	4	13
Fixed cost of the product is (Rs. 20,000)			

(a) Rs. 90,000 (b) Rs. 80,000 (c) Rs. 60,000 (d) 40, 000

Ans: (d)

Solution:

$$\text{Break Even Sales (BES)} = \frac{\text{Fixed cost}}{\text{CM Ratio}}$$

$$\text{Cost Margin (CM) Ratio} = \frac{\sum_{i=1}^{n} q_i (S_i - V_i)}{\sum_{i=1}^{n} q_i S_i}$$

$$= \frac{5000(10-6) + 6000(15-4) + 4000(18-13)}{5000 \times 10 + 6000 \times 15 + 4000 \times 18}$$

$$= \frac{20000 + 66000 + 20000}{50000 + 90000 + 72000}$$

$$= 0.5$$

$$\text{BES} = \frac{20,000}{0.5} = 40,000$$

End of Solution

44. Which of the following approaches are correct regarding total quality?
    1. Opportunity to improve
    2. Adoption requires little change
    3. React to competitive threats

    Select the correct answer using the codes given below:

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

    Ans: (b)

    Solution:

    Opportunity to improve and reactions to competitive threats are correct approaches to TQM.

    Adoption may sometime require big change.

End of Solution

45. Which of the following are constraints to the use of TQM in construction process?
    1. A transient labour force.
    2. The construction process is relatively short in duration.
    3. Hierarchical and vertical organization structure.
    4. The construction process has not focused on the detailed needs of the customer.

    Select the correct answer using the codes given below:

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

    Ans: (a)

    Solution:

    Labour force is transient i.e. temporary construction process may not be short duration not focusing on detailed needs of customer will limit TQM implementation.

    Organisation structure is least relevant for TQM implementation.

End of Solution

46. BOD of a waste water sample is estimated to be 180 mg/*l*. Assuming 4 mg/*l* BOD can be consumed in the BOD bottle, the volume of undiluted sample to be added to a 300 m*l* bottle is nearly

    (a) 6.7 m*l* (b) 5.6 m*l* (c) 4.4 m*l* (d) 3.3 m*l*

    Ans: (a)

    Solution:

    180 = 4 x 3/ sewage sample

    sewage sample = (4 x 300)/180 = 6.7 m*l*

End of Solution

47. Venturi scrubber, a device used to remove particulate matter from the atmosphere, works on the principle of
(a) Settling by gravitational force
(b) Removal by centrifugal force
(c) Removal by electrically charged particles
(d) Removal by atomized water vapour

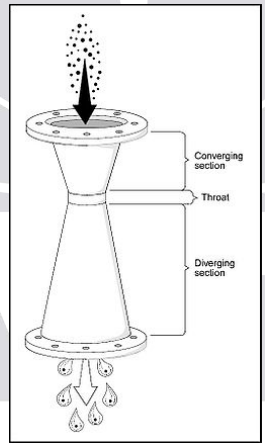
Ans: (d)

Solution:

Envitech's Venturi Scrubber efficiently removes particulate. The inlet can handle gases up to 230ºC (450ºF). Higher inlet temperatures can be accommodated with the addition of a quencher to saturate the gas before entering the Venturi.

This type of technology is a part of the group of air pollution controls collectively referred to as "wet scrubbers." Venturi scrubbers are also known as venturi jet scrubbers, gas-atomizing spray scrubbers, and ejector-venturi scrubbers.

Venturi scrubbers are primarily used to control particulate matter (PM), including PM less than or equal to 10 micrometers (μm) in aerodynamic diameter (PM10), and PM less than or equal to 2.5 μm in aerodynamic diameter (PM2.5). Though capable of some incidental control of volatile organic compounds (VOC), generally venturi scrubbers are limited to control PM and high solubility gases.



End of Solution

48. Environmental Impact Assessment (EIA) is aimed to help
(a) Estimate future needs of the society
(b) Smooth implementation of a project
(c) Cope with rapid increase in population
(d) Resource conservation

Ans: (b)

Solution:

EIA is a tool which helps to evaluate environmental impact of proposed developmental projects or programs for which clearance will be accorded after mitigation strategies are included in the plan. EIA thus proves to be a tool which improves decision making and ensures that the project under construction is environmentally sound and within limits of the capacity of assimilation and regeneration capacities of the ecosystem. Environmental clearance of developmental projects is a mandatory procedure.

- Environmental Impact Assessment (EIA) is an important management tool for ensuring optimal use of natural resources for sustainable development, and was introduced in India initially for River Valley Projects in 1978-79. The scope of the EIA has been enhanced to cover other developmental sectors such as industries, mining schemes, energy, etc.

Source: ACE material . Chapter - 7_ Page no. 190 (Energy & Environment)

End of Solution

49. Which one of the following is a terrestrial type of ecosystem?

(a) Limnetic (b) Estuary (c) Prairie (d) Reefs

Ans: (c)

Solution:

Terrestrial type of Ecosystems → Prairie [grass lands]

Aquatic → Limnetic Estuary Reefs

End of Solution

50. What are the limitations of solar energy?
    1. Collecting solar energy over large areas and converting it to other forms that can be conveniently transported, stored and used in existing equipment is not economical.
    2. Low density of solar energy as compared to coal, oil and gas.
    3. Its major applications are photo thermal conversion, solar water heating, green housing technology and photo voltaic conversion.

    Select the correct answer using the codes given below:

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

    Ans: (b)

    Solution: Statement 1 is right. It can be transported but due to transmission loss it is not economical.
    With current existing equipments it can not be stored at high capacity level. Hence it is not economical.
    Statement 2 is right. Due to seasonal impact power production fluctuations exist. Hence, density is low.
    Statement 3 is not a limitation, Hence it is incorrect.

    Reason: Currently we are using all these applications in India. Its major applications are
    - Photo voltaic conversion,
    - Solar water heating,
    - Photo thermal conversion.
    - Solar power has been increasingly exploited as a sustainable construction technology. In green construction, it is utilized in two ways. One pertains to active solar power and the other is passive solar power. Active solar power is the use of functional solar systems that absorb the sun's radiation to cater for heating and electricity provision. It reduces the need for the use of electricity or gas.

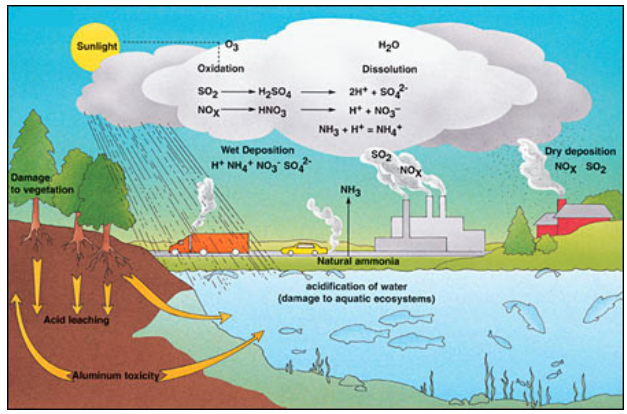
End of Solution

51. Acid rain results when gaseous emissions of Sulfur oxides (SO_x) and nitrogen oxides (NO_x) interact with water vapour and
    (a) Moonlight, and are chemically converted to strong acidic compounds such as sulfuric acid (H_2SO_4) and nitric acid (HNO_3)
    (b) Sunlight, and are chemically converted to strong acidic compounds such as sulfuric acid (H_2SO_4) and nitric acid (HNO_3)
    (c) Moonlight, and are chemically converted to weak acidic compounds such as sulfuric acid (H_2SO_4) and nitric acid (HNO_3)
    (d) Sunlight, and are chemically converted to weak acidic compounds such as sulfuric acid (H_2SO_4) and nitric acid (HNO_3)

    Ans: (b)

    Solution:

    The gaseous emission of sulfur oxides (SO_x) and nitrogen oxides (NO_x) interact with water vapour, in presence of sunlight and are chemically converted to strong acidic compounds such as sulfuric acid (H_2SO_4) and nitric acid HNO_3.



End of Solution

52. The '*Minamata Tragedy*' was caused by the eating of fish growing int the Minamata Bay contaminated with
    (a) Peroxy alynitrate (b) Methyl isocyanate
    (c) Potassium cyanide (d) Methylmercury

Ans: (d)

Solution: Minamata tragedy - methyl mercury

End of Solution

53. What are the advantages of Biomass as a source of energy?
    1. Its storage and transportation is possible
    2. It is ecologically safe and is inoffensive
    3. Can be developed with present man and material abilities
    4. Low capital input required

    Select the correct answer using the codes given below:
    (a) 1, 2, 3 and 4 (b) 1, 2 and 3 only
    (c) 1, 3 and 4 only (d) 2, 3 and 4 only

Ans: (d)

Solution: Carbon Neutral: It doesn't produce carbon. The distinction between using biomass fuel rather than coal or gas is that the carbon that is discharged was already part of nature because of the plant. At the point when coal or gas is utilized it is expelled starting from the earliest stage it has been sequestered for a large number of years. Widely Available: Biomass energy is widely available all over the world. Organic waste in the form of dead leaves, grass and trees, animal carcasses are available in abundance and can be used to produce biomass energy. This in another way is good as the amount of waste that could have gone to landfills can be used as a source of energy. As long as organic matter from plants and animals is going to exist, we are never going to run out of biomass energy.

- Problems associated with management of biomass collection, transportation, processing and storage; problems associated with setting up large size biomass plants,

Source: ACE material . Chapter - 1_ Page no. 31, 32 (Energy & Environment)

54. Consider the following data for a domestic biogas plant:
Number of cows = 5, Retention time = 20 days
Temperature = 30^0C, Dry matter consumed = 2 kg/day
Biogas yield = 0.24 m^3/kg, Efficiency of burner = 60%
Methane proportion = 0.8
Heat of combustion of Methane = 28 MJ/m^3
Density of dry material in fluid = 50 kg/m^3
The power available from the digester will be nearly
(a) 16.2 MJ/day (b) 24.3 MJ/day (c) 32.3 MJ/day (d) 48.6 MJ/day
Ans: (c)
Solution: Dry matter consumed from one cow = 2 kg/day
From 5 cows = 2×5 = 10 kg/day
Gas produced = 10 × 0.24 = 2.4 m^3/day
Thermal energy available = 2.4 × 0.8 × 28 × 0.6
= 32.256 MJ/day
= 32.3 MJ/day

End of Solution

55. The best tool to ensure that there is neither piling up of stocks nor shortage of materials in a project to run it economically is
(a) Economic Order Quantity
(b) ABC Analysis
(c) Inventory Control and Management
(d) Gantt Chart Method
Ans: (c)
Solution:
Inventory control deals with optimum stock levels to minimize total annual costs by controlling inventory. It is also meant for avoiding Overstock and Understock.
Source: Basics of project Management Page No. 59

End of Solution

56. A machine is expected to generate cash saving (after-tax) of Rs. 50,000 per annum over a period of 5 years. Salvage value of machine is 40% of the original cost. If accounting rate of return is 20%, cost of two such machines will be
(a) Rs.78,125 (b) Rs. 1,56,250 (c) Rs. 3,12,500 (d) Rs. 6,25,000
Ans: (c)

Solution:

Initial cost = P

Salvage value = SV

$$\text{Annual depreciation} = \frac{P - SV}{n} = \frac{(P - 0.4P)}{5} = \frac{0.6P}{5}$$

$$\text{Annual accounting rate of return} = \frac{\text{Annual savings} - \text{Annual depreciation}}{\text{Initial cost}}$$

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

$$0.2P = 50000 - \frac{0.6\,P}{5}$$

$$0.2P = \frac{5 \times 50000 - 0.6\,P}{5}$$

$$1.6\,P = 5 \times 50000$$

$$P = 1{,}56{,}250$$

Cost of two machines = $2 \times 156250 = 3{,}12{,}500$ /-

End of Solution

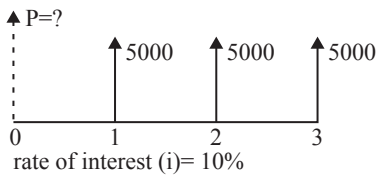
57. It is expected to receive Rs. 5,000 annually for 3 years with each receipt occurring at the end of the year. With a discount rate of 10%, the present value of the annuity will be nearly

(a) Rs. 12,435 (b) Rs. 9,945 (c) Rs. 4,975 (d) Rs. 2,487

Ans: (a)

Solution:

$$P = \frac{5000}{(1+0.1)} + \frac{5000}{(1+0.1)^2} + \frac{5000}{(1+0.1)^3}$$



$= 5000 \times 0.909 + 5000 \times 0.826 + 5000 \times 0.7511$

$= 12431/-$

Source: Basics of Project Management Page No. 18

End of Solution

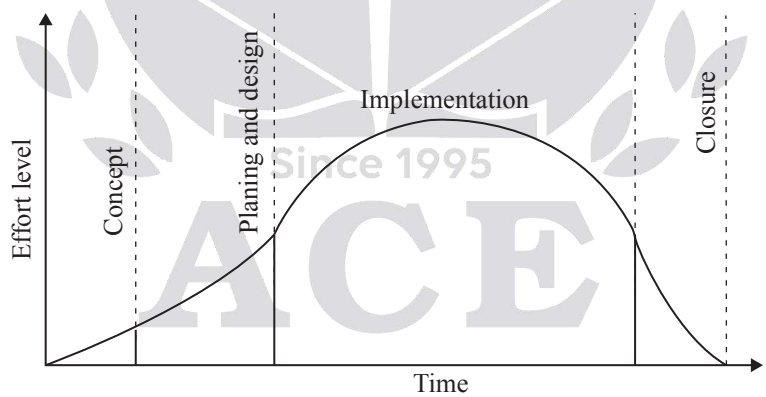
58. In a project life cycle, the maximum percentage of effort is done in

(a) Concept phase (b) Definition phase

(c) Planning and organizing phase (d) Implementation phase

Ans: (d)

Solution:



In a project life cycle, these are 4 stages

1. Concept stage
2. Planning and design
3. Implementation
4. Closeout

Effort is maximum in the implementation stage.

Source: Basics of Project Management, Page No. 4

End of Solution

59. In progress of a project, the percentage of error will be less in
(a) Definitive cost estimate (b) Detailed estimate
(c) Preliminary estimate (d) Study estimate

Ans: (a)

Solution:

Life Cycle Stage	Type of Cost Estimate
Initial (or) Concept stage	Rough order magnitude (or) Indicative cost estimate
Planning and Design stage	Preliminary cost estimate
Implementation and Tendering stage	Detailed cost estimate
Closure stage	Definitive cost estimate

Error level is minimum in definitive cost estimate.

Source: Basics of Project Management Page No. 7

End of Solution

60. In principle, the network should not be made complex. No control system, for that matter, can operate unless it is kept simple. This principle is called
(a) CPM (b) PERT (c) KISS (d) GERT

Ans: (c)

Solution:

If the project scope is very large and complex then K.I.S.S principle is adopted in a project management. The principle is "Keeping the Scope Simple". The meaning of KISS is "Keep It simple and Stupid".

End of Solution

61. Which one of the following is a viable alternative to term-loans and are instruments for raising debt finance by large publicly traded firms?
(a) Shares (b) Debentures (c) Asset loans (d) Gold loans

Ans: (b)

Solution: A debenture is a debt security issued by a company (called the issuer) which offers to pay interest in lieu of money borrowed for a certain period. It represents a loan taken by the issuer who pays an agreed rate of interest during the life time of the instrument and repays the principle normally, unless otherwise agreed, on maturity.

Topic: Financial Markets; Difficulty level: Easy; Class notes

End of Solution

62. Which one of the following makes the design, assembly and operation of complex systems feasible and practical?
(a) System Architecture (b) Modularization (c) Standardization (d) Composition

Ans: (a)

Solution: Product architecture or System Architecture :

It is the arrangement of the physical elements of the product to perform its functions. There are two entirely opposite styles of product architecture, modular and integral.

- Modular architecture helps in developing the design quickly because modules can be developed independently.
- Integral architecture helps in ease of assembling the components. Integral architecture is driven by Design For Manufacture and Assembly (DFMA) which help in quick assembly and operation of the product.

Source: This topic explained in ACE Material Chapter EMBODIMENT DESIGN.

End of Solution

63. Which one of the following schedules shows the specific activities necessary to complete an activity or work package?

(a) Project schedule (b) Master schedule (c) Task schedule (d) Internal schedule

Ans: (c)

Solution:

Work break down structure :

Plan
↓
Program
↓
Project
↓
Sub-project
↓
Task
↓
Work package
↓
Activity

Task schedule deals with the allocation of resources related to work package as well as activity.

End of Solution

64. In a stable ceramic crystal structure, a cation is surrounded by three anions in the form of a planar equilateral triangle. The ratio of the cation-anion radius for the crystal is nearly

(a) 0.16 (b) 0.24 (c) 0.32 (d) 0.41

Ans: (a)

Solution:

A stable ceramic crystal structure with a cation is surrounded by three anions

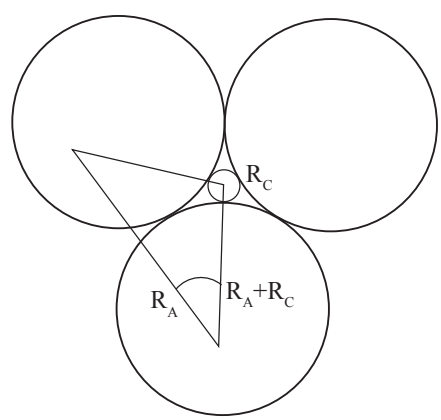
Minimum radius ratio for triangular coordination:

$$\frac{R_A}{R_A + R_C} = \cos 30^\circ$$

$$\frac{R_A + R_C}{R_A} = \frac{1}{\cos 30^\circ}$$

$$1 + \frac{R_C}{R_A} = 1.155$$

$$\frac{R_C}{R_A} = 0.155$$



End of Solution

65. During tensile testing of a material, if cross-sectional area of the specimen is doubled, the load required to produce the same elongation shall be

(a) Double (b) Half (c) Same (d) Four times

Ans: (a)

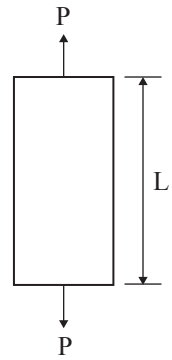
Solution:

The deformation of a material with applied load (P) is

δ = elongation = $\frac{PL}{AE}$

A = cross sectional area

E = Young's modulus



End of Solution

66. When two or more chemically different monomers are polymerized to form a cross link polymer along with some byproduct such as water, the process is known as

(a) Crystallographic polymerization (b) Addition polymerization

(c) Copolymerization (d) Condensation polymerization

Ans: (d)

Solution: Condensation polymerization:

This is formed by joining two or more chemically different monometers to form cross link polymer. In this process by products such as water, generated.

Ex: Polyester (Dacron), Polyamide, Bakelite.

Note: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 10 (Pg.No: 96)

End of Solution

67. The number of atoms per unit length whose centres lie on the direction vector for a specific crystallographic direction is called

(a) Linear density (b) Theoretical density

(c) Atomic density (d) Avogadro number

Ans: (a)

Solution:

Linear density = $\frac{\text{Number of atoms in a direction}}{\text{Length of direction}}$

Note: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 1 (Pg.No: 10)

End of Solution

68. Which of the following features of atoms determine the degree to which the solute atoms dissolve in the solvent atoms?

1. Atomic size factor
2. Crystal structure
3. Electronegativity

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

Ans: (d)

Solution: The Hume-Rothery rules are basic conditions for an element to dissolve in a metal,

1. The **atomic radius** of the solute and solvent atoms must differ by no more than 15% for substitution alloy and solute atoms are much small in interstitial alloy.
2. The solute and solvent should have similar **electronegativities**
3. Same **crystal structure** for "pure" metal

End of Solution

69. A state for ionic compounds wherein there is the exact ratio of cations to anions as predicted by the chemical formula is

(a) Electroneutrality (b) Stoichiometry (c) Equiliometry (d) Frankel defect

Ans: (b)

Solution: Stoichiometry : It is defined as a state for ionic compounds where in there is the exact ratio at cations to anions

Ex: Stoichiometric ratio of Nacl = $\frac{Na^+}{C\ell^-} = \frac{1}{1} = 1$

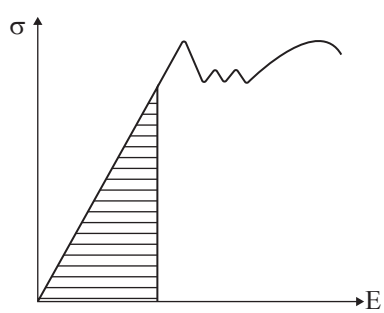
End of Solution

70. The capacity of a material to absorb energy when it is deformed elastically and then, upon unloading, to have this energy recovered is called

(a) Ductility (b) Tensile strength` (c) Elasticity (d) Resilience

Ans: (d)

Solution: Resilience: It is the ability of material that can absorb energy upto the elastic limit. It is calculated by considering area of stress-strain curve upto elastic limit.



Note: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 6 (Pg.No: 64)

71. In which one of the following phase transformations, there are no compositional alterations?

(a) Incongruent transformations (b) Congruent transformations

(c) Non-equilibrium transformations (d) Equilibrium transformations

Ans: (b)

Solution:

Phase transformations are classified according to whether or not there is any change in composition for the phases involved.

(1) **Congruent transformation:** There are no chemical compositional alternation.

(2) **Incongruent transformation:** Atleast one of the phase will change composition.

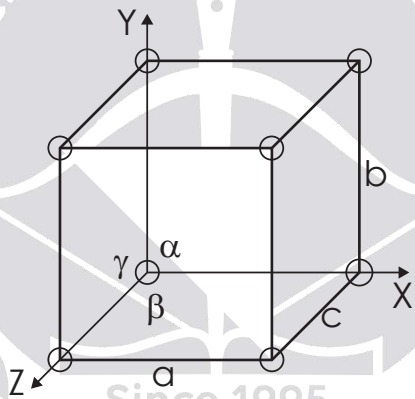
End of Solution

72. In a simple cubic structure, atomic power factor is nearly

(a) 0.9 (b) 0.7 (c) 0.5 (d) 0.3

Ans: (c)

Solution:



Effective number of atoms (n) = $\frac{1}{8} \times 8 = 1$

Relationship between atomic radius (R) and lattice parameter (a)

$a = 2R$

Atomic packing factor = $\frac{\text{total volume of atoms inside unitcell}}{\text{volume of unitcell}}$

$$APF = \frac{n \times \frac{4}{3}\pi R^3}{a^3}$$

$$= \frac{1 \times \frac{4}{3}\pi R^3}{(2R)^3} = 0.52$$

Source: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 1 (Pg.No: 6).

73. Which of the following are the advantages of coding audiovisual objects?
1. It allows interaction with the content
2. It improves reusability and coding the content
3. It allows content-based scalability
(a) 1 and 2 only (b) 1 and 3 only (c) 2 and 3 only (d) 1, 2 and 3

Ans: (d)

Solution:

It is developed in response to the growing need for a coding method that can facilitate access to visual objects in natural and synthetic moving pictures and associate natural or synthetic sound for various applications such as digital storage media Internet.

End of Solution

74. The transmission of real-time streams across networks uses Bandwidth Allocation Mechanism (BAM), which is based on
(a) Stream peak rate (b) Bucket rate (c) Token bucket depth (d) Packet size

Ans: (d)

Solution: Transmission of real time streams across network uses BAM which is based on packets size.

End of Solution

75. The quality of service provided in a computer network is
(a) Presentation layer issue (b) Session layer issue
(c) Network layer issue (d) Data link layer issue

Ans: (c)

Solution: Quality of service is maintained network layer, which uses IP routing.

End of Solution

76. The Pre-echo PE distortions in audio signal represents the
(a) Theoretical limit on compressibility of particular signals
(b) Imaginary components of a signal
(c) Critical band analysis of a signal
(d) Histogram of the signals

Ans: (a)

Solution:

An artifact known as pre-echo distortion can arise in transform coders using perceptual coding rules. Pre-echoes occur when a signal with a sharp attack begins near the end of a transform block immediately following a region of low energy. This situation can arise when coding recording

End of Solution

77. In a computer network, a point-to-point transmission, with one sender and one receiver is called
(a) Unicasting (b) Multicasting (c) Broadcasting (d) Internetworking

Ans: (a)

Solution: In computer network point-to-point transmission with one sender and one receiver is called unicasting.

End of Solution

78. The Protocol (http), the DNS name of the host, and the file name is identified through
(a) Uniform Resource Locator (b) Web Browser
(c) Web Server (d) IP address

Ans: (a)

Solution: Uniform resource locater provides http and DNS and file name.

End of Solution

79. The traditional way to handle forms and other interactive Web pages is a system called
(a) Graphical User Interface (b) Common Gateway Interface
(c) Text Based User Interface (d) Command Line Interface

Ans: (b)

Solution: Common gateway interface offers standard protocol for web-servers to execute programs that execute like CLI running an a server that generates web pages dynamically.

End of Solution

80. Pretty Good Privacy (PGP) which encrypts the data by using a block cipher is used in
(a) FTP security (b) e-mail security (c) Browser security (d) Bluetooth security

Ans: (b)

Solution: PGP (Pretty Good Privacy) is an encryption program that provides cryptographic privacy and authentication for data communication. used in emails & files.

End of Solution

81. The core elements of high-level programming languages are
(a) Keywords, Expressions and Punctuation (b) Functions, Keywords and Operators
(c) Keywords, Operators and Punctuation (d) Functions, Expressions and Operators

Ans: (c)

Solution: Most programming today is done using a high-level language. (For example, Java is a high-level language.) High-level languages enable you to write programs faster, easier, and more reliable. A high-level language defines, constructs that help you organize, structure, and control the logic of your program. Each construct in a high-level language is translated into many machine instructions.

There are many different high-level programming languages, but nearly all define these three core elements:

- Keywords
- Operators
- Punctuation

These elements must be combined according to the syntax rules defined by the language. The syntax rules specify quite precisely what constitutes a valid use of program element. To be compiled, the source code must adhere to these rules.

- Keywords define the building blocks of the language. They are used to specify the high-level constructs supported by the language. For example, keywords are used to control the flow of execution, define various types of data, and provide options and mechanisms that let you manage the execution of a program.
- Operators are used by expressions, with one of the most common being the arithmetic expression. For example, nearly all languages use + to specify addition.
- Punctuation comprises those elements of the language that are used to separate one element from another, group statements, prevent ambiguity, or otherwise clarify the syntax of the language.

(Courtesy: Java Fundamentals by Herbert Schildt, Dale Skrien)

82. The philosophical study of beliefs and knowledge is better known as
(a) Ontology (b) Epistemology (c) Entomology (d) Etymology
Ans: (b)
Solution:
Epistemology is the study or theory of the nature and grounds of knowledge especially with reference to its limits and validity. Topic in Virtues and Wisdom and Public Spirited Virtues in particular
Source: Internet encyclopedia of Philosophy.

End of Solution

83. One branch of ethical philosophy claims that it is possible to know right from wrong or good from bad in a very clear and objective manner, is called
(a) Non-Cognitivism (b) Ethical Pluralism
(c) Cognitivism (d) Utilitarianism
Ans: (c)
Solution: Cognitivism, also referred to as absolutism, claims that moral principles have no justified exceptions and that what is morally true in one situation is true everywhere else.
Source: 1. ACE Academy material Ch 2 Page No 14 & Q No 4, Page No 15
2. Engineering Ethics by M.Govindarajan, S. Natarajan, & VS Senthil Kumar

End of Solution

84. Consider the following statements regarding '*Engineering Ethics*':
1. It is the activity of understanding moral values
2. It resolves the moral issues and justifies moral judgments
3. It would refer to the set of specifically moral problems and issues related to Engineering
Which of the above statements are correct?
(a) 1, 2 and 3 (b) 1 and 2 only (c) 1 and 3 only (d) 2 and 3 only
Ans: (a)
Solution:
Engineering ethics is the study and resolution through proper knowledge the moral issues that arise in the proper conduct of engineering profession.
Source: 1. ACE Academy material Ch 1 Page No 7 & Q No 3 and 5, Page No 9 Q No 5, Page No 10
2. A text book on Professional Ethics by RS Nagarazan

End of Solution

85. A situation where very high prices are charged from customers for a limited period of time is known as
(a) Gouging (b) Zipping (c) Bamboozing (d) Hoodwinking
Ans: (a)

Solution: Price gouging is a term referring to when a seller spikes the prices of goods, services or commodities to a level much higher than is considered reasonable or fair, and is considered exploitative, potentially to an unethical extent. Usually this event occurs after a demand or supply shock: common examples include price increases of basic necessities after hurricanes or other natural disasters. In precise, legal usage, it is the name of a crime that applies in some jurisdictions of the United States during civil emergencies. In less precise usage, it can refer either to prices obtained by practices inconsistent with a competitive free market, or to windfall profits. In the former Soviet Union, it was simply included under the single definition of speculation. *Gouging is situation where very high prices are charged from the customers for a limited period of time.*

(Courtesy: Business Ethics and Corporate governance by Ghosh (TMH)

End of Solution

86. Consider the following steps for an individual regarding preparation for disclosure of unethical behaviour:
    1. Study and document the facts and formulate a plan for an appeal
    2. Take up the matter with higher management
    3. Discuss the matter with immediate supervisor
    4. If the internal appeal does not resolve the conflict, then he should notify the company that he intends to continue with an external review of the problem

    What is the correct sequence of order of the above steps?

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

    Ans: (b)

    Solution: The proper procedure for bringing out unethical practices in an organization is (a) to get to the facts first, (b) exhaust all the internal approach mechanisms and then (c) approach external agencies after due intimation to the management.

    Source: 1. ACE Academy material Ch 1 Page No 7 & Q No 3 and 5, Page No 9 Q No 5, Page No 10
    2. A text book on Professional Ethics by RS Nagarazan

End of Solution

87. Which of the following are the attributes of a profession?
    1. The work requires sophisticated skills, use of judgment and exercise of discretion
    2. Membership in the profession does not require extensive formal education as well as practical training
    3. There are set standards for admission to the profession and conduct for members
    4. Significant public good results from practice of the profession

    Select the correct answer using the codes given below:

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

    Ans: (c)

    Solution: Entry into a Profession should be through a long term education and formal training through a University and hence option 2 is false.

    Source: 1. ACE Academy material Ch 1 Page No 6
    2. A text book on Professional Ethics by RS Nagarazan

88. What are the core qualities of a professional practitioner?
1. Integrity both with themselves and with others
2. Independence-to be free of secondary interests with other parties
3. Competence
4. Discretion-care with communications

Select the correct answer using the codes given below:

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

Ans: (a)

Solution: All the four are the core qualities of a profession

Source: 1. ACE Academy material Ch 1 Page No 1 Q No 1 and 5 Page No 2
2. A text book on Professional Ethics by RS Nagarazan

End of Solution

89. When should whistle blowing be attempted?
1. There must be a clear and great harm that can be avoided
2. The whistleblower must be in a clear position to report on the problem
3. The whistleblower must have a reasonable chance of success in stopping the harmful activity
4. The whistleblower feels that all other lines of action within the context of the organization have been explored and shut off

Select the correct answer using the codes given below:

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

Ans: (b)

Solution: A whistle blower is concerned about the possible harm the public may have to suffer due to unethical practices in an organization. In the hope that the public is saved, whistle blowing is done. However, the whistle blower may not evaluate the outcome and then decide for whistle blowing. Hence 3 is not the option.

End of Solution

90. Which of the following are the salient features of the Patent Act 1970?
1. It codifies inventions which are not patentable
2. It provides for endorsement of patent with the words 'license of right'
3. It provides for revocation of patents in public interest
4. It has provision for validity period also for the patents.

Select the correct answer using the codes given below:

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

Ans: (a)

Solution:

All the four are the salient feature in Patent ACT 1970 of Govt. of India

Source: 1. A text book on Professional Ethics by VS Senthil Kumar et. al. Pg No111

Directions:

*Each of the next **Ten (10)** items consists of two statements, one labelled as the '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 codes given below:*

Codes:

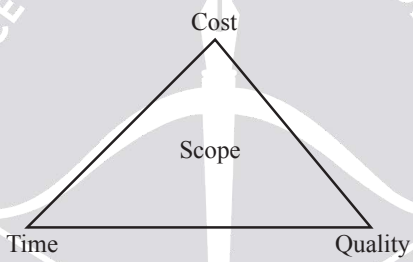
(a) Both Statement (I) and Statement (II) are individually true and Statement (II) is the correct explanation of Statement (I)

(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

91. **Statement (I):** All projects have constraints or limitations that inhibit their ability to reach goals and objectives.
Statement (II): Time and money are universal constraints in projects.
Ans: (b)
Solution:



Project Management constraints
1. Cost 2. Time 3. Quality
Source: Basics of Project Management Page No. 2

End of Solution

92. **Statement (I):** Training should be conducted among the line and low management for ensuring the importance for ensuring the importance of environmental protection plan.
Statement (II): Environmental science is a developing subject and the people implementing environment strategies should remain up to date with the environmental control processes.
Ans: (a)

End of Solution

93. **Statement (I):** Metals having same crystal structure will have greater solubility.
Statement (II): Differences in crystal structure limits the solid solubility.
Ans: (a)

Solution:

Based on Hume-Rothery rule, the metals having same crystal structure will have greater solubility because insolid solution solute atoms occupy certain places in the lattice structure of the solvent

Ex: Cu-Ni Alloy

End of Solution

94. **Statement (I):** The tie line is constructed across the two-phase region at the temperature of the alloy.
Statement (II): The overall alloy composition is located on the tie line.

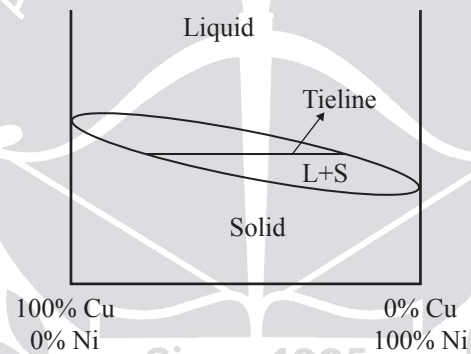
Ans: (a)

Solution:

The lever rule method is used to find the mass fractions of different phases in a two phase region at the temperature of the alloy composition is located.

On tie line, overall alloy composition is located.

Ex: Cu -Ni Phase diagram



End of Solution

95. **Statement (I):** Cross linked polymers may be synthesized in which side-branch chains are connected to the main ones.
Statement (II): Linear polymers are those in which the repeat units are joined together end to end in single chains.

Ans: (d)

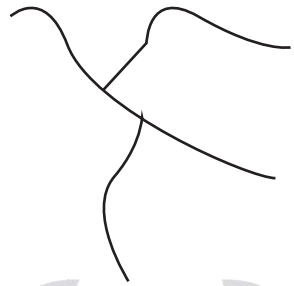
Solution:

Linear Polymer chain:

A Linear polymer is represented by a chain with two ends.

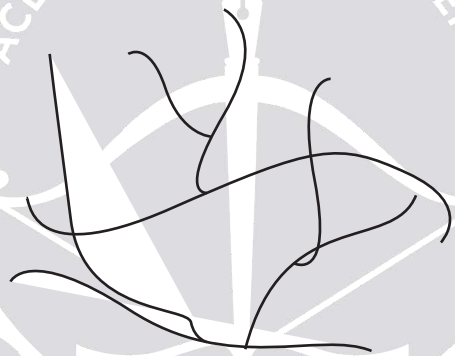
Branched polymers chain

A branched polymers have side chains, or branches, of significant length which are bonded to the main chain at branch points.



Cross linked polymer chain:

Network or cross linked polymers have three dimensional structures in which each chain is connected to all others by a sequence of junction points and other chains. But it does not contain any main chain when compared with branched polymer.



From the question statement I is incorrect and statement II is correct

Source: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 10 (Pg.No: 96).

End of Solution

96. **Statement (I):** Abrasive ceramics are used to wear, grind, or cut away other material, which necessarily is softer.
Statement (II): The prime requisite for abrasive ceramic group of materials is hardness or wear resistance and a high degree of toughness is essential to ensure that the abrasive particles do not easily fracture.

Ans: (a)

Solution:

Ceramics are compounds of both metal and non-metals

The properties of abrasive ceramics are

1. High hardness
2. More wear resistance
3. High toughness
4. High melting point temperature

Applications: The abrasive ceramics are used in bearings, cutting tools, grinding wheel Abrasive particles.
Statement I and Statement II are correct and statement II is explanation for statement I.
Source: Classroom Note Book and ACE study Material of Basics of Material Science and Engineering Chapter No: 10 (Pg.No: 101)

End of Solution

97. **Statement (I):** The prevention costs increase with the introduction of a quality system and may be a significant proportion of the total quality costs.
Statement (II): Costs associated with education and training are not included in prevention costs.
Ans: (c)
Solution: Training is part of prevention costs. Statement II is wrong.

End of Solution

98. **Statement (I):** An emulator is ***not*** a mixture of hardware and software and it cannot be used to test and debug the hardware and software of an external system.
Statement (II): Part of the hardware of an emulator is a multiwire cable which connects the host system to the system being developed.
Ans: (d)
Solution:
Emulator is h/w or s/w that enabler one computer to behave like another system. An emulator typically enables host system to run s/w or use peripheral devices designed for the guest system.

End of Solution

99. **Statement (I):** Agency-loyalty is acting to fulfill one's contractual duties to an employer.
Statement (II): Agency-loyalty is entirely a matter of actions, whatever its motives.
Ans: (a)
Solution:
The question refers to the responsibilities of the employee towards his/her employer and fulfilling all the contractual obligations, irrespective of the outcome or motives of the employer.
Source: 1. A text book on Professional Ethics by VS Senthil Kumar et. al. Pg No 82
2. A text book on Professional Ethics by RS Ngarazan Pg No 71

End of Solution

100. **Statement (I):** An EIA is a study of the probable changes in socio-economic and bio-physical characteristics of the environment that may result from a proposed action.

Statement (II): The purposes of an EIA is to help design projects, which do not disturb the quality of an environment by examining alternatives.

Ans: (b)

Solution: The purpose of Environmental Impact Assessment (EIA) is to identify and evaluate the potential impacts (beneficial and adverse) of development and projects on the environmental system. It is a useful aid for decision making based on understanding of the environment implications including social, cultural and aesthetic concerns which could be integrated with the analysis of the project costs and benefits. This exercise should be undertaken early enough in the planning stage of projects for selection of environmentally compatible sites, process technologies and such other environmental safeguards.

Source: ACE material . Chapter - 7_ Page no. 190 (Energy & Environment)

End of Solution

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Subject wise Reviews

Current Affairs:

From the topic of Social Economic and Industrial Development 11 questions appeared in the examination. The questions seem to be easy to moderate, any student with strong fundamentals can answer 9 out of the 11 questions.

Of the 11 questions 4 questions are easy, 5 questions are moderate and 3 questions are tough.

Basics of Project Managements:

There are 11 questions from basics of project management.

(26, 38, 43, 55, 56, 57, 58, 59, 60, 63, 91)

- Out of 11 questions, 7 questions are easy and basic level. The student can answer easily with in 1 or 2 min.
- 2 questions are moderate and difficult to answer. The student has to spend more than 2 min to answer these questions. These questions are Formula based.
- 2 questions are hard and very difficult to answer with in 2 min. However, some mathematical calculations are required. These questions are formula based as well as concept oriented.
- Mechanical Engineering and Civil Engineering students can answer comfortably compared to EEE & ECE students.

Most of the questions are covered from the basics and couple of questions are numerical based.

General Aptitude:

This Time, Maximum

Covered topics → Mensuration
→ Profit and loss
→ Time and Distance
→ Directions concept

The level of the questions – are Average level. Not difficult for quant.

For menstruation → little bit difficult

The paper can be attempted by an average student.

Design and Safety:

The Design questions are straight foreword. The questions check the basic understanding of the engineer in terms of product design life cycle. These questions can easily be answered by all domains without any difficulty.

There are questions that are related to 'strength of materials' which are easy to answer for mechanical or civil candidates where as it slightly difficult for Electrical or Electronics Engineers.

The questions from safety are an application of the fundamental principles of safety which the candidate should imagine the product's functioning and what safety measures should be used while suing the product. The candidate should attempt the questions with caution they are slightly time consuming.

Ethics and Values in Engineering Profession:

The questions (19, 20, 82, 83, 84, 85, 86, 87, 88, 89, 90, 99) that are tested in Engineering Ethics - ESE_2019 are quite moderate and can be attempted by any student who atleast attended the classes or has fundamentals of engineering ethics. The questions tested are quite general based on the chapters of ACE Engineering Ethics book (Ethics and values in Engineering Profession). The questions appeared seems to be the overall content or gist of the given chapters. For example, the first chapter of the ACE book

highlights about the main theme on Professional Ethics and Human values like what do you mean by a profession or attributes of a profession. From the second chapter (Ethical theories) questions raised are like Congnitivism, Ethical pluralism and utilitarianism. Similarly, general questions which are dealt in the book appeared are

→ Engineering Ethics (definition)
→ Qualities of a professional practitioner
→ Whistle blowing
→ Salient features of the patent act 1970
→ Rights and responsibilities etc.

In my opinion, the question paper is prepared by a philosopher who has thorough knowledge on Ethics and values in Engineering Profession. Students who took the test would come out of the examination hall with a sense of achievement and feeling of satisfaction. Hats off to the test maker.

Material Science:

There are 15 questions in Basics of Material science and Engineering.

- 6 questions are very easy and direct answer questions and there questions are directly from classroom note book and Ace study material. The student can answer early within 1min
- 4 questions are moderate and indirect answer questions but those students, who attended classes can easily attempt questions with in 3 min.
- 3 questions are difficult but student can attempt by attending classes and revisioning of class notes and study material.
- 2 questions are very difficult for an average student.

Drawing:

Drawing questions in ESE-2019 are covered from two topics.

→ 1 questions from curves (conic section)
→ 1 questions from Auto CAD.

Students with basic back ground in Engineering drawing can attempt this paper easily.

Standards and quality practices:

Like in last year one-third of the questions are Generic. A total of 08 questions are asked this year only one questions has come from assertion and reasoning unlike least year (where many questions have come).

Couple of questions are based on student's knack of identifying one statement which is least relevant or least irrelevant. This makes the questions actually easy though it looks too technical.

Compared to the 2 previous papers bias towards Mechanical stream students is less.

Overall 4 – 5 questions can be answered by going through material and class. (3 questions are on direct points discussed in class).

Information and Communication Technologies (ICT):

This year the types of question they asked is mostly from networking concept and network security and basics of computer understanding

ESE / GATE / PSUs - 2020
ADMISSIONS OPEN

CENTER	COURSE	BATCH TYPE	DATE
HYDERABAD - DSNR	GATE + PSUS – 2020	Regular Batches	26th April, 11th, 25th May, 09th, 24th June, 8th July 2019
HYDERABAD - DSNR	ESE + GATE + PSUs - 2020	Regular Batches	21st March, 26th April, 11th, 25th May, 09th, 24th June, 8th July 2019
HYDERABAD - DSNR	GATE + PSUs - 2020	Short Term Batches	29th April, 6th, 11th, 18th May 26th May, 2nd June, 2019
HYDERABAD - DSNR	GATE + PSUs - 2020	Morning/Evening Batch	21st Jan 2019
HYDERABAD - DSNR	ESE – 2019 STAGE-II (MAINS)	Regular Batch	17th Feb 2019
HYDERABAD - Abids	GATE + PSUS – 2020	Regular Batches	26th April, 11th, 25th May, 09th, 24th June, 8th July 2019
HYDERABAD - Abids	GATE + PSUs - 2020	Short Term Batches	29th April, 6th, 11th, 18th May 26th May, 2nd June, 2019
HYDERABAD - Abids	ESE + GATE + PSUs - 2020	Morning Batch	21st Jan 2019
HYDERABAD - Abids	ESE – 2019 STAGE-II (MAINS)	Regular Batch	17th Feb 2019
HYDERABAD - Abids	GATE + PSUs - 2020	Weekend Batch	19th Jan 2019
HYDERABAD - Abids	ESE+GATE + PSUs - 2020	Spark Batches	11th May, 09th June 2019
HYDERABAD - Kukatpally	GATE + PSUs - 2020	Morning/Evening Batch	21st Jan 2019
HYDERABAD - Kukatpally	GATE + PSUS – 2020	Regular Batches	17th May, 1st, 16th June, 1st July 2019
HYDERABAD - Kukatpally	GATE + PSUs - 2020	Short Term Batches	29th April, 6th, 11th, 18th May 26th May, 2nd June, 2019
HYDERABAD - Kothapet	ESE + GATE + PSUS – 2020	Regular Batches	21st March, 26th April, 11th, 25th May, 09th, 24th June, 8th July 2019
HYDERABAD - Kothapet	ESE+GATE + PSUs - 2020	Spark Batches	11th May, 09th June 2019
DELHI	ESE+GATE+PSUs - 2020	Weekend Batches	13th Jan, 2nd Feb 2019
DELHI	ESE+GATE+PSUs - 2020	Regular Evening Batch	18th Feb 2019
DELHI	ESE+GATE+PSUs - 2020	Regular Day Batch	11th May 2019
DELHI	ESE+GATE+PSUs - 2020	Spark Batch	11th May 2019
DELHI	ESE+GATE+PSUs - 2021	Weekend Batch	13th Jan 2019
DELHI	GATE+PSUs - 2020	Short Term Batches	11th, 23rd May 2019
BHOPAL	ESE + GATE+PSUs - 2020 & 21	Evening Batch	09th Jan 2019
BHOPAL	ESE+GATE+PSUs - 2020	Regular Day Batch	01st Week of June 2019
PUNE	GATE+PSUs - 2020	Weekend Batch	19th Jan 2019
PUNE	ESE+GATE+PSUs - 2021	Weekend Batch	26th Jan 2019
BHUBANESWAR	GATE+PSUs - 2020 & 21	Weekend Batch	12th Jan 2019
BHUBANESWAR	GATE+PSUs - 2020	Regular Batch	02nd Week of May 2019

FOR BATCH DETAILS VISIT : www.aceenggacademy.com

ESE / GATE / PSUs - 2020
ADMISSIONS OPEN

CENTER	COURSE	BATCH TYPE	DATE
CHENNAI	GATE+PSUs - 2020 & 21	Weekend Batch	19th Jan 2019
CHENNAI	GATE+PSUs - 2020	Regular Batch	02nd Week of May 2019
BANGALORE	GATE+PSUs - 2020 & 21	Weekend Batch	19th Jan 2019
BANGALORE	GATE+PSUs - 2020	Regular Batch	17th June 2019
BANGALORE	KPSC-AE (CE) – PAPER 1 & PAPER 2	Regular Batch	19th Jan 2019
LUCKNOW	ESE+GATE+PSUs - 2020 & 21	Evening Batch	06th Feb 2019
LUCKNOW	GATE+PSUs - 2020	Regular Batch	Mid - May 2019
PATNA	GATE+PSUs - 2020	Weekend Batch	19th Jan 2019
TIRUPATHI	GATE+PSUs - 2020 & 21	Weekend Batch	19th Jan 2019
KOLKATA	GATE+PSUs - 2020	Weekend Batch	19th Jan 2019
KOLKATA	ESE+GATE+PSUs - 2021	Regular Batch	19th Jan 2019
AHMEDABAD	ESE+GATE+PSUs - 2020&21	Weekend Batch	19th Jan 2019
AHMEDABAD	GATE+PSUs - 2020	Regular Batch	02nd Week of June 2019