

# ESE 2021

## Paper-1

Mechanical Engineering

► Questions & Answer Key

1. Which one of the following rules is NOT used for identifying an out-of-control process?
- A. A process is assumed to be out-of-control if a single point plots outside the control limits.
- B. A process is assumed to be out-of-control if there is a run of six or more consecutive points steadily increasing or decreasing.
- C. A process is assumed to be out-of-control if nine or more consecutive points fall to one side of the centre line.
- D. A process is assumed to be out-of-control if two or more consecutive points fall beyond the  $1\sigma$  limit on the same side of the centre line.

**Ans. D**

2. Which one of the following is NOT a major quality control method?
- A. Inspection                      B. Testing
- C. Loading                          D. Sampling

**Ans. C**

3. Which one of the following is the responsiveness to business issues in commercial performance?
- A. Frequency of over shipments
- B. Quotations
- C. Timely reconciliation of cumulative shipments
- D. Timely supplier response to problems

**Ans. D**

4. Which one of the following is NOT a component of total variability of measured observations?
- A. Variation between operators
- B. Variability due to operators
- C. Variability between parts dimensions
- D. Variation due to interaction between operators and parts

**Ans. D**

5. Which one of the following unique characteristics of the construction process makes TQM difficult to implement?
- A. The construction process is relatively short in duration
- B. A low percentage of the labour at a construction project only work for the construction firm for a short time period
- C. Project owners take a long term view to control projects
- D. Construction projects are multiple, each project being somewhat same

**Ans. B**

6. Rearrange the following steps involved in construction of pareto diagram in the proper order.
- Determine how relative importance is to be judged.
  - Decide on the data categorization system.
  - Rank the categories from most important to least important.
  - Plot a bar graph.
  - Compute the cumulative frequency of the data categories in their chosen order.
- Select the correct answer using the code given below:
- A. 1, 3, 2, 4, 5                      B. 2, 3, 1, 5, 4
- C. 2, 1, 3, 5, 4                      D. 1, 2, 3, 4, 5

**Ans. A**

**Directions:**

Each of the next **Four (04)** 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

**7. Statement (I):** Issue of shares is the most common method especially to raise long-term funds.

**Statement (II):** The equity shareholders are residual owners who have restricted claim on income as dividend.

- 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

**Ans. B**

**8. Statement (I):** The slip mode of deformation is the common mode in only one crystal at ambient and elevated temperature.

**Statement (II):** A slip plane and a slip direction that lies on it together constitute a slip system.

- 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

**Ans. B**

**9. Statement (I):** Major e-Governance projects bear fruit only when application of IT is preceded by process re-engineering.

**Statement (II):** Initiatives which save the citizens' time, money and effort are able to succeed even when back-end computerization is not done.

- 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

**Ans. D**

**10. Statement (I):** Moral pluralists maintain that there are moral truths, but they do not form a body of coherent and consistent truths in the way that one finds in science or mathematics.

**Statement (II):** Moral truth are real, but partial.

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

**Ans. A**

**11.** The surface area of that portion of the surface  $z = \sqrt{4 - x^2}$  that lies above the rectangle R in the xy-plane whose co-ordinates satisfy  $0 \leq x \leq 1$  and  $0 \leq y \leq 4$  is equal to

A.  $4 - \pi$                       B.  $\frac{3}{4}\pi^2$

C.  $\frac{\sqrt{3}}{5}\pi$                       D.  $\frac{4}{3}\pi$

**Ans. D**

**12.** The value of y at  $x = 0.1$  to five places of decimals, by Taylor's series method, given that  $\frac{dy}{dx} = x^2y - 1, y(0) = 1$ , is

A. 0.68281                      B. 0.81122

C. 0.90033                      D. 0.70127

**Ans. C**

**13.** In which one of the following projection types, the object is kept in such a way that its three mutual perpendicular edges make equal angles with the plane of projection and the object stands on one of its corners?

A. Non-Isometric projection

B. Oblique projection

C. Isometric projection D. Point projection

**Ans. C**

**14.** The creative design routes are practiced by adopting following steps:

1. Concentration              2. Illumination
3. Preparation                4. Verification
5. Incubation

Arrange the above steps in correct sequence:

A. 2, 1, 5, 2, 4              B. 3, 5, 2, 1, 4

C. 3, 2, 1, 5, 4              D. 3, 1, 2, 5, 4

**Ans. B**

**15.** Points to be remembered while dimensioning:

1. Dimensions are to be placed on the view which clearly express the relevant features.
2. Once dimension is marked in one view, it should not be repeated in another view.
3. Dimensions are to be drawn from hidden lines.
4. Dimensions should be given from the base line or centre line of a hole.

Which of the above statements are correct?

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. B**

**16.** The design of highway interchanges involves the application of the geometry of

- A. Circle arcs                      B. Semi-ellipse
- C. Hyperbola                      D. Semi-circle

**Ans. C**

**17.** On a multi view drawing a visible or invisible line represents the following:

1. Intersection of two surfaces
2. Edge view of a surface
3. Limiting elements of a surface

Which of the above points are correct?

A. 1 and 2 only              B. 2 and 3 only

C. 1 and 3 only              D. 1, 2 and 3

**Ans. D**

- 18.** On a view showing assembled parts, section lines on adjacent pieces are drawn in
- Same directions usually at an angle of  $90^\circ$
  - Opposite directions usually at an angle of  $45^\circ$
  - Opposite directions usually at an angle of  $30^\circ$
  - Same directions usually at an angle of  $60^\circ$

**Ans. B**

- 19.** Oblique drawing has the following advantage over isometric drawing:
- Distortion can be increased by foreshortening measurements along the receding axis
  - A greater choice is permitted in orthographic top view
  - Circular or irregular outlines on the front face show in their true shape
  - Oblique drawing is often less flexible

**Ans. C**

- 20.** Most of Deming's deadly diseases involve
- Immobility of management
  - A long term orientation
  - A lack of understanding of variation
  - High degree of constancy of purpose

**Ans. C**

- 21.** suppose that a book of 600 pages contains 40 printing mistakes. Assume that these errors are randomly distributed throughout the book and  $x$ , the number of errors per pages has a Poisson distribution. What is the probability that 10 pages selected at random will be free of errors?
- $\frac{1}{3}e^{-1}$
  - $2e^{-\frac{1}{3}}$
  - $e^{-\frac{2}{3}}$
  - $\frac{1}{3}e^{-2}$

**Ans. C**

- 22.** The highest Eigen value of the  $2 \times 2$  matrix  $\begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$  is
- 1
  - 5
  - 5
  - 1

**Ans. C**

- 23.** If  $\Delta = \begin{vmatrix} p & p^2(p^3 - 1) \\ q & q^2(q^3 - 1) \\ r & r^2(r^3 - 1) \end{vmatrix} = 0$ , in which  $p, q, r$  are different. The value of  $pqr$  is
- 3
  - 1
  - 2.5
  - 3.5

**Ans. B**

- 24.** If  $A = \begin{bmatrix} -1 & 2 & 3 & -2 \\ 2 & -5 & 1 & 2 \\ 3 & -8 & 5 & 2 \\ 5 & -12 & -1 & 6 \end{bmatrix}$ , then the ran of the matrix A is
- 2
  - 5
  - 4
  - 3

**Ans. A**

- 25.** If  $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & 2 & 3 \end{bmatrix}$ , then which one of the following is correct?
- $A^3 - 3A^2 - 4A + 11I = 0$
  - $A^3 - 4A^2 - 3A + 11I = 0$
  - $A^3 - 4A^2 - 3A + 11I = 0$
  - $A^3 - 3A^2 + 4A + 11I = 0$

**Ans. B**

- 26.** The Maclaurin's series expansion of  $e^{\sin x}$  is
- $1 + x - \frac{x^2}{2} + \frac{x^4}{12} - \dots$
  - $1 - x + \frac{x^2}{2} - \frac{x^4}{8} + \dots$
  - $1 + x + \frac{x^2}{2} - \frac{x^4}{8} + \dots$
  - $1 + x + \frac{x^2}{2} - \frac{x^4}{12} + \dots$

**Ans. C**

- 27.** The real root of  $x^3 + x^2 + 3x + 4 = 0$  correct to four decimal places, obtained using Newton Raphson method is
- 1.3334
  - 1.3221
  - 1.2229
  - 1.2929

**Ans. C**

- 28.** The value of  $\int_0^6 \frac{dx}{1+x^2}$  by Simpson's 1/3 rule is  
 A. 1.3111                      B. 1.3941  
 C. 1.3735                      D. 1.3663

**Ans.** D

- 29.** The value of  $\sum_{1}^n \frac{1}{(x+3)(x+4)}$  is

- A.  $\frac{n}{n+2}$                       B.  $\frac{2n}{n+1}$   
 C.  $\frac{n}{4(n+4)}$                       D.  $\frac{n}{2(n+2)}$

**Ans.** C

- 30.** The surface which intersects the surfaces of the system  $z(x+y) = c(3z+1)$  orthogonally and which passes through the circle  $x^2 + y^2 = 1, z = 1$ , is given by  
 A.  $x^2 + y^2 = 2z^3 + z^2 - 2$   
 B.  $x^2 - y^2 = z^3 + z + 1$   
 C.  $x^2 - y^2 = z^2 + 4$   
 D.  $x^2 + y^2 = z^3 + z^2 + 4$

**Ans.** A

- 31.** In how many years will a sum of ₹ 800 at 10% per annum compounded semi-annually become ₹ 926.10?  
 A.  $1\frac{1}{3}$  years                      B.  $1\frac{1}{2}$  years  
 C.  $2\frac{1}{3}$  years                      D.  $2\frac{1}{2}$  years

**Ans.** B

- 32.** The diagonal of a rectangle is  $\sqrt{41}$  cm and its area is 20 sq.cm. The perimeter of the rectangle is  
 A. 9 cm                      B. 18 cm  
 C. 20 cm                      D. 41 cm

**Ans.** B

- 33.** Four persons are chosen at random from a group of 3 men, 2 women and 4 children. The chance that exactly 2 of them are children, is  
 A.  $\frac{2}{9}$                       B.  $\frac{4}{5}$   
 C.  $\frac{7}{12}$                       D.  $\frac{10}{21}$

**Ans.** D

- 34.** A man walks 1 km to East and then he turns to South and walks 5 km. Again, he turns to East and walks 2 km. After, he turns to North and walks 9 km. Now, how far he is from his station point?  
 A. 3 km                      B. 4 km  
 C. 5 km                      D. 7 km

**Ans.** C

- 35.** The population of a village is 5500. If the number of males increases by 11% and the number of females increases by 20% then the population becomes 6330. The population of female in the village is  
 A. 2000                      B. 2500  
 C. 3000                      D. 3500

**Ans.** B

- 36.** A, B, C, D and E are five different integers. When written in the ascending order of values, the difference between any two adjacent integers is 4. D is the greatest and A is the least. B is greater than E but less than C. The sum of the integers is equal to E. What is the positive difference between the lowest and the highest integers?  
 A. 8                      B. 6  
 C. 16                      D. 18

**Ans.** C

- 37.** Mary introduces Jack as the son of the only daughter of my father's wife. How is Jack related to Mary?  
 A. Brother                      B. Son  
 C. Husband                      D. Father

**Ans.** B

- 38.** The value of  $\int_0^1 \int_0^x (x^2 + y^2) dA$ , where dA indicates small area in xy-plane, is  
 A.  $\frac{1}{2}$  sq. units                      B.  $\frac{1}{3}$  sq. units  
 C.  $-\frac{1}{2}$  sq. units                      D.  $-\frac{1}{3}$  sq. units

**Ans.** B

39. If  $x = uv, y = \frac{u+v}{u-v}$ , then  $\frac{\partial(u,v)}{\partial(x,y)}$  is is
- A.  $\frac{(u-v)^2}{4uv}$                       B.  $\frac{(u+v)^2}{4uv}$   
 C.  $\frac{(u-v)}{4uv}$                         D.  $\frac{(u+v)}{4uv}$

**Ans. A**

40. If  $u = x^3 + y^3$  where  
 $x = a \cos t, y = b \sin t$ , then  $\frac{du}{dt} =$
- A.  $-3a^3 \cos^2 t \sin t + 3b^3 \sin^2 t \cos t$   
 B.  $3a^3 \sin^2 t \cos t + 3b^3 \cos^2 t \sin t$   
 C.  $3b \sin^2 t \cos t + 3a^3 \sin^2 t \cos t$   
 D.  $-3a^3 \sin t + 3b^3 \cos^2 t \sin t$

**Ans. A**

41. Who received the prestigious Abel Prize for the year 2020?
- A. Eric Adelberger and Blayne Heckel  
 B. Hillel Furstenberg and Gregory Margulis  
 C. Yvonne Farrell and Shelley McNamara  
 D. Nina Holden and Lisa Piccirillo

**Ans. B**

42. Select the incorrect pair of the 2020 Nobel Prize Winners with their respective areas of contribution:
- (a) Louise Gluck – Literature  
 (b) Andrea Ghez – Physics  
 (c) Jennifer A. Doudna – Chemistry  
 (d) Harvey J. Alter – Economic Sciences

**Ans. D**

43. What is the angle between the hour hand and minute hand of a clock at 3 : 30?
- A.  $105^\circ$                               B.  $180^\circ$   
 C.  $75^\circ$                                 D.  $90^\circ$

**Ans. C**

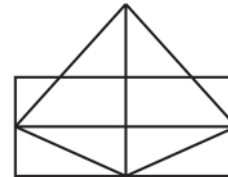
44. Sum of the series  $2^2 + 4^2 + 6^2 + \dots + 20^2$  is
- A. 1040                                B. 1540  
 C. 2540                                D. 3080

**Ans. B**

45. If  $A \times B$  means  $(A^2 + B^2)$ , then the value of  $5 \times (4 \times 3)$
- A. 60                                      B. 300  
 C. 710                                    D. 710

**Ans. C**

46. The number of triangles in the given is



- A. 11                                      B. 13  
 C. 15                                      D. 17

**Ans. A**

47. Statement 1: A has more coins than B.  
 Statement 2: B has fewer coins than C.  
 Statement 3: C has fewer coins than A.  
 If the statement 1 is true and statement 2 is false, then the statement 3 is
- A. True                                    B. False  
 C. Uncertain                            D. Insufficient data

**Ans. A**

48. If  $\frac{x+1}{x-1} = \frac{a}{b}$  and  $\frac{1-y}{1+y} = \frac{b}{a}$ , then the value of  $\frac{x-y}{1+xy}$  is
- A.  $\frac{2ab}{a^2-b^2}$                               B.  $\frac{a^2-b^2}{2ab}$   
 C.  $\frac{a^2+b^2}{2ab}$                                 D.  $\frac{a^2-b^2}{ab}$

**Ans. A**

49. If  $(2x + 3y):(3x + 5y) = 18:29$ , then the value of  $x:y$  is
- A. 4:1                                      B. 4:5  
 C. 3:4                                      D. 3:1

**Ans. C**

**50.** A is twice as good a workman as *B* and together, they finish a piece of work in 18 days.

In how many days will *A* alone finish the work?

- A. 28 days                      B. 30 days  
C. 27 days                      D. 29 days

**Ans.** C

**51.** With a view to encourage and promote Indian artisans and their handicraft, Hunar Haat offers an effective platform. Where was the 22<sup>nd</sup> Hunar Haat held?

- A. Jaipur                      B. Ferozpur  
C. Rampur                      D. Bharatpur

**Ans.** \*

**52.** Which one of the following is not correct pair of Author-Book published in the year 2020?

- A. Arundhati Roy : Azadi  
B. Jairam Ramesh : A Chequered Brilliance  
C. Zadie Smith : Intimations  
D. Diane Cook : One Arranged Murder

**Ans.** D

**53.** Which one of the following statements is not correct regarding the national education policy 2020 in india?

- A. It proposes sweeping changes in the education system from pre-primary to PhD and skill development  
B. It states that universities from among top 100 in the world will be able to set up campuses in india  
C. It expects that india will achieve 60% GER by 2030  
D. It suggests NAAC to be merged with UGC and AICTE

**Ans.** C

**54.** According to the national institutional ranking framework 2020, which institute was on the top in overall ranking?

- A. Indian institute of technology Madras  
B. Indian institute of science, Bangalore  
C. Indian institute of technology, Delhi  
D. Indian institute of technology, Bombay

**Ans.** A

**55.** Consider the following statements about ingenuity:

1. It is man's decades-long quest to fly a helicopter on Mars.
2. It is 0-6 meters tall and weight less than 1.8 kg.
3. It aims to look for habitability.

Which of the above statements is/are correct?

- A. 3 only                      B. 1, 2 and 3  
C. 2 only                      D. 2 only

**Ans.** C

**56.** Name the NASA astronaut who after setting the record of 328-day stay in the international space station (ISS), returned through earth's atmosphere and landed on the Kazakhstani desert on 6<sup>th</sup> feb 2020

- A. Josh Cassada              B. Jeanette Epps  
C. Christina Koch            D. Peggy Whitson

**Ans.** C

**57.** The thirteenth meeting of the conference of the parties to the convention on the conservation of migratory species of wild animals (CMS COP 13) in 2020 was held in

- A. Brazil                      B. India  
C. Indonesia                D. Canada

**Ans.** B



**58.** Consider the following statements with respect to the schemes initiated by the government of india in 2020.

1. NISHTHA is a teachers training program
2. SVANidhi is scheme to facilitate artisans to access affordable working capital loan.
3. SATYABHAMA is a scheme to promote research and development in science and technology.
4. Manodarpan is a scheme to promote tourism in rural parts of india.

Which of the above statements is/are correct?

- A. 1 and 3 only      B. 2 and 4 only  
C. 3 and 4 only      D. 2 only

**Ans.** A

**59.** Which iconic figure set a Guinness World Record in 2020 for receiving 1 million followers for debut on instagram in just 4 hours and 44 minutes?

- A. Bong Joon-ho  
B. Amy Coney Barrett  
C. David Attenborough  
D. Sauna Marin

**Ans.** C

**60.** Which one of the following statements is NOT correct about the Atal Tunnel?

- A. It is the highest altitude tunnel in the world  
B. It was inaugurated on 03 October 2020 in Rohtang  
C. It connects Manali to Lahaul-Spiti valley  
D. It is capable of handling 5000 cars and 2500 trucks per day with maximum speed of 80 kmph

**Ans.** \*

**61.** Match the following:

I	II
A. Act Utilitarian Theory	1. John Locke
B. Rule Utilitarian Theory	2. Immanuel Kant
C. Duty Ethics Theory	3. Richard Brandt
D. The Rights Theory	4. J.S. Mill

Select the correct matching using the code given below:

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
A.	4	3	1	2
B.	4	3	2	1
C.	1	2	3	4
D.	1	2	4	3

**Ans.** \*

**62.** Which philosopher suggested Wisdom, Courage, Temperance and Justice as four 'cardinal virtues'?

- A. Aristotle      B. Aquinas  
C. Socrates      D. Plato

**Ans.** D

**63.** 'Groupthink', a noteworthy feature of the organizational settings within which engineers work and deliberate in groups, has been suggested by

- A. Abraham Maslow      B. Irving Janis  
C. B. F. Skinner      D. Christopher Meyers

**Ans.** B

**64.** Select inappropriate statement about integrity

- A. It involves the discovery and communication of the truth  
B. It leads to a concern for the whole situation in decision-making, including an awareness of

the professional's own attitudes, standards and value systems

C. It is simply truthfulness or avoidance of lying

D. It ensures that the professional does not accept 'moral distance'

**Ans. D**

**65.** Whistleblowing in an organizational set up affects:

1. Peer professional relationships
2. Relationships with management
3. Family relations

Which of the above statements is/ are correct?

- A. 1 and 2 only                      B. 2 only  
C. 1, 2 and 3                        D. 1 only

**Ans. C**

**66.** Carol Gilligan is associated with

- A. the natural justice
- B. the responsibility
- C. the principle of loyalty
- D. the ethics of care

**Ans. D**

**67.** Hooch & Bootlegging refer to

- A. the prohibition law on unethical practices related to liquor
- B. laws against giving money to beggars as a generous act
- C. food adulteration rules
- D. laws on checking the illegal business of duplicate goods

**Ans. A**

**68.** The Ministry of Sports and Youth Affairs has recently approved the inclusion of four indigenous games to be part of Khelo India

Youth Games 2021. Which one of the following is NOT included ?

- A. Thang-Ta B. Lagori  
C. Kalaripayattu D. Gatka

**Ans. B**

**69.** Which one of the following is the latest in series being organized as the largest virtual gathering to create dialogues, and accelerate innovation in agriculture?

- A. Agri-India Hackathon 2020
- B. National Agriculture Higher Education Project
- C. ENSURE
- D. National Mission for Sustainable Development

**Ans. A**

**70.** Match the following:

**List -I**

- A. Utkarsh Bangla
- B. Placement Linked Skill Training Programme
- C. SURYA Scheme
- D. Employment Linked Skill Training Programme

**List-II**

1. West Bengal Scheme
2. Rajasthan
3. Haryana
4. Assam

Select the correct matching using the code given below:

**A B C D**

- A. 2 3 4 1
- B. 2 3 1 4
- C. 1 4 3 2
- D. 1 4 2 3

**Ans. C**

- 71.** Which one of the following standards is used in vehicular communication system ?
- A. IEEE 802.11a      B. IEEE 802.11p  
C. IEEE 802.11g      D. IEEE 802.11h

**Ans.** B

- 72.** Which of the following network metrics are used to evaluate the performance of a network?
- A. Throughput and Delay  
B. Reliability and Security  
C. Topology and Type of connection  
D. Portability and Security

**Ans.** C

- 73.** Which of the following things are defined by uniform resource locator for specifying the information on the internet?
- A. protocol, host computer, throughput and delay  
B. host computer, destination computer and delay  
C. throughput, delay, port and path  
D. protocol, host computer, port and path

**Ans.** D

- 74.** Which one of the following documents are created and handled by the Common Gateway Interface (CGI) technology?
- A. Dynamic documents  
B. Static documents  
C. Tampered documents  
D. Linked documents

**Ans.** A

- 75.** Which one of the following learnings uses web technology to conduct conventional classes with distant learners?
- A. Learner-led e-learning  
B. Instructor-led e-learning  
C. Telementoring and e-coaching  
D. Facilitated e-learning

**Ans.** D

- 76.** Which one of the following frame- works is developed to assess the value of the increasing investments made on e-governance projects in terms of service orientation, technology architecture, replicability and sustainability in various states across the country?
- A. Technology Group@IMRB  
B. e-Governance Assessment Framework  
C. Sustainable Access in Rural India  
D. e-Governance Action Plan

**Ans.** D

- 77.** Which one of the following services does NOT come under category of Cloud computing?
- A. IaaS (Infrastructure as a Service)  
B. SaaS (Software as a Service)  
C. PaaS (Platform as a Service)  
D. BDaaS (Big data as a Service)

**Ans.** D

- 78.** What is the key size of Data Encryption Standard algorithm in cryptography?
- A. 56 bit      B. 62 bit  
C. 168 bit      D. 128 bit

**Ans.** A

- 79.** Which one of the following statements is NOT correct about the codes of conduct?
- A. These cover general guiding principles  
B. Their purpose is to regulate the conduct of members on various transactions  
C. These are the broader sets of principles that are designed to inform specific laws or government actions  
D. These translate the values into specific behavioral standards, keeping in mind the possible reflection on the stakeholders' interest

**Ans.** D

- 80.** The famous statement "The weak, can never forgive. Forgiveness is the attribute of the strong" is given by
- A. Swami Vivekananda
  - B. Mahatma Gandhi
  - C. Martin Luther
  - D. Sri Aurobindo

**Ans. B**

- 81.** Phillip Kotler argues that the 4 Ps which represent the seller's thinking more than buyer's thinking can be translated into the 4 C. Match the following:

4 Ps of Marketing Planning

4 Cs of Marketing Planning

- |              |                           |
|--------------|---------------------------|
| A. Product   | 1. Customer communication |
| B. Price     | 2. Customer value         |
| C. Place     | 3. Customer costs         |
| D. Promotion | 4. Customer convenience   |

Select the correct matching using the code given below:

- |    | A | B | C | D |
|----|---|---|---|---|
| A. | 2 | 3 | 4 | 1 |
| B. | 2 | 3 | 1 | 4 |
| C. | 1 | 4 | 3 | 2 |
| D. | 1 | 4 | 2 | 3 |

**Ans. A**

- 82.** The Boston Consulting Group matrix classifies business in four categories: as "STAR", "QUESTION MARK", "CASH COWS". Which one of the following is the fourth one?
- A. CATS
  - B. HORSES
  - C. DOGS
  - D. HENS

**Ans. C**

- 83.** Under which one of the following circumstances is the project accepted as worthwhile, keeping the principal non-discounting criteria?

- A. The payback period (PBP) > target period
- B. The payback period (PBP) < target period
- C. The payback period (PBP) = target period
- D. The payback period (PBP) = 0

**Ans. B**

- 84.** The purpose of oil in a transformer is to
- A. protect the transformer from rusting
  - B. avoid wear and tear of the transformer
  - C. transfer heat from winding and core to the cooling surfaces of the transformer
  - D. avoid noise in a transformer

**Ans. C**

- 85.** For a semiconductor to be called as p-type semiconductor, which one of the following element impurities are added to a pure semiconductor?
- A. Phosphorus
  - B. Arsenic
  - C. Antimony
  - D. Boron

**Ans. D**

- 86.** Impure semiconductor
- A. has more conductivity in contrast to pure semiconductor
  - B. has less conductivity in contrast to pure semiconductor
  - C. has electrons and holes in equal number
  - D. has a fermi level which is in the centre of conduction and valence bands

**Ans. A**

- 87.** Which one of the following is the disadvantage of ion-implantation over diffusion doping?
- A. It is a low temperature process
  - B. Point imperfections are not produced
  - C. Shallow doping is possible
  - D. Gettering is possible

**Ans.**

**88.** Which one of the following is correct in  $n$ - $p$ - $n$  transistor?

- A. Collector and emitter terminals can be exchanged
- B. Collector is heavily doped, base width is small and emitter area is large
- C. Emitter, base and collector regions are equally doped
- D. Emitter is heavily doped, base width is small and collector area is large

**Ans.** D

**89.** Which one of the following factors does NOT characterize the formation of non-crystalline structure?

- A. Presence of primary bonds in the directions
- B. Non-formation of three-dimensional primary bond
- C. Weak secondary bond
- D. Open network of the atomic packing

**Ans.** A

**90.** Which one of the following protocols is used to address the true routing decisions problems?

- A. Exterior Gateway Protocol
- B. Border Gateway Protocol
- C. Open Shortest Path First Protocol
- D. Interior Gateway Routing Protocol

**Ans.** C

**91.** Match the following:

I	II
A. Thompson	1. The concept of converting mechanical work in heat
B. James P. Joule	2. The theory of relativity
C. Max Planck	3. The energy characteristics of light
D. Albert Einstein	4. The energy equivalence between heat, work and electric power

Select the correct matching using the code given below:

	A	B	C	D
A.	3	4	1	2
B.	1	4	3	2
C.	3	2	1	4
D.	1	2	3	4

**Ans.** B

**92.** According to UNEP, which of the following is/are the major component/s of air pollution?

- 1. SO<sub>2</sub>
- 2. O<sub>3</sub>
- 3. CO
- 4. NO<sub>2</sub>

Select the correct answer using the code given below:

- A. 2 and 3 only
- B. 2 only
- C. 2,3 and 4 only
- D. 1,2,3 and 4

**Ans.** D

**93.** Which one of the following is a 'soft coal' ?

- A. anthracite
- B. bituminous
- C. lignite
- D. magnetite

**Ans.** B

**94.** Which one of the following is NOT correctly matched pair regarding the regional biodiversity?

- A. Point : The number of species richness that can be found at a single point in a given space
- B. Alpha : The number of species richness found in a small heterogeneous area
- C. Beta : The rate of change in richness species composition across different habitats
- D. Gamma : The rate of change richness across large landscape gradients

**Ans.** B

**95.** Energy services for sustainable development are directly linked to

1. Poverty
2. Lifestyles
3. Women
4. Deforestation

Select the correct answer using the code given below:

- A. 1,2 and 3 only      B 1,2 and 4 only  
 C. 2,3 and 4 only      D. 1 and 3 only

**Ans. A**

**96.** Match the following:

**List-I**

- A. Oligotrophic lakes
- B. Dystrophic lakes
- C. Meromictic lakes
- D. Impoundments

**List-II**

1. created due to construction of dams
2. low pH and high humic lakes acid content
3. low nutrient concentration
4. rich in salts and permanently stratified

Select the correct matching using the code given below:

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
A.	4	1	3	2
B.	4	1	2	3
C.	3	2	1	4
D.	3	2	4	1

**Ans. D**

**97.** Which one of the following is NOT included in the 27 principles issued at the Rio-92 UN Conference on the Environment and Development?

- A. The right to development that meets the needs of present and future generations
- B. Right to safety from natural disasters
- C. Protection to the environment in times of armed conflict
- D. Youth mobilization for a global partnership

**Ans. B**

**98.** What are the objectives and functions of state financial corporations?

1. The main function is to provide non-term loans for the acquisition of land, building, plant, machinery and other movable assets.
2. To finance expansion, modernization and upgradation of technology in the existing units.
3. To assist for the promotion of industry by the rural and urban artisans.
4. Providing seed capital assistance under the scheme of Industrial Development Bank of India.

Select the correct answer using the code given below :

- A. 1,2 and 3 only      B. 2,3 and 4 only  
 C. 1,2 and 4 only      D. 1,3 and 4 only

**Ans. C**

**99.** From the following, which facilities are provided for units in the export processing zone?

1. Developed plots/ready-buildings to suit project requirements.
2. Second hand capital goods allowed to be exported.
3. Foreign equity participation up to 100% permissible.
4. Assured power supply, preferential power connection.

Select the correct answer using the code given below :

- |                   |                   |
|-------------------|-------------------|
| A. 1,2 and 4 only | B. 1,2 and 3 only |
| C. 1,3 and 4 only | D. 2,3 and 4 only |

**Ans. B**

- 100.** Which one of the following is NOT the purpose of the organization breakdown structure?
- A. To provide a framework to summarize organization unit work performance
  - B. Do not tie the organizational unit to cost control accounts
  - C. Identify organization units responsible for work packages
  - D. How the firm has organized to discharge work responsibility

**Ans. B**

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