Deerwalk Aptitude Test (DAT)

Instruction
All questions are compulsory.

There are four major sections in this paper - English, Mathematics, Science and IQ.
The marks wise distribution of each of the section is as follows:

Section	Subject	Marks	Time [Suggested]
A	English	20	45 Minutes
B	Science (Physics)	25	45 Minutes
C	Mathematics	25	45 Minutes
D	IQ	10	15 Minutes

You are advised to spend the suggested time.
Please darken the most appropriate answer in the provided answer sheet.

Section A - English

Paragraph-I

Let us take the terms “subjective” and “objective” and determine whether we can make up our minds what we mean by them in a statement like this: “Philosophers and artists are subjective; scientists, objective.” First, the two terms make up a semantic pair. The one has no meaning without the other. We may define each by antonym with the other. We may define them by synonym by translating the last syllable and say that “subjective” pertains to a subject, and “objective” pertains to an object. By operation analysis we may say that subjects perceive or conceive objects in the process of knowing. The word “knowing” reminds us that we are talking about the central nervous system and should waste no time in examining our terms for their sensory, affective, and logical components. The terms are primarily logical. What, then, is the basic logical relation that establishes whatever meaning they have? What goes on in the world when a poet is being subjective, and how does it differ from what goes on when a scientist is being objective? When the poet sings “Drink to me only with thine eyes,” he is responding immediately or in retrospect to an object, his beloved, outside himself; but he is fundamentally concerned with the sensations and emotions which that object stimulates in him; and whether the object justifies his praise in the opinion of others, or indeed whether there actually is such an object, is quite irrelevant to his purpose, which is the weaving of a beautiful pattern of sound and imagery into a richly affective concept of feminine loveliness. This is to be subjective.

Now the scientist is primarily concerned with the identity and continuity of the external object that stimulates his response. It need not seem absurd to locate the Eiffel Tower, or Everest, or the Grand Canyon, for that matter, in the mind because it is so perfectly obvious that they can exist as the Eiffel Tower, Everest, or the Grand Canyon nowhere else. Perhaps we can move a little closer to our definition of “objective” by suggesting a distinction between an object and thing. Let us define object as the external cause of a thing. Whether objects “exist” is obviously not discussable, for the word “object” as used here must necessarily stand not for a thing but for a hypothesis. There is, for example, no way of telling whether objects are singular or plural, whether one should say the stimulus of the Eiffel Tower experience or the stimuli of the Eiffel Tower experience. If then, it is impossible even for the scientist to escape the essential subjectivity of his sensations, generalizations, and deductions, what do we mean by calling him objective?

1. Which of the following is NOT a semantic pair?
   a. chaos/order
   b. fact/fiction
   c. sitting/standing
   d. light/darkness

2. Which of the following pairs best exemplifies the subjective/objective opposition as defined by the passage?
   a. art/philosophy
   b. knower/known
   c. object/thing
   d. stimulus/stimuli

3. According to the passage, “objectivity” depends on the assumption that
   a. discrete objects exist external to the mind.
   b. one’s vocation in life should be logical.
   c. subjectivity is a cognitive weakness.
   d. science is a viable discipline.

4. Given the content of the first and second paragraphs, the reader expects that the third paragraph will
   a. explain how the scientist is objective.
   b. define the identity and conformity of external objects.
   c. analyze what it is to be subjective.
   d. discriminate between an object and a thing.

5. Faced with this statement, “What you see is just in your head,” the author of the passage would be likely to
   a. strongly disagree.
   b. agree that the statement is probably true.
   c. argue against the appropriateness of the word “just.”
   d. assume that the person making the statement is not a scientist.

Paragraph -II

The railroads played a key role in the settlement of the West. They provided relatively easy access to the region for the first time, and they also actively recruited farmers to settle there. The railroads are criticized for their part in settling the West too rapidly, with its resultant economic unrest. Of course there were abuses connected with building and operating the railroads, but it must be pointed out that they performed a useful service in extending the frontier and helping to achieve national unity. The real tragedy of the rapid settlement of the Great Plains was the shameful way in which the American Indians were treated. Threatened with the destruction of their whole mode of life, the Indians fought back savagely. Justice was almost entirely on the Indians’ side. The land was clearly theirs; frequently their title was legally certified by a treaty negotiated with the federal government. The Indians, however, lacked the military force and the political power to protect this right. Not only did white men encroach upon the Indians’ hunting grounds, but they rapidly destroyed the Indians’ principal means of subsistence—the buffalo. By 1869, the railroads had cut the herd in half, and by the middle of the 1880s, both the southern and northern herd were eliminated. The white man frequently killed the buffalo merely for sport, leaving the valuable carcass to rot in the sun. The plains Indians were considered different from the Indians encountered by the English colonists on the Atlantic coast. Mounted on horses, typical plains Indians were fierce warriors who could shoot arrows with surprising accuracy while galloping at top speed.

Although they quickly adapted themselves to the use of the rifle, the Indians were not equal to the firepower of the United States Army and thus were doomed to defeat. Theoretically, at least, the government tried to be fair to the Indians, but all too often the Indian agents were either too indifferent or corrupt to carry out the government’s promises conscientiously. The army frequently ignored the Indian Bureau and failed to coordinate its policies with the civilians who were nominally in charge of Indian affairs. The settlers hated and feared the Indians and wanted them exterminated. This barbaric attitude is certainly not excusable, but it is understandable in the context of the time.

6. The author’s attitude toward the treatment of American Indians by whites is one of
   a. qualified regret.
   b. violent anger.
   c. strong disapproval.
   d. objective indifference.

7. The author implies which of the following about the forces at work during the settlement of the Great Plains?
   a. The federal government represented the moral use of law.
   b. Justice was overcome by military firepower.
   c. Attempts by the government to be fair were rejected by the Indians.
   d. The settlers’ hatred and fear was offset by the Indians’ attempts at kindness.

8. Which of the following is concrete evidence that the white settlers did not need the buffalo for their own subsistence, as did the Indians?

a. More than half of the great buffalo herd had disappeared by 1869.
b. Nearly 15 million buffalo were killed within 20 years.
c. Buffalo carcasses were left rotting in the sun by whites.
d. The railroad brought necessary food and supplies to the white settlers from the East.

9. What is the point of the comparison between the plains Indians and the Indians encountered on the Atlantic coast?

a. The Atlantic coast Indians were not as abused by white settlers.
b. Because they were considerably better warriors than the Atlantic coast Indians, the plains Indians were a match for the United States military.
c. If Indians such as those on the Atlantic coast had populated the plains, there would have been no bloodshed of the white settlement.
d. The Indians encountered by English colonists posed no violent threat to the colonists.

10. The author of the passage would most likely disagree that

a. the United States government's policies toward the American Indians were shameful.
b. the land that the Indians fought to retain belonged to them.
c. numerous abuses were among the results of the railroads' rapid spread westward.
d. some American Indian tribes used sophisticated weapons brought by settlers.

Sentence Completion:

11. By the third day of being sick with the flu, her feelings of _____ were so strong all she could do was lie on the couch, unable even to get up to shower.

a. Vitality
b. Innuendo
c. Lethargy
d. Freshness

12. The tools found in the New Mexico excavation are _____ as a single implement might have several edges, each with a different use.

a. ancient
b. primitive
c. ferrous
d. versatile

13. All good comic writers use humor to ____, not to side-step the problems of human behavior.

a. amuse
b. avert
c. juxtapose
d. confront

14. The con artist was so _____ that he most often left his victims feeling pleased that they had given him their money.

a. Innocuous
b. cunning
c. maladroit
d. discrete

15. Along with a handful of other _____ the lawyer refuses to believe the evidence submitted by the FBI.

a. investigators
b. rationalists
c. legislators
d. skeptics

Word Analogies:

16. vigilante : police officer :: _____ : execution
    a. lynching
    b. villain
    c. criminal
    d. intern

17. particular : fussy :: _____ : subservient
    a. meek
    b. above
    c. cranky
    d. uptight

18. Boat: Wake:: …….: Track
    a. Foot
    b. Path
    c. Trail
    d. Railroad

19. tureen : _____ :: goblet : wine
    a. napkin
    b. soup
    c. spoon
    d. pilsner

20. Aviary: Feather :: _____ : scales
    a. Aquarium
    b. Zoo
    c. Carrel
    d. Penitentiary

Section B –Physics

1. According to the Faraday's law of electromagnetic induction, which of the following is true?

    a. Conservation of Charge
    b. Conservation of magnetic flux
    c. Conservation of energy
    d. Newton's law of equal and opposite forces

2. The series of visible spectral lines of hydrogen atom is known as:

    a. Balmer Series
    b. Lyman Series
    c. P fund Series
    d. Paschen Series

3. Which one of the following statements is true?

    a. both light and sound waves can travel in vacuum
    b. both light and sound waves in air are transverse
    c. the sound waves in air are longitudinal, while the light waves are transverse
    d. both light and sound waves in air are longitudinal

4. What is the wavelength of an electron?

a. $\frac{h}{2\pi}mv$
b. $\frac{h}{mv}$
c. $\frac{h}{2\pi mv}$
d. $\frac{2\pi}{mv}$

5. The energy band gap is maximum in:

a. metals
b. superconductors
c. insulators
d. semiconductors

6. In the middle of the deflection layer of reverse biased p-n junction the

a. electric field is zero
b. potential is zero
c. potential is maximum
d. electric field is maximum

7. The truth table given below represents:

Input		Output
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

a. AND-gate
b. OR-gate
c. NOR-gate
d. NAND-gate

8. When 10^{19} electrons are removed from a neutral metal plate, the electric charge on it is

a. -1.6 C
b. 1.6 C
c. 10^{19} C
d. 10^{-19} C

9. The heat produced by 100 W heater in 2 minutes is equal to

a. 10.5 kcal
b. 16.3 kcal
c. 2.8 kcal
d. 14.2 kcal

10. The color sequence in a carbon resistor is red, brown, orange, and silver. The resistance of the resistor is,

a. $21 * 10^3\ \Omega\ \pm 10\ \%$
b. $21 * 10^3\ \Omega\ \pm 5\ \%$
c. $12 * 10^1\ \Omega\ \pm 10\ \%$
d. $12 * 10^3\ \Omega\ \pm 5\ \%$

11. The main use of studying a hysteresis curve for a given material is to estimate the

a. current loss
b. power loss
c. voltage loss
d. hysteresis loss

12. Biot-Savart law can be expressed alternatively as

a. Coulomb's law
b. Ampere's circuital law
c. Ohm's law
d. Gauss' law

13. A wooden block is taken to the bottom of a deep, calm lake of water and then released. It rises up with a

a. constant acceleration
b. decreasing acceleration
c. constant velocity
d. decreasing velocity

14. If boiling point of a liquid is 95^0F, what will be the reading at Celsius scale?

a. 7^0C
b. 65^0C
c. 63^0C
d. 35^0C

15. The efficiency of a Carnot engine when source temperature is T1 and sink temperature is t2 will be

a. $\frac{T_1-T_2}{T_1}$
b. $\frac{T_2-T_1}{T_2}$
c. $\frac{T_1-T_2}{T_2}$
d. $\frac{T_1}{T_1}$

16. Time period of a simple pendulum will be double, if we

a. decrease the length 2 times
b. decrease the length 4 times
c. increase the length 2 times
d. increase the length 4 times

17. The length of a second pendulum at the surface of earth is 1m. The length of second pendulum at the surface of moon, where 'g' is $1/6^{th}$ that of earth's surface is

a. 1/6 times
b. 6 times
c. 1/36 times
d. 36 times

18. A source and listener is moving in the same direction with a velocity equal to half the velocity of sound, what is the change in frequency?

a. 0%
b. 100%
c. 25%
d. 50%

19. When a body moves with a constant speed along a circle

a. no work is done on it
b. no acceleration is produced in it
c. its velocity remains constant
d. no force acts on it.

20. A particle falls towards earth from infinity. Its velocity on reaching the earth would be

a. infinity
b. $\sqrt{2gR}$
c. $2\sqrt{gR}$
d. zero

21. If torque acting on a system is zero, which of the following is conserved

a. Force
b. Linear Momentum
c. Angular Momentum
d. Angular Impulse

22. The quark combination of antiproton is,

a. uud
b. udd
c. $\bar{u}\bar{u}\bar{d}$
d. $\bar{u}\bar{d}\bar{d}$

23. A body is at rest on the surface of the earth. Which of the following statements is correct?

a. No force is acting on the body
b. Only weight of the body acts on it
c. Net upward force is equal to the net upward force
d. None of the above statements is correct

24. $[M\ L^2T^{-2}]$ is the dimension formula of

a. Force
b. Moment of force
c. Momentum
d. Power

25. If a car at rest accelerations uniformly to a speed of 144 km/h in 20 sec, it covers a distance of

a. 1440 cm
b. 2980 cm
c. 20 m
d. 400 m

Section C– Mathematics

1. If A and B are subsets of U, then A – B is equal to

a. $A \cup \bar{B}$
b. $A \cap \bar{B}$
c. B – A
d. $\overline{A \cup B}$

2. If A, B and C are three subsets of the universal set U, then the associative law is

a. AU(BUC)=(AUB)UC
b. AU(B-C)=(A-B)UC
c. AUBUC=AU(BUC)
d. (AUB)UC=(AUBUC)

3. Let R be the set of real numbers. Function f : R→ R defined by f(x) = $5x - 3$ for all $x \in R$ is

a. One to one but not onto
b. bijective
c. Onto
d. Onto but not one to one.

4. If $2\cos^2 x + 4\sin^2 x = 3$, then the general solution is given by

a. $n\pi \pm \frac{\pi}{3}$
b. $n\pi \pm \frac{\pi}{6}$
c. $n\pi \pm \frac{\pi}{2}$
d. $n\pi \pm \frac{\pi}{4}$

5. A coin is tossed successively three times. What is the probability of getting 2 heads and one tail?

a. $\frac{1}{8}$
b. $\frac{1}{4}$
c. $\frac{3}{8}$
d. none of the above

6. If a, b and c be the sides of a triangle ABC and a = 2, b = $\sqrt{6}$, c = $\sqrt{3}+1$ then

a. A = 35^0
b. B = 45^0
c. B = 65^0
d. C = 75^0

7. $\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3} =$

a. $\frac{\pi}{6}$
b. $\frac{\pi}{4}$
c. $\frac{\pi}{2}$
d. π

8. If $tan2x = tanx$ then $x =$

a. $n\pi$
b. $n\pi \pm 2$
c. $(2n+1)\frac{\pi}{2}$
d. $(2n-1)\frac{\pi}{2}$

9. For what value of k, $x + 3$ is a factor of $3x^2 + kx + 6$?

a. 8
b. 9
c. 11
d. 15

10. If a, b, c are in G.P. then $\frac{1}{a+b}$, $\frac{1}{2b}$, $\frac{1}{b+c}$ are in

a. A.P.
b. G.P.
c. H.P.
d. None of the above

11. $1 + w + w^2$ =

a. w
b. $-w$
c. 0
d. 1

12. The sum $1 + \frac{3}{2} + \frac{5}{4} + \frac{7}{8} +$ ... ... to infinity, is

a. $\frac{1}{2}$
b. 2
c. 4
d. 6

13. The value of m for which the straight lines $y = x + 1$, $y = 2(x + 1)$ and $y = mx + 3$ are concurrent, is

a. -1
b. 2
c. 3
d. -3

14. Radius of the circle $x^2 + y^2 + 4x - 6y + 4 = 0$, is

a. 3
b. 4
c. 5
d. 6

15. The area of triangle formed by the intersection of the lines $x + y - 4 = 0$, x-axis and y- axis is:

a. 4 square units.
b. 16 square units
c. 8 square units.
d. None of the above.

16. The angle between pair of straight lines $7\mathrm{x}^2 + 8\mathrm{xy} + \mathrm{y}^2 = 0$ is

a. $\tan^{-1}\left(\pm\frac{1}{3}\right)$
b. $\tan^{-1}\left(\pm\frac{1}{6}\right)$
c. $\tan^{-1}(\pm\frac{3}{4})$
d. $\tan^{-1}(\pm\frac{1}{7})$

17. The value of $\lim_{x\to\infty} \frac{\sin x}{x}$ is

a. -1
b. 0
c. 1
d. None of the above

18. What is the slope of the line whose equation is 3x - 5y - 16 = 0?

a. 3/5
b. 5/3
c. -5/3
d. 16

19. $\lim_{x\to\theta} \frac{x\cos\theta - \theta\cos x}{x-\theta}$

a. $\theta \sin\theta + \cos\theta$
b. $\theta \sin\theta - \cos\theta$
c. $\theta \sin\theta$
d. $\theta \cos\theta$

20. The function f(x) = $\frac{(x-1)}{(x-2)(x+3)}$ is discontinuous at

a. -2 and 3
b. 2 and 3
c. 2 and -3
d. -2 and -3

21. Let f(x) = $\begin{cases} \mathrm{kx} + 3 \ for\ x \geq 2 \\ 3\mathrm{x} - 1 \ for\ x < 2 \end{cases}$. For what value of k, f(x) is continuous at x = 2?

a. 0
b. -1
c. 1
d. 2

22. The derivative of $sinx$ is

a. $cosec\ x$
b. $\cos x$
c. $1/\ cosec\ x$
d. $1/\cos x$

23. $\int \frac{1}{x} \sin(\log\ x)\, dx$ =

a. $\cos(log\ x) + c$
b. $-\cos(log\ x) + c$
c. $\sin(log\ x) + c$
d. $-\sin(log\ x) + c$

24. The minimum value of the function f(x) = $2x^3 - 9x^2 + 12x - 4$ is

a. -2
b. -1
c. 0
d. $\sqrt{2}$

25. $\int_{\frac{-\pi}{3}}^{\frac{\pi}{3}} cos\ t\ dt$ =

a. $\sqrt{2}$
b. $\sqrt{3}$
c. $\sqrt{5}$
d. 0

Section D – IQ

1. Which one of the following words does not belong with the others?

   a. Mother
   b. Aunt
   c. Sister
   d. Cousin

2. How many cases do you need if you have to pack 112 pairs of shoes into cases that each hold 28 shoes?

   a. 14
   b. 8
   c. 7
   d. 11

3. 6121135 is to flame as 21215120 is to ?

   a. voice
   b. bald
   c. bloat
   d. castle

4. MOSAIC : TILE ::

   a. Document : Author
   b. Portrait : Paint
   c. Fabric : Tapestry
   d. Coverlet : Cloth

5. In a certain code language, if TAIT is coded as 0110, then the code for RAHANE is

   a. 011101
   b. 110101
   c. 011101
   d. 010101

6. Which country is known as the world's sugar bowl?

   a. Cuba
   b. China
   c. USA
   d. India

7. Find the wrong number in the series: 6, 15, 35, 99, 143, 221

   a. 143
   b. 99
   c. 35
   d. 15

8. Which logically is the odd one out?

   a. Dosage
   b. Before
   c. Curate
   d. simple

9. Order of the last 15 letters of the English alphabetical series is reversed. Find the 20th letter from the beginning.

a. Q
b. R
c. S
d. T

10. Which of these letter combinations does NOT belong?

a. VBN
b. YGR
c. CVB
d. UIO