Airforce Group X

70 Questions

Que. 1 A carnot engine is working between the temperature range of 227°C and 127°C. If the heat absorbed by the engine is 10^4 J, the the work done by the engine is:

1. 2×10^4 J
2. 6×10^4 J
3. 2×10^3 J
4. 5×10^3 J

Solution   Correct Option - **3**

Que. 2 Pressure of an ideal gas is increased by keeping temperature constant. The kinetic energy of molecules

1. Decreases
2. Increases
3. Remains same
4. Increases or decreases depending on the nature of gas

Solution   Correct Option - **3**

Que. 3 The resistivity of the material depends on:

1. Length of the wire
2. Diameter of the wire
3. Density of the wire
4. Material of the wire

Solution   Correct Option - **4**

Que. 4 Which one of the following is the dimensional formula resistivity?

1. $ML^3T^{-3}A^{-2}$
2. $ML^3T^3A^2$
3. $ML^3T^3A^{-2}$
4. $ML^{-3}T^{-3}A^{-2}$

Solution   Correct Option - **1**

Que. 5 Kepler's third law of motion states that the time period T, of the planet around the sun is directly proportional to

1. $a^{2/3}$
2. a
3. $a^{3/2}$
4. a^3

Solution   Correct Option - **3**

Que. 6 The direction of centripetal acceleration with respect to the velocity in a uniform circular motion is

1. 0°
2. 45°
3. 90°
4. 180°

Solution Correct Option - **3**

Que. 7 Modulus of rigidity of ideal liquids is

1. some finite small non - zero value
2. zero
3. unity
4. infinity

Solution Correct Option - **2**

Que. 8 What is the minimum number of forces acting on an object in a plane that can produce a zero resultant force?

1. 2
2. 3
3. 4
4. 5

Solution Correct Option - **1**

Que. 9 An electron and a proton have the same kinetic energy. Then, the ratio of de Broglie wavelengths of proton and electron will be nearly:

1. 1 : 43
2. 1 : 1838
3. 1838 : 1
4. 43 : 1

Solution Correct Option - **1**

Que. 10 Potential at any point inside a charged hollow sphere

1. Increases with distance
2. Is a constant
3. Decreases with distance from centre
4. Is zero

Solution Correct Option - **2**

Que. 11 Which of the following is not correct about the Biot-Savart's law?

1. The magnitude of the magnetic field is directly proportional to the current through the conductor.
2. The magnitude of the magnetic field is directly proportional to the length of the current element.
3. The magnitude of the magnetic field is directly proportional to the square of the distance from the current element.

4. The magnitude of the magnetic field is inversely proportional to the square of the distance from the current element

Solution Correct Option **- 3**

Que. 12 An object stands straight in front of a mirror at a distance of 30 cm from it. He sees his erect image whose height is 1/5 of his real height. The mirror he is using is

1. plane mirror
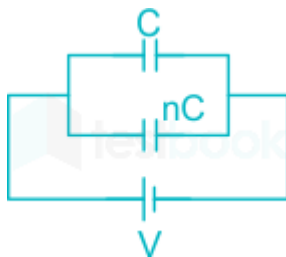2. concave mirror
3. convex mirror
4. None of the above

Solution Correct Option **- 3**

Que. 13 The magnetic force, experienced by a moving charged particle in the magnetic field, depends on _____.

1. velocity of charge particle
2. charge of charge particle
3. magnetic field
4. All of the above

Solution Correct Option **- 4**

Que. 14 Find the equivalent capacitance of all the capacitors.

1. $C(1 + n)$
2. $C/(1 + n)$
3. $(1 + n)/C$
4. $C^2(1 + n)$

Solution Correct Option **- 1**

Que. 15 Choose the CORRECT SI unit of coefficient of viscosity.
1. J/s
2. N/s
3. $N.s/m^2$
4. All are wrong

Solution Correct Option **- 3**

Que. 16 A swinging pendulum has its maximum acceleration at
1. The bottom of the swing

2.   The two extremities of the swing

3.   Every point of the swing

4.   No particular position of the pendulum

Solution Correct Option - **2**

Que. 17 The wavelength range of microwave is-

1.   1 mm to 0.1 m

2.   1 mm to 100 km

3.   390 nm to 750 nm

4. 10^{-8} m to 400 nm

Solution   Correct Option - **1**

Que. 18 When a body is taken from the equator to the poles, its weight

1.   Remains constant

2.   Increases

3.   Decreases

4.   Increases at N pole and decreases at S–pole

Solution   Correct Option - **2**

Que. 19 The energy of a particle executing S.H.M. depends on

1.   initial stage

2.   amplitude

3.   frequency

4.   amplitude and frequency

Solution   Correct Option - **4**

Que. 20 EMF of a cell depends upon

1.   distance between plates

2.   area of plates immersed in electrolyte

3.   temperature of electrolyte used in cells

4.   all of the above

Solution   Correct Option - **3**

Que. 21 The fraction of a ball floating inside the liquid depends upon

1.   Density of the ball

2.   Density of the liquid

3.   Mass of the ball

4.   Both 1 and 2

Solution   Correct Option - **4**

Que. 22 Which of the following is not a part of Ideal gas law equation?

1. Avogadro's law
2. Boyle's law
3. Charles' law
4. None. They are all a part of it

Solution Correct Option - **4**

Que. 23 A motorcycle starts from rest and accelerates uniformly to a speed of 54 kmph over a distance of 450 m. Then the acceleration of the motorcycle is

1. 1.33 m/s^2
2. 0.40 m/s^2
3. 0.25 m/s^2
4. 2 m/s^2

Solution Correct Option - **3**

Que. 24 The phenomenon of rainbow is due to the combined effect of all of the following properties of light except _____.

1. dispersion
2. refraction
3. reflection
4. polarization

Solution Correct Option - **4**

Que. 25 For L-C-R series A.C. circuit, in resonating conditions which is true?

1. Minimum current
2. Minimum impendance
3. Power loss minimum
4. Minimum power factor

Solution Correct Option - **2**

Que. 26 Find the standard deviation of 2, 4, 6, 8, and 10

1. 2.8
2. 2.6
3. 2.4
4. 2.2

Solution Correct Option - **1**

Que. 27 Find $\frac{d^2 \tan^{-1} x}{dx^2}$

1. $\frac{-2x}{(1+x^2)^2}$
2. $\frac{-2}{(1+x^2)^2}$
3. $\frac{-1}{(1+x^2)^2}$

4. $\frac{2x}{(1+x^2)^2}$

Solution Correct Option - **1**

Que. 28 What is the area of the portion of the curve y = sin x, lying between x = 0, y = 0 and x = 2π ?

1. 1 square unit
2. 2 square units
3. 4 square units
4. 8 square units

Solution Correct Option - **3**

Que. 29 If $sin\ x = \frac{\sqrt{5}}{3}$ and 0 < x < π/2 then find the value of sin 2x ?

1. $\frac{\sqrt{5}}{9}$
2. $\frac{4\sqrt{5}}{9}$
3. $\frac{2\sqrt{5}}{9}$
4. None of these

Solution Correct Option - **2**

Que. 30 If s = 2t³ – 4t² + 50 describes the motion of a particle, then its velocity (in unit/sec) when the acceleration vanishes, is

1. $\frac{16}{3}$
2. $\frac{8}{3}$
3. $\frac{-8}{3}$
4. $\frac{-16}{3}$

Solution Correct Option - **3**

Que. 31 What is the degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^{5/2} = \left(\frac{dy}{dx}\right)^3$?

1. 3
2. 5
3. 6
4. $\frac{5}{2}$

Solution Correct Option - **2**

Que. 32 If the nth term of A.P. is 2n - 1, so find the sum of nth term.

1. $n^2 + 1$
2. $n^2 + 2$
3. n^2
4. $n^2 - 1$

Solution Correct Option - **3**

Que. 33 For all x such that x > 0, f(x) = log$_8$ x. What does f^{-1}(x) equal?

1. 8^x
2. x^8
3. 8√x
4. log$_x$ 8

Solution Correct Option - **1**

Que. 34 Find $\lim\limits_{x \to 1} \dfrac{\sqrt{f(x)} - 1}{x - 1}$, if f(1) = 1 and f'(1) = 3.

1. 1
2. 2
3. 3
4. None of these.

Solution Correct Option - **4**

Que. 35 Find equation of directrix of parabola, x^2 = - 22y .

1. 2y - 11 = 0
2. 2x - 11 = 0
3. 2x + 11 = 0
4. 2y + 11 = 0

Solution Correct Option - **1**

Que. 36 Three groups of children contain 3 girls and 1 boy; 2 girls and 2 boys: 1 girl and 3 boys. One child is selected at random from each group. The probability that the three selected consist of 1 girl and 2 boys is

1. 13/32
2. 2/32
3. 9/32
4. 1/32

Solution Correct Option - **1**

Que. 37 In how many ways a 3-digit number can be formed from the digits 1, 4, 3, 6, 5 and 7, such that the number is divisible by 5 and none of digit is being repeated?

1. 5
2. 10
3. 20
4. 15

Solution Correct Option - **3**

Que. 38 Find the number of terms in $(\sqrt{3} + 1)^8$

1. 10
2. 7
3. 8
4. 9

Solution   Correct Option - **4**

Que. 39 Find $\frac{dy}{dx}$ if $xy + y^2 = \tan x + y$?

1. $\frac{sec^2 x - y}{x + 2y + 1}$

2. $\frac{cosec^2 x - y}{x + 2y - 1}$

3. $\frac{sec^2 x - y}{x + 2y - 1}$

4. None of these

Solution   Correct Option - **3**

Que. 40 If the points (-2, -5), (2, -2) and (8, a) are collinear, then the value of a is:

1. $-\frac{5}{2}$

2. $\frac{5}{2}$

3. $\frac{3}{2}$

4. $\frac{1}{2}$

Solution   Correct Option - **2**

Que. 41 Order of $\sqrt{1 + \left(\frac{d^2 y}{dx^2}\right)^2} = 3y\frac{d^3 y}{dx^3}$ is

1. 1
2. 2
3. 3
4. None

Solution   Correct Option - **3**

Que. 42 Find the minor of element **6** in the determinant $\Delta = \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$.

1. 6
2. -6
3. 9
4. 8

Solution   Correct Option - **2**

Que. 43

If $A = \begin{bmatrix} 1 & -2 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 6 \\ 1 & 3 \end{bmatrix}$ then AB is equal to

1. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

2. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

3. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

4. None of the above

Solution Correct Option - **1**

Que. 44 Find Y(x) if $dy/dx = x^3\log(4x)$.

1. $\log(4x)x^3/3 + x^4/4$

2. $\log(4x)x^4/4 + x^4/16$

3. $\log(4x)x^3/3 - x^4/4$

4. $\log(4x)x^4/4 - x^4/16$

Solution   Correct Option - **4**

Que. 45 Find the multiplicative inverse of $2 + 3i$

1. $\frac{2-3i}{13}$

2. $\frac{2+3i}{13}$

3. $\frac{-2-3i}{13}$

4. $\frac{-2+3i}{13}$

Solution   Correct Option - **1**

Que. 46 The maximum value of $xy + 5$ subject to $2x + y = 4$ is:

1. 4

2. 3

3. 8

4. 7

Solution   Correct Option - **4**

Que. 47 If $4x^2 + 2x - 6 = 0$ has the real roots a and b find $(a - b)^2$

1. 2.25

2. 9

3. 6.25

4. 4

Solution   Correct Option - **3**

Que. 48 The equation of the circle passing through (4, 5) having the centre at (2, 2) is

1. $x^2 + y^2 + 4x + 4y - 5 = 0$
2. $x^2 + y^2 - 4x - 4y - 5 = 0$
3. $x^2 + y^2 - 4x = 13$
4. $x^2 + y^2 - 4x - 4y + 5 = 0$

Solution Correct Option - **2**

Que. 49 Find the length of the minor axis if the equation of the ellipse is $\frac{x^2}{9} + \frac{y^2}{4} = 1$

1. 4
2. 9
3. 2
4. 3

Solution Correct Option - **1**

Que. 50 If U = {1, 2, 3, 4, 5, 6} is a universal set, A = {2, 3} and B = {3, 4, 5} then find A ' ∩ B'?

1. {1, 2, 4, 6}
2. {1, 3, 4, 5}
3. {1, 6}
4. None of these

Solution Correct Option - **3**

Que. 51 **Choose the correct antonym of the following word from the options given below:**

Shallow

1. deep
2. long
3. short
4. brief

Solution Correct Option - **1**

Que. 52 **Give one word for the following expression:**

Liable to be easily broken.

1. Soft
2. Brittle
3. Unbreakable
4. Mortal

Solution Correct Option - **2**

Que. 53 **Choose an appropriate word from the options to suitably fill the blank in the sentence below so that the sentence makes sense, both grammatically and contextually.**

All of us are devoted _____ one another.

1. of
2. at

3. to
4. for

Solution Correct Option - **3**

Que. 54 **Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.**

Ram always respected (1)/ his boss as he was (2)/ senior than him. (3)/ No error (4)

1. senior than him
2. No error
3. his boss as he was
4. Ram always respected

Solution Correct Option - **1**

Que. 55 **Identify the segment in the sentence which contains the grammatical error.**

Neither Amit nor Raju are staying with his parents in Mumbai.

1. are staying
2. in Mumbai
3. with his parents
4. Neither Amit nor Raju

Solution Correct Option - **1**

Que. 56 **Select the correct passive form of the given sentence.**

Animals cannot make tools.

1. Tools could not be made by animals.
2. Tools cannot be made by animals.
3. Animals cannot be made by tools.
4. Tools are not to be made by animals.

Solution Correct Option - **2**

Que. 57 **Direction: Read the following passage and answer the following questions:**

Once there lived a greedy man in a small town. He was very rich. He loved gold and all fancy things. But he loved his daughter more than anything. One day, he chanced upon a fairy. The fairy's hair was caught in a few tree branches. He helped her out, but as his greediness took over, he realised that he had an opportunity to become richer by asking for a wish in return (by helping her out). The fairy granted him a wish. He said, "All that I touch should turn to gold." And his wish was granted by the grateful fairy.

The greedy man rushed home to tell his wife and daughter about his wish, all the while touching stones and pebbles and watching them convert into gold. Once he got home, his daughter rushed to greet him. As soon as he bent down to scoop her up in his arms, she turned into a gold statue. He was devastated and started crying and trying to bring his daughter back to life. He realised his **folly** and spent the rest of his days searching for the fairy to take away his wish.

Why did the greedy man rescue a fairy?

1. Because he was a very good person.
2. Because he thought that he had an opportunity to become richer.
3. Because of his acquaintance with the fairy.

4.   Because the fairy helped him earlier.

Solution Correct Option - **2**

Que. 58 Why did the greedy man search for the fairy to take away his wish?

1.   Because he lost his beloved daughter due to that wish.
2.   Because he grabbed enough money for rest of his life.
3.   Because her daughter asked her to do so.
4.   Because he was not satisfied with that wish and wanted to become richer.

Solution   Correct Option - **1**

Que. 59 What lesson do we learn from this story?

1.   Greed will always lead to downfall.
2.   It is difficult to trust people who lie, so it's important to always be truthful.
3.   We can choose how to respond to a difficult situation.
4.   Never judge someone by the way they look.

Solution   Correct Option - **1**

Que. 60 What is the synonym of the word **"Folly"**?

1.   Foolishness
2.   Wealth
3.   Idiot
4.   Secret

Solution   Correct Option - **1**

Que. 61 **In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the Idiom/ Phrase.**

Blessing in disguise

1.   Underappreciated honesty and strength
2.   Some good unrecognized and unappreciated initially
3.   Undervalued to an extent that something good dies
4.   Rising from being of little to great importance

Solution   Correct Option - **2**

Que. 62 **Direction: Select the word or group of words you consider most appropriate for the blank space and indicate your response accordingly.**

If I were a bird, _____.

1.   I could be flying.
2.   I would fly the whole day.
3.   I can fly for the whole day.
4.   I will be flying all the day

Solution   Correct Option - **2**

Que. 63 **Direction**: Choose the most appropriate answer and fill in the blanks:

We need a roof _____ our heads.

1. across
2. over
3. through
4. into

Solution Correct Option - **2**

Que. 64 **Directions: Fill in the blanks with the most appropriate word in the following sentence.**

If you had worked hard, you _____.

1. will pass
2. would pass
3. would have passed
4. had been pass

Solution Correct Option - **3**

Que. 65 **Direction**: Select the option that is similar in meaning to the given word and mark your response accordingly.

Antique

1. Virtue
2. Commercial
3. Ancient
4. Non-commercial

Solution Correct Option - **3**

Que. 66 **Direction**: Select the option that is similar in meaning to the given word and mark your response accordingly.

Disorder

1. Sequencing
2. Structure
3. Disturbance
4. None of these

Solution Correct Option - **3**

Que. 67 **Direction: Choose the most appropriate answer and fill in the blanks.**

The adjective form of **'Fury'** is _____.

1. Ferocity
2. Ferocities
3. Furious
4. Fur

Solution Correct Option - **3**

Que. 68 **Direction: Choose the correct spelling of the word among the following:**

1. Eagaling
2. Eagernes
3. Enthusiasm
4. Eccentrecity

Solution   Correct Option - **3**

Que. 69 **Direction: Change the Narration-**

She said to me, "When will you give me your books?"

1. She asked me when I shall give her my books.
2. She asked me when I would give her my books.
3. She asked me when I will give her my books.
4. She asked me when I can give her my books.

Solution   Correct Option - **2**

Que. 70 **Direction: In the following sentences, four words or phrases have been underlined. One of them is incorrect. Choose the incorrect word or phrase from the options.**

This is the first time we are meeting him.

1. This
2. first time
3. are meeting
4. him

Solution   Correct Option - **3**