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Army
Havildar SAC

Previous Year Paper
2025

100 Questions

Que. 1 For which value of k, there is no solution to the equations -

x - y = 5

kx - 4y = 1

1. 4
2. 2
3. 5
4. 0

Correct Option **- 1**

Que. 2 Let p(x) be a polynomial with real co-efficients, p(0) = 1 and p'(x) > 0 for all x ∈ ℝ. Then

1. p(x) has at least two real roots
2. p(x) has only one positive real root
3. p(x) may have negative real root
4. p(x) has infinitely many real roots

Correct Option **- 3**

Que. 3 Solve it: ∫ (3sin x - 4cos x + 5 sec² x - 2 cosec² x) dx?

1. (-3sin x - 4cos x + 5 tan x + 2 cot x + c)
2. (-300sx - 4tan x + 5tan x + 2cot x + C)
3. (-3cos x + 5tan x + 2cot x + C)
4. (-3cos x - 4sin x + 5 tan x + 2cot x + C)

Correct Option - **4**

Que. 4 If the radius of a tyre is 7 cm, what distance will it travel in 50 rotations?

1. 7m
2. 50 m
3. 44 m
4. 22 m

Correct Option **- 4**

Que. 5 10 men complete a piece of work in 20 days then in how many days 20 men will complete the work?

1. 10 days
2. 20 days

3. 16 days

4. 18 days

Correct Option - **1**

Que. 6 If sec α = 13/5, where 270° < α < 360° then what is the value of sin α?

1. 12/13

2. 5/13

3. -13/12

4. -12/13

Correct Option - **4**

Que. 7 Which of the following equation is correct?

1. Sinθ = Perpendicular / Base

2. Sinθ = Base / Perpendicular

3. Sinθ = Base / Hypotenuse

4. Sinθ = Perpendicular / Hypotenuse

Correct Option - **4**

Que. 8 A is the centre of circle with radius 8 cm and B is the centre of circle whose diameter is 8 cm. If these two circles touch externally, then find the area of the circle with diameter AB

1. 64 π

2. 144 π

3. 36 π

4. 256 π

Correct Option - **3**

Que. 9 ∫ dx/(x²-a²)

1. 2a log (x-a)

2. 2a-sec(x-a)+ C

3. 1/2a log|(x-a)/(x+a)|

4. a- Sin(x-a)+ cosec(x-a) +C

Correct Option - **3**

Que. 10 Evaluate the following expression:

$$\left(\frac{x_1}{x_2}\right)^2 \cdot \left(\frac{x_2}{x_3}\right)^2 \cdot \left(\frac{x_3}{x_1}\right)^2 = ?$$

1. $x_1 x_2 x_3$

2. 1
3. $x_2{}^2$
4. x^6

Correct Option - **2**

Que. 11 Solve it: $\int 1/x^{1/3} \, dx$?

1. $(3/2)x^{2/3} + C.$
2. $(1/2)x^{2/3} + C.$
3. $(2/3)x^{2/3} + C.$
4. $(3/2)x^{3/2} + C.$

Correct Option - **1**

Que. 12 Solve it: $\sin x = 1$ then x is

1. $\pi / 4$
2. $2 \pi / 3$
3. $\pi / 2$
4. $\pi / 3$

Correct Option - **3**

Que. 13 What is the sum of the squares of the roots of the equation $x^2+2x-143 = 0$?

1. 170
2. 190
3. 290
4. 180

Correct Option - **3**

Que. 14 Differentiate $\cot^{-1}(x)$ with respect to x?

1. $1/(1+2x^2)$
2. $-1/(1+x^2)$
3. $1/(1-x^2)$
4. $1/x^2$

Correct Option - **2**

Que. 15 Sachin Tendulkar has a certain average for 11 innings in the 12th inning he scores 120 runs and thereby increases average by 5 runs. His new average is

1. 66

2. 60
3. 65
4. 62

Correct Option **- 3**

Que. 16 | Choose the correct option 9 sec² A-9 tan² A = _____ ?

1. 8
2. 1
3. 0
4. 9

Correct Option **- 4**

Que. 17 | Differentiate $e^{\cos x}$ with respect to x?

1. $- e^{\cos x} \sin x$
2. $- e^{\cos x} \cos x$
3. $2e^{\cos x} \sin x$
4. $- e^{\sin x} \sin x$

Correct Option **- 1**

Que. 18 | If $y = \sec(\tan^{-1} x)$, then find dy/dx at x = 1?

1. 1
2. $1/\sqrt{2}$
3. ½
4. -1

Correct Option **- 2**

Que. 19 | 624 rupees have been distributed among three friends in the ratio of ½ : ⅓ : ¼ . Find out the share of third friend?

1. Rs 190
2. Rs 156
3. Rs 180
4. Rs 144

Correct Option **- 4**

Que. 20 | If (n + 10) = 12 (n - 1), then find the value of n?

1. 2

2. 3
3. 6
4. 5

Correct Option **- 1**

Que. 21 If $^nC_r : {^nC_{r+1}} = 1 : 2$ and $^nC_{r+1} : {^nC_{r+2}} = 2 : 3$ then find the value of n and r?

1. n=12, r=2
2. n=2, r=12
3. n=14, r=4
4. n=4, r=14

Correct Option **- 3**

Que. 22 Solve it: $\int \tan x \, dx$.

1. -ln Sin x + C
2. -ln Cos x + C
3. ln Cos x + C
4. ln x + C

Correct Option **- 2**

Que. 23 $\int$ Sin mx cos nx =?

1. 1/2sin(m)-Cos(n)x
2. (m+n)x
3. 1/2sin(m+n)x
4. ½[sin(m+n)x + sin(m-n)x]

Correct Option **- 4**

Que. 24 Differentiate $(2x+3)^5$ with respect to x?

1. $10(2x+3)^4$
2. $(2x+3)^4$
3. $10(x+3)^4$
4. $5(2x+3)^3$

Correct Option **- 1**

Que. 25 If the distance between the points (7, 1, -3) and (4, 5, λ) is 13 units, then what is one of the values of λ?

1. 8
2. 20

3. 9
4. 10

Correct Option - **3**

Que. 26 If sinθ + cosθ = √3, then find the value of tanθ + cotθ?

1. √3
2. √2
3. 1
4. 2

Correct Option - **3**

Que. 27 If one of the roots of the equation $x^2+ax-b=0$ is 1, then what is the value of (a-b)

1. -1
2. -2
3. 2
4. 1

Correct Option - **1**

Que. 28 In a Geometric Progression the first term is 5 and the common ratio is 2. Find out the 8th term of Progression?

1. 1280
2. 160
3. 640
4. 256

Correct Option - **3**

Que. 29 Find the first four terms of the sequence an = cos (nπ / 2)?

1. 1, 0, 1/2, 1
2. 1, 0, -1/2, 1/2
3. 1, 0, -1, 0
4. 0, -1, 0, 1

Correct Option - **4**

Que. 30 The ratio of radii of two cones is 3:4 and the ratio of their heights is 4:3. Then the ratio of their volumes will be

1. 3:4
2. 4:3

3. 3:5
4. 5:3

Correct Option - **1**

Que. 31 | Solve it: $\int 2/(x+3)\, dx$?

1. $2(x+3)/\ln x + C$
2. $2 \ln (x+3) + C$
3. $2(x+3)/2\ln x + C$
4. $2(x+3)/\ln 2 + C$

Correct Option - **2**

Que. 32 | Find the value of cos 1°cos 2°cos 3°cos 4°..... cos 900°?

1. 1/2
2. 3/2
3. None of these
4. 0

Correct Option - **4**

Que. 33 | What is the HCF of 7/9, 14/15 and 7/10?

1. 7/90
2. 14/45
3. 7/45
4. 7/675

Correct Option - **1**

Que. 34 | If $y = \cos^2 x^2$, find dy/dx?

1. $-4x \cos x^2 \cos x^2$
2. $-4x \cos x^2 \sin x^2$
3. $-4x \sin x^2 \sin x^2$
4. $4x \cos x^2 \sin x^2$

Correct Option - **2**

Que. 35 | In a class of 30 students, the average age is 10 years, if the age of the teacher is also included the average increases by 1, find the age of the teacher?

1. 41
2. 30
3. 31

4. 40

Correct Option **- 1**

Que. 36 $\int_1^4 x\sqrt{x}\,dx$

1. 12.8
2. 14
3. 7
4. 12.4

Correct Option **- 4**

Que. 37 The cost of 12 chairs and 15 tables is Rs 58968. What is the cost of 4 chairs and 5 tables?

1. Rs 29484
2. Rs 34567
3. Rs 19656
4. Rs 39312

Correct Option **- 3**

Que. 38 If nP4: n-1P3 = 9:1, then find the value of n?

1. 1
2. 5
3. 9
4. 7

Correct Option **- 3**

Que. 39 Radius of two cylinders are in the ratio of 2:1 and their volumes are equal. The ratio of their heights will be?

1. 1:4
2. 3:4
3. 1:6
4. 1:2

Correct Option **- 1**

Que. 40 A bag contains 8 red and 5 white balls. If 3 balls are drawn randomly then find the probability that one ball of Red colour and two balls of white colour are drawn? average after six innings? other side working together can finish the work?

1. 20/143
2. 40/143

3. 80/287
4. 40/153

Correct Option **- 2**

Que. 41 Sum of a number and twice its square is 105. Find out that number?

1. 9
2. 7
3. 5
4. 6

Correct Option **- 2**

Que. 42 Which term of the Geometric Progression (GP) 5, 10, 20 40, ------is 1280?

1. 9th
2. 11th
3. 8th
4. 10th

Correct Option **- 1**

Que. 43 The principal value of $\sin^{-1}(1/\sqrt{2})$............

1. $\pi/2$
2. $\pi/3$
3. $\pi/4$
4. π

Correct Option **- 3**

Que. 44 In an A.P., $S_n = 5$, a = 5/7 and d = -1/21. Find the value of n?

1. 5, 9
2. 15, 20
3. 21, 10
4. 23, 47

Correct Option **- 3**

Que. 45 Find the volume of a cone of height 3 cm and slant height 5 cm?

1. 53 cm³
2. 50.24 cm³
3. 52 cm³

4. 49.3 cm^3

Correct Option - **2**

Que. 46 $d/dx (\log_a x)$

1. 0
2. $1/x \ln a$
3. log a/x
4. 1/x"

Correct Option - **2**

Que. 47 $\int_4^1 x\sqrt{x}\,dx = ?$

1. 7
2. 12.4
3. 14
4. 12.8

Correct Option - **2**

Que. 48 If $\log_a (ab) = x$, then find $\log_b (ab)$?

1. $x / (1 + x)$
2. $x / (x - 1)$
3. $1 / x$
4. $x / (1 - x)$

Correct Option - **2**

Que. 49 If the equations $2x^2\ 7x+3=0$ and $4x^2+ax-3=0$ have a common root, then what is the value of a?

1. -11 or 4
2. 11 or 4
3. -11 or -4
4. 11 or -4

Correct Option - **4**

Que. 50 If P(A) = P(B) = x and P(A ∩ B) = P(A ∪ B) = 1/3, then find the value of x?

1. 1/6
2. 1/3
3. 1/2
4. 1/4

Correct Option - **2**

Que. 51 | When lunar eclipse happens, then _____.

1. The moon comes between the Earth and the Sun
2. The Earth comes between the Moon and the Sun
3. The sun comes between the Moon and the Earth
4. The Mars comes between the Earth and the Moon

Correct Option - **2**

Que. 52 | One horse power is equal to_____?

1. 764 W
2. 738 W
3. 726 W
4. 746 W

Correct Option - **4**

Que. 53 | Kirchhoff's first law i.e. i=0 at a junction is based on the law of conservation of _____.

1. Energy
2. Momentum
3. Charge
4. Angular momentum

Correct Option - **3**

Que. 54 | A stretched rubber has _____.

1. Decreased potential energy
2. Decreased kinetic energy
3. Increased kinetic energy
4. Increased potential energy

Correct Option - **4**

Que. 55 | The co-efficient of restitution e for a perfectly elastic collision is _____.

1. 0
2. 1
3. ∞
4. -1

Correct Option - **2**

Que. 56 Hooke's law essentially defines _____

1. Yield point
2. Strain
3. Stress
4. Elastic limit

Correct Option - **4**

Que. 57 A boy sitting on the top most berth in the compartment of a train which is just going to stop on a railway station, drops an apple aiming at the open [1] hand of his brother situated vertically below his hands at a distance of about [2] 2 mtr. The apple will fall _____?

1. Slightly away from the hand of his brother in the opposite direction of motion of the train
2. Slightly away from the hand of his brother in the direction of motion of the train
3. Remain in the air
4. Precisely in the hand of his brother

Correct Option - **2**

Que. 58 What is the audible range of the average human ear?

1. 20 HZ to 15000 HZ
2. 15 HZ to 20000 HZ
3. 15 HZ 10 15000 HZ
4. 20 HZ to 20000 HZ

Correct Option - **4**

Que. 59 Which of the following forces hold together the protons and neutrons in the nucleus of an atom?

1. Gravitational
2. Magnetic
3. Frictional
4. Nuclear

Correct Option - **4**

Que. 60 The unit of charge in SI system is

1. coulomb
2. volt
3. ampere
4. joule

Correct Option - **1**

Que. 61 By increasing the temperature, the conductance of a conductor and a semiconductor _____

1. Increases for both
2. Increases, decreases
3. Decreases for both
4. decreases, Increases

Correct Option - **4**

Que. 62 A man waves his arm while walking. This is to:

1. Balance the effect of earth's gravity
2. Increase the velocity
3. Ease the tension
4. Keep constant velocity

Correct Option - **1**

Que. 63 The tides in sea are primarily due to _____ .

1. The gravitational effect of the moon on the earth
2. The atmospheric effect of the earth
3. The gravitational effect of venus on the earth
4. The gravitational effect of the sun on earth

Correct Option - **1**

Que. 64 Which one the followings materials cannot be used to make a lens?

1. Water
2. Clay
3. Plastic
4. Glass

Correct Option - **2**

Que. 65 Vector quantities have got _____ .

1. Direction
2. Magnitude
3. Both Magnitude and Direction
4. None of these

Correct Option - **3**

Power of a lens is the reciprocal of _____ .

Que. 66

1. Image distance
2. Its focal length
3. None of these
4. Object distance

Correct Option - **2**

Que. 67 In transformer core is made or soft iron to reduce_____.

1. Force opposing electric current
2. Eddy current losses
3. None of these
4. Hysteresis losses

Correct Option - **4**

Que. 68 The height above the Earth surface of two bodies having similar masses is in the ratio 2:1. The ratio of their potential energy will be _____?

1. 4:1
2. 1:2
3. 1:1
4. 2:1

Correct Option - **4**

Que. 69 An artificial satellite orbiting the earth does not fall down because the earth's attraction _____?

1. Vanishes at such distances
2. Is balanced by the viscous drag produced by the atmosphere
3. Produces the necessary acceleration of its motion in a curved path
4. Is balanced by the attraction of the moon

Correct Option - **3**

Que. 70 Potential difference between two points of a wire carrying 2 ampere current is 0.1 volt. The resistance of the wire is:-

1. 0.5 ohm
2. 0.05 ohm
3. 0.25 ohm
4. 5 ohm

Correct Option - **2**

The bodies which are moving around the planets are called _____?

Que. 71
1. Asteroid
2. Meteorite
3. Galaxy
4. Satellite

Correct Option - **4**

Que. 72 Why does a stick partly immersed in water appear to be broken at the junction of water and air?

1. Scattering of light
2. Refraction of light
3. None
4. Reflection of light

Correct Option - **2**

Que. 73 An electric bulb is connected to a 220V generator. The current is 0.50A, what is the power of the bulb?

1. 130 W
2. 120 W
3. 110 W
4. 115.5 W

Correct Option - **3**

Que. 74 Which instrument is used for atmospheric pressure?

1. Gravimeter
2. Barometer
3. Altimeter
4. Calorimeter

Correct Option - **2**

Que. 75 A fuse is fixed in a circuit in order to _____.

1. Increase the power in the circuit
2. Decrease the amount of current
3. Safeguard against excessive current
4. Increase the amount of current

Correct Option - **3**

Que. 76 During radiation _____ has the maximum penetration power.

1. Beta ray

2. Cosmic ray

3. Alpha ray

4. Gamma ray

Correct Option - **4**

Que. 77 | Which of the following is used to make polythene?

1. Methane

2. Ethane

3. Acytlyene

4. Ethylene

Correct Option - **4**

Que. 78 | During day time, plants absorb _____ gas.

1. O_2

2. N_2

3. CO

4. CO_2

Correct Option - **4**

Que. 79 | What is the equation molarity

1. $M = n\ V$

2. $M = V / n$

3. $M = n / V$

4. $N = m / V$

Correct Option - **3**

Que. 80 | Ne is the chemical symbol of _____.

1. Xenon

2. Neon

3. Nickle

4. Nitrogen

Correct Option - **2**

Que. 81 | What is the property of a Neutral substance?

1. These substances do not change the colour of litmus paper

2. None of these

3. They are slightly acidic or slightly basic in solution

4. All are correct

Correct Option **- 1**

Que. 82 Which gas is used to make Nitrolium?

1. CI2
2. SO2
3. NH3
4. N2

Correct Option **- 4**

Que. 83 Charle's law is represented by which of the following?

1. V=T
2. V α T
3. V α 1/T 3
4. V α 1/T

Correct Option **- 2**

Que. 84 Which of the following medicine is extracted out of organisms?

1. Digitoxin
2. Kaolin
3. Antitoxin
4. Atropin

Correct Option **- 1**

Que. 85 Soaps are made by reacting fats with _____?

1. Potassium
2. Hydroxide
3. Calcium
4. Sodium

Correct Option **- 4**

Que. 86 What is the oxidation number of Fe in K4 Fe (CN)6

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

Correct Option - **3**

Que. 87 | Chemical formula of cryolite is ....?

1. CaF2
2. NaF
3. AIF3
4. Na3AIF6

Correct Option - **4**

Que. 88 | What is the chemical formula of Alum commonly used to stop bleeding?

1. Na2CO3, H2O
2. NaCl
3. KAl(SO4)2, 12 H2O
4. Na2CO3

Correct Option - **3**

Que. 89 | _____ is also known as laughing gas.

1. Nitrogen trioxide
2. Nitrogen pentaoxide
3. Ntrous oxide
4. Nitric oxide

Correct Option - **3**

Que. 90 | By which of the following reason layers of carbon atoms in graphite are held together?

1. Coordinate covalent bond
2. van der Waals forces
3. Covalent bonds
4. Double bonds

Correct Option - **2**

Que. 91 | What is the chemical formula of Gypsum

1. MgSO4, 7H2O
2. Na2SO4, 18H2O
3. Ca SO4, 1/2 H2O
4. CaSO4, 2H2O

Correct Option - **4**

Que. 92 The process in which oxidation number decreases is?

1. Hydrolysis
2. Reduction
3. Diffusion
4. Oxidation

Correct Option - **2**

Que. 93 Aluminum bronze is an alloy of _____.

1. Aluminium and Silver
2. Aluminium and Zinc
3. Aluminium and Copper
4. Aluminium and Tin"

Correct Option - **3**

Que. 94 Elements having same atomic mass number and different atomic numbers are called _____.

1. Isobar
2. isotonic
3. Isotopes
4. None of these

Correct Option - **1**

Que. 95 Lithium shows diagonal relationship with _____.

1. Aluminium
2. Boran
3. Beryllium
4. Magnesium

Correct Option - **4**

Que. 96 Oxidation of number of 'S' in H2SO4 is

1. +4
2. +6
3. 0
4. +2

Correct Option - **2**

Que. 97 One a.m.u. is equal to _____ grams.

1. None of these
2. 1.6x10-29
3. 1.6x10-30
4. 1.660x10-24

Correct Option - **4**

Que. 98 | Which element exists in liquid state at room temperature?

1. Au
2. Na
3. Mg
4. Br

Correct Option - **4**

Que. 99 | What is the molar heat capacity of water?

1. 75.3 Joule per mol-Kelvin
2. 185 Joule per mol-Kelvin
3. 4.184 Joule per mol-Kelvin
4. 1 Joule per mol-Kelvin

Correct Option - **1**

Que. 100 | Which gas makes sulphurus acid when mixed with water

1. PH_3
2. SO_2
3. H_2S
4. N_2

Correct Option - **2**