

The integrating factor of the differential equation  $(y \log y) dx = (\log y - x) dy$  is

☐  $1 + \log y$

☐  $\frac{1}{\log y}$

☐  $\log y$

☐  $\log(\log y)$

If the roots of the equation  $x^n - 1 = 0$  are  $1, a_1, a_2, \dots, a_{n-1}$ , then the value of  $(1 - a_1)(1 - a_2) \cdots (1 - a_{n-1})$  is

☐  $n^n$

☐  $n$

☐  $n^2$

☐ 0

## Question No.3

4.00

Bookmark ☐

The set of all  $2 \times 2$  matrices with real elements along with matrix addition

- ☐ form a semi group
- ☐ form a group
- ☐ form an abelian group
- ☐ form a monoid

## Question No.4

4.00

Bookmark ☐

A two digit number is three times the sum of its digits. If 45 is added to it, the digits are reversed. The number is

- ☐ 35
- ☐ 31
- ☐ 32
- ☐ 27

## Question No.5

4.00

Bookmark ☐

If in a certain language, GRASP is coded as BMVNK, which word would be coded as CRANE?

- ☐ HWFSJ
- ☐ XNVIZ
- ☐ FUDQH
- ☐ BQZMD

## Question No.6

4.00

Bookmark ☐

The solution of the differential equation is  $\frac{dy}{dx} + \frac{y}{x} = \log x$  is

- ☐  $yx = \frac{x^2}{2} (\log x) - \frac{x^2}{4} + c$
- ☐  $x = \frac{x^2}{2} (\log x) + \frac{x^2}{4} + c$
- ☐  $yx = \frac{x^2}{2} (\log x) + c$
- ☐  $yx = \frac{x}{2} (\log x) - \frac{x^2}{4} + c$

## Question No.7

4.00

Bookmark ☐

Choose the correct meaning of the italicized idiom.

You cannot throw *dust into my eyes*.

- ☐ Hurt me
- ☐ Abuse me
- ☐ Terrify me
- ☐ Cheat me

## Question No.8

4.00

Bookmark ☐

The number of distinct real values of  $\lambda$ , for which the vectors  $-\lambda^2 \hat{i} + \hat{j} + \hat{k}$ ,  $\hat{i} - \lambda^2 \hat{j} + \hat{k}$  and  $\hat{i} + \hat{j} - \lambda^2 \hat{k}$  are coplanar, is

- ☐  $\sqrt{2}$
- ☐ 0
- ☐  $\sqrt{3}$
- ☐ 1

## Question No.9

4.00

Bookmark ☐

In the interval  $(-3, 3)$ , the function  $f(x) = \frac{x}{x^2 + 3}$ ,  $x \neq 0$  is

- ☐ increasing
- ☐ neither increasing nor decreasing
- ☐ partly increasing and partly decreasing
- ☐ decreasing

Question No.10

4.00

Bookmark ☐

The value of  $x$  in  $\log_{\cos x} \sin x + \log_{\sin x} \cos x = 2$  is

- ☐  $2n\pi + \frac{\pi}{4}$
- ☐  $2n\pi + \frac{\pi}{3}$
- ☐  $2n\pi + \frac{\pi}{6}$
- ☐  $2n\pi + \frac{\pi}{2}$

Question No.11

4.00

Bookmark ☐

The value of  $\int_{-20\pi}^{20\pi} |\cos x| dx$  is

- ☐ 80
- ☐ 0
- ☐ 20
- ☐ 40

Question No.12

4.00

Bookmark ☐

If every element of a group  $G$  is its own inverse, then  $G$  is

- ☐ finite
- ☐ cyclic
- ☐ infinite
- ☐ abelian

Question No.13

4.00

Bookmark ☐

$\int_0^{\frac{\pi}{2}} \frac{\cos x - \sin x}{1 + \cos x \sin x} dx$  is equal to

- ☐  $\frac{\pi}{2}$
- ☐ 0
- ☐  $\frac{\pi}{6}$
- ☐  $\frac{\pi}{4}$

Question No.14

4.00

Bookmark ☐

If  $\alpha, \beta$  are the roots of the equation  $x^2 - 2x + 4 = 0$ , then the value of  $\alpha^6 + \beta^6$

If  $\alpha, \rho$  are the roots of the equation  $x^2 - 2x + 4 = 0$ , then the value of  $\alpha^4 + \rho^4$  is

- ☐ 256
- ☐ 64
- ☐ 32
- ☐ 128

Question No.15

4.00

Bookmark ☐

Every bounded infinite set of  $\mathbb{R}$  has

- ☐ at most one limit point in  $\mathbb{R}$
- ☐ finite closure
- ☐ at least one limit point in  $\mathbb{R}$
- ☐ no limit point in  $\mathbb{R}$

Question No.16

4.00

Bookmark ☐

If  $v = (x^2 + y^2 + z^2)^{-1/2}$ , then  $\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} + \frac{\partial^2 v}{\partial z^2}$  is equal to

- ☐ 1
- ☐ 0
- ☐ -1
- ☐ 2

Question No.17

4.00

Bookmark ☐

If  $u = x + y + z$ ;  $v = x^2 + y^2 + z^2$ ;  $w = yz + zx + xy$ , then  $(\text{grad } u)(\text{grad } v \times \text{grad } w)$  is equal to

- ☐ 2
- ☐ 0
- ☐ 1
- ☐ -1

Question No.18

4.00

Bookmark ☐

Which number replaces the question mark?



- ☐ 10
- ☐ 9
- ☐ 11
- ☐ 12

Question No.19

4.00

Bookmark ☐

Study the following information carefully and answer the question below it

- (i) There is a group of five persons- A, B, C, D and E
- (ii) One of them is manual scavenger, one is sweeper, one is watchman, one is human scarecrow and one is grave-digger
- (iii) Three of them - A, C and grave-digger prefer tea to coffee and two of them - B and the watchman prefer coffee to tea
- (iv) The human scarecrow and D and A are friends to one another but two of these prefer coffee to tea.
- (v) The manual scavenger is C's brother

Who is a manual scavenger?

Who is a manual scavenger :

- ☐ A
- ☐ B
- ☐ C
- ☐ D

Question No.20

4.00

Bookmark ☐

Choose the best antonym of the italicized word.

There are four chapters that are *extraneous* to the structure of the book.

- ☐ important
- ☐ relevant
- ☐ needful
- ☐ integral

Question No.21

4.00

Bookmark ☐

With respect to addition, the set  $\{0, 1, -1\}$  does NOT form a group, since it fails to satisfy

- ☐ associativity
- ☐ closure
- ☐ existence of identity
- ☐ existence of inverse

Question No.22

4.00

Bookmark ☐

The differential equation of all non-vertical lines in a plane is

- ☐  $\frac{dx}{dy} = 0$
- ☐  $\frac{d^2y}{dx^2} = 0$
- ☐  $\frac{d^2x}{dy^2} = 0$
- ☐  $\frac{dy}{dx} = 0$

Question No.23

4.00

Bookmark ☐

If  $x^2 - 1$  is a factor of  $x^4 + ax^3 + 3x - b$ , then

- ☐  $a = 3, b = 1$
- ☐  $a = -3, b = 1$
- ☐  $a = -3, b = -1$
- ☐  $a = 3, b = -1$

Question No.24

4.00

Bookmark ☐

$\int (\log x)^2 dx$  is equal to

- ☐  $x(\log x)^2 + c$

- $x(\log x)^2 + cx$
- $x(\log x)^2 - 2[x \log x - x] + c$
- $x(\log x)^2 + x \log x + c$

Question No.25

4.00

Bookmark ☐

The value of determinant  $\begin{bmatrix} 1 & 1 & 1 \\ e & \pi & \sqrt{2} \\ 2 & 2 & 2 \end{bmatrix}$  is equal to

◦  $\pi$

◦ e

◦

$2(e - \pi + \sqrt{2})$

◦ 0

Question No.26

4.00

Bookmark ☐

If  $A = \begin{bmatrix} \cos^2 \alpha & \cos \alpha \sin \alpha \\ \cos \alpha \sin \alpha & \sin^2 \alpha \end{bmatrix}$  and  $B = \begin{bmatrix} \cos^2 \beta & \cos \beta \sin \beta \\ \cos \beta \sin \alpha & \sin^2 \beta \end{bmatrix}$  are two matrices such that  $AB$  is null matrix, then  $\alpha - \beta$  is

☐ an even multiple of  $\frac{\pi}{2}$

☐ an odd multiple of  $\pi$

☐  $\alpha = \beta$

☐ 0

Question No.27

4.00

Bookmark ☐

The angle between the planes  $2x - y + z = 6$  and  $x + y + 2z = 3$  is

☐  $\frac{\pi}{6}$

☐  $\frac{\pi}{2}$

☐  $\frac{\pi}{3}$

☐  $\frac{\pi}{4}$

Question No.28

4.00

Bookmark ☐

The complex numbers  $z_1 = 1 + 2i$ ,  $z_2 = 4 - 2i$  and  $z_3 = 1 - 6i$  form the vertices of a

- ☐ scalene triangle
- ☐ right angled triangle
- ☐ equilateral triangle
- ☐ isosceles triangle

Question No.29

4.00

Bookmark ☐

The total number of terms in the expansion of  $(x + y)^{100} + (x - y)^{100}$  after simplification is

- ☐ 51
- ☐ 100
- ☐ 50
- ☐ 202

Question No.30

4.00

Bookmark ☐

Two finite sets  $X$  and  $Y$  have  $p$  and  $q$  elements respectively. If the total number of subsets of  $X$  is 56 more than the total number of subsets of  $Y$ . Then the value of  $q$  is

- ☐ 2
- ☐ 6
- ☐ 28
- ☐ 3

Question No.31

4.00

Bookmark ☐

Choose the best synonym of the italicized word. The prisoners of war signed the document under *coercion*.

- ☐ supervision
- ☐ compulsion
- ☐ confusion
- ☐ security

Question No.32

4.00

Bookmark ☐

The value of  $\lim_{x \rightarrow 2} \frac{e^{3x-6}-1}{\sin(2-x)}$  is equal to

- ☐ 3/2
- ☐ -1
- ☐ -3
- ☐ 3

Question No.33

4.00

Bookmark ☐

The order of the differential equation whose solution is  $y = a \cos x + b \sin x + ce^{-x}$  is

- ☐ 3
- ☐ 2
- ☐ 1
- ☐ 4

Question No.34

4.00

Bookmark ☐

If  $\vec{a}, \vec{b}, \vec{c}$  are three non-coplanar mutually perpendicular unit vectors, then  $[\vec{a} \ \vec{b} \ \vec{c}]$  is

- ☐ 1
- ☐ 2
- ☐ 0
- ☐ 3

Question No.35

4.00

Bookmark ☐

If  $y = \int x^3 \underline{\hspace{1cm}} dt$  then  $\underline{\hspace{1cm}} dy$  is



11.  $y = \int \frac{1}{1+t^4} dt$  then  $\frac{dy}{dx}$  is

- ☐  $\frac{3x^3}{1+2x^{12}}$
- ☐  $\frac{x^2}{1+x^{12}}$
- ☐  $\frac{x^4}{1+x^8}$
- ☐  $\frac{3x^2}{1+x^{12}}$

Question No.36

4.00

Bookmark ☐

Based on the information given answer the following question.

1. In a family of six persons, there are people from three generations. Each has separate professions and they like different colours. There are two couples.
2. Shyam is an Engineer and his wife is not a doctor and she does not like Red colour.
3. Chartered Accountant likes green colour and his wife is a teacher.
4. Manisha is the mother-in-law of Sunita and she likes orange colour.
5. Vimal is the grand father of Tarun and tarun is the Principal and likes black colour.
6. Nyna is the grand daughter of Manisha and she likes blue colour. Nyna's Mother likes white colour.

Which of the following is the correct pair of two couples?

- ☐ Shyam-Sunita, Vimal-Manisha
- ☐ Tarun-Nyna, Shyam-Sunita
- ☐ Shyam-Manisha, Vimal-Sunita
- ☐ Cannot be determined

Question No.37

4.00

Bookmark ☐

Study the following information carefully and answer the question below it:

Aasha, Bhuvnesh, Charan, Danesh, Ekta, Farhan, Ganesh and Himesh are sitting around a circle, facing the centre. Aasha sits fourth to the right of Himesh while second to the left of Farhan. Charan is not the neighbour of Farhan and Bhuvnesh. Danesh sits third to the right of Charan. Himesh never sits next to Ganesh.

Who among the following sits between Ganesh and Danesh?

- ☐ Aasha
- ☐ Charan
- ☐ Ekta
- ☐ Bhuvnesh

Question No.38

4.00

Bookmark ☐

Sum of the series  $\frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \dots$  is

- ☐  $\log 2$
- ☐ 0
- ☐  $e^{-1}$
- ☐  $\sqrt{e}$

Question No.39

4.00

Bookmark ☐

The set  $\{z \in \mathbb{C} : 1 < |z| < 2\}$  is

- ☐ connected
- ☐ closed
- ☐ compact
- ☐ convex

Question No.40

4.00

Bookmark ☐

The set  $A = \{x \in \mathbb{R} : |x-1| + |x-2| < 3\}$  is

- ☐ neither open nor closed
- ☐ open
- ☐ closed
- ☐ open and closed

## Question No.41

4.00

Bookmark ☐

The value of  $\Delta \tan^{-1} x$  is

- ☐  $\tan^{-1}\left(\frac{x^2}{1-hx}\right)$
- ☐  $\tan^{-1}\left(\frac{x^2}{1+hx}\right)$
- ☐  $\tan^{-1}\left(\frac{h}{1+hx+x^2}\right)$
- ☐  $\tan^{-1}\left(\frac{h}{1-hx-x^2}\right)$

## Question No.42

4.00

Bookmark ☐

Choose the missing term : AZ, GT, MN, ?, YB

- ☐ SH
- ☐ TS
- ☐ KE
- ☐ SX

## Question No.43

4.00

Bookmark ☐

If A+B means A is daughter of B,  
A-B means A is husband of B  
A × B means A is brother of B

From the statement P – Q + R × S, how is Q related to S?

- ☐ Niece
- ☐ Sister
- ☐ Mother
- ☐ None of these

## Question No.44

4.00

Bookmark ☐

Under addition, which one of the following statements is true ?

- ☐  $2Z$  is a cyclic subgroup of  $Z$
- ☐  $2Z$  is a subgroup of  $Z$  but not cyclic
- ☐  $Z$  is a cyclic subgroup of  $2Z$
- ☐  $Z$  is a subgroup of  $2Z$

## Question No.45

4.00

Bookmark ☐

If  $\vec{a} = 2\hat{i} + 3\hat{j} + \hat{k}$ ,  $\vec{b} = 2\hat{i} - p\hat{j} + 3\hat{k}$  and  $\vec{c} = 2\hat{i} + 17\hat{j} - 3\hat{k}$  are coplanar, then the value of  $p$  is

- ☐ -4
- ☐ 4
- ☐ -1
- ☐ -2

## Question No.46

4.00

If  $\vec{a} + \vec{b} + \vec{c} = 0$  and  $|\vec{a}| = 3, |\vec{b}| = 4$  and  $|\vec{c}| = \sqrt{37}$ , then the angle between  $\vec{a}$  and  $\vec{b}$  is

- ☐  $\frac{\pi}{3}$
- ☐  $\frac{\pi}{4}$
- ☐  $\frac{\pi}{6}$
- ☐  $\frac{\pi}{2}$

Question No.47

4.00

Bookmark ☐

The value of  $\int_0^{\frac{\pi}{2}} \frac{dx}{(\sqrt{\cos x} + \sqrt{\sin x})^4}$  is

- ☐ 3/4
- ☐ 1/3
- ☐ 1/2
- ☐ 2

Question No.48

4.00

Bookmark ☐

If  $f$  is analytic and  $f'(z) \neq 0$ , then

- ☐  $f$  is a constant function
- ☐  $f$  is a non-conformal mapping
- ☐  $f$  is the identity function
- ☐  $f$  is a conformal mapping

If  $\sec^{-1}\left(\frac{1+x}{1-y}\right) = a$ , then  $\frac{dy}{dx}$  is

☐  $\frac{x-1}{y+1}$

☐  $\frac{y+1}{x-1}$

☐  $\frac{y-1}{x+1}$

☐  $\frac{x-1}{y-1}$

The value of  $\left(\frac{\Delta^2}{E}\right) e^x \frac{E e^x}{\Delta^2 e^x}$  is

☐  $e^x$

☐  $1 + e^x$

☐  $\frac{1}{e^x}$

☐  $e^{-x}$

These boys need some new books, \_\_\_\_\_?

☐ don't they?

☐ is it?

☐ isn't it?

☐ do they?

Question No.52

4.00

Bookmark ☐

The angle between the planes  $2x - y + z = 6$ ,  $x + y + 2z = 3$  is

- ☐  $\frac{\pi}{2}$
- ☐  $\frac{\pi}{4}$
- ☐  $\frac{\pi}{6}$
- ☐  $\frac{\pi}{3}$

Question No.53

4.00

Bookmark ☐

If the coefficient of  $x^2$  and  $x^3$  in the expansion of  $(3 + kx)^9$  are equal, then the value of  $k$  is

- ☐  $-9/7$
- ☐  $9/7$
- ☐  $-7/9$
- ☐  $7/9$

Question No.54

4.00

Bookmark ☐

The value of  $\nabla \times \nabla \phi$  is

- ☐ -1
- ☐ 2
- ☐ 1
- ☐ 0

Question No.55

4.00

Bookmark ☐

If probability of a defective bolt is 0.1, then mean and standard deviation of distribution of bolts in a total of 400 are

- ☐ 30, 3
- ☐ 40, 6
- ☐ 30, 4
- ☐ 40, 5

Question No.56

4.00

Bookmark ☐

If  $e^{\frac{dy}{dx}} = x + 1$ , then  $y$  is equal to

- ☐  $x \log(x + 1) + x + \log(x + 1) + c$
- ☐  $x \log(x + 1) + c$
- ☐  $x \log(x + 1) - x + \log(x + 1) + c$
- ☐  $-x + \log(x + 1) + c$

Question No.57

4.00

Bookmark ☐

The solution of the differential equation  $(2x \log y) dx + \left(\frac{x^2}{y} + 3y^2\right) dy = 0$  is

- ☐  $x^2 (\log y) + y^2 + c$
- ☐  $x (\log y) - y^2 + c$
- ☐  $x^2 (\log y) + y^3 + c$
- ☐  $x^2 (\log y) - y^2 + c$

Question No.58

4.00

Bookmark ☐

The solution of the differential equation  $ydx - xdy + xy^2dx = 0$  is

- ☐  $\frac{x}{y} + \frac{x^2}{2} = \lambda$
- ☐  $2x + x^2 = \lambda$

$$\frac{1}{y^2} + \frac{1}{4} = \lambda$$

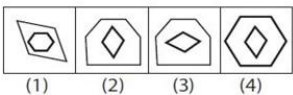
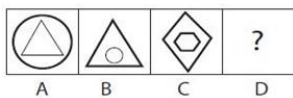
$$\circ \frac{x}{y} + x^2 = \lambda$$

$$\circ \frac{x}{2y^2} + \frac{x^2}{4} = \lambda$$

Question No.59

4.00

Bookmark ☐



- ☐ 2
- ☐ 4
- ☐ 3
- ☐ 1

Question No.60

4.00

Bookmark ☐

Find the value of  $\sum_{r=2}^{43} \frac{1}{\log_r n}$  is

$$\circ \log_n(43)!$$

☐ 1

$$\circ (43)!$$

$$\circ \log_r 43!$$

Question No.61

4.00

Bookmark ☐

The locus of the centers of the circles which touch both the axes is given by

$$\circ x^2 - y^2 = 1$$

$$\circ x^2 + y^2 = 1$$

$$\circ x^2 + y^2 = 0$$

$$\circ x^2 - y^2 = 0$$

Question No.62

4.00

Bookmark ☐

If the length of the pendulum is increased in the ratio 900 : 901, then the seconds, a clock would lose per day, is

- ☐ 5 seconds
- ☐ 2 seconds
- ☐ 1 second
- ☐ 4 seconds

Question No.63

4.00

Bookmark ☐

Choose the best antonym of the italicized word.  
Many snakes are actually *innocuous*.

- ☐ harmful
- ☐ deadly
- ☐ poisonous
- ☐ ferocious

Question No.64

4.00

Bookmark ☐

The set of congruent 8 classes  $\{[1], [3], [5], [7]\}$  under multiplication modulo 8 forms

- ☐ a cyclic group
- ☐ a monoid
- ☐ a semi group
- ☐ an abelian group

Question No.65

4.00

Bookmark ☐

The value of  $\int_0^{\frac{\pi}{6}} \cos^4 3\theta \sin^3 6\theta \, d\theta$  is

- ☐ 1/6
- ☐ 2/5
- ☐ 1/15
- ☐ 1/3

Question No.66

4.00

Bookmark ☐

The value of  $\lim_{n \rightarrow \infty} n^{1/n}$  is equal to

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ -1

Question No.67

4.00

Bookmark ☐

The coefficient of  $x^6$  in  $\{(1+x)^6 + (1+x)^7 + \dots + (1+x)^{15}\}$  is

- ☐  ${}^{16}C_6 - 1$
- ☐  ${}^{16}C_9$
- ☐  ${}^{16}C_5 - {}^6C_5$
- ☐  ${}^{16}C_6 - {}^6C_5$



Question No.68

4.00

Bookmark ☐

If the point P(4,3) is shifted by a distance  $\sqrt{2}$  unit parallel to the line  $y = x$ , then the coordinates of P in new position is

☐ (5,4)

☐  $(5 - \sqrt{2}, 4 - \sqrt{2})$

☐ (-5, -4)

☐  $(5 + \sqrt{2}, 4 + \sqrt{2})$

Question No.69

4.00

Bookmark ☐

The middle term in the expansion of  $(x - \frac{1}{x})^{18}$  is

☐

$-^{18}C_9$

☐

$^9C_1$

☐

$^{18}C_9$

☐

$-^{18}C_{10}$

Question No.70

4.00

Bookmark ☐

If a function  $f(z)$  is continuous at  $z_0$ , then

☐ $f(z)$  is differentiable at  $z_0$ ☐ $f(z)$  is analytic at  $z_0$ ☐ $f(z)$  need not be differentiable at  $z_0$ ☐ $f'(z)$  is continuous

Question No.71

4.00

Bookmark ☐

$\int \frac{(x^3 + 3x^2 + 3x + 1)}{(x + 1)^5} dx$  is equal to

☐

$-\frac{2}{x+1} + c$

$$x+1$$

- ☐  $\frac{1}{x^2+1} + C$
- ☐  $\frac{2}{x^2+1} + C$
- ☐  $-\frac{1}{x+1} + C$

Question No.72

4.00

Bookmark ☐

A square ABCD of diagonal  $2a$  is folded along the diagonal AC so that the planes DAC, BAC are at right angles. The shortest distance between DC and AB is

- ☐  $\frac{a}{2\sqrt{3}}$
- ☐  $\frac{a}{\sqrt{3}}$
- ☐  $\frac{2a}{\sqrt{3}}$
- ☐  $\frac{a^2}{\sqrt{3}}$

Question No.73

4.00

Bookmark ☐

Choose the correct meaning of the italicized idiom.  
Those who work by *fits and start* seldom show good results.

- ☐ Regularly
- ☐ Rarely
- ☐ Irregularly
- ☐ Disinterestedly

Question No.74

4.00

Bookmark ☐

If  $f(x) = 2x^3 + 9x^2 + \lambda x + 20$  is a decreasing function of  $x$  in the largest possible interval  $(-2, -1)$ , then  $\lambda$  is equal to

- ☐ 6
- ☐ 12
- ☐ -6
- ☐ -12

Question No.75

4.00

Bookmark ☐

The angle between the lines  $\frac{x-6}{2} = \frac{y-2}{1} = \frac{z+4}{-1}$  and  $x + 5y - 2z - 6 = 0$  ;  $6x - 4y + 5z - 2 = 0$  is

- ☐  $\frac{\pi}{2}$
- ☐  $\frac{\pi}{6}$
- ☐  $\pi$

$$\frac{\pi}{3}$$

☐  $\frac{\pi}{4}$

Question No.76

4.00

Bookmark ☐

If a tangent plane to the sphere  $x^2 + y^2 + z^2 = r^2$  makes intercepts  $a, b, c$  on the coordinates axes, then

- ☐  $\frac{a^2}{b^2} + \frac{b^2}{c^2} + \frac{c^2}{a^2} = \frac{1}{r^2}$
- ☐  $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} = \frac{1}{r}$
- ☐  $a^2 + b^2 + c^2 = r^2$
- ☐  $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} = \frac{1}{r^2}$

Question No.77

4.00

Bookmark ☐

Since the \_\_\_\_\_ of the motor car, road accidents have increased dramatically.

- ☐ inauguration
- ☐ inception
- ☐ advent
- ☐ initiation

Question No.78

4.00

Bookmark ☐

An urn contains 3 red and 5 blue balls. The probability that two balls are drawn in which 2nd ball drawn is blue without replacement is

- ☐ 5/8
- ☐ 5/16
- ☐ 5/56
- ☐ 20/56

Question No.79

4.00

Bookmark ☐

In recent times, the number of cases of death by poisoning \_\_\_\_\_ sharply.

- ☐ increased
- ☐ has increased
- ☐ had increased
- ☐ have increased

Question No.80

4.00

Bookmark ☐

The set  $A = \{m + n\sqrt{2} : m, n \in \mathbb{Z}\}$

- ☐ has irrational limit points
- ☐ has no limit point
- ☐ is dense in  $\mathbb{R}$
- ☐ has rational limit points

Question No.81

4.00

Bookmark ☐

$\int_{-2}^2 |[x]| dx$  is equal to

- ☐ 0
- ☐ 2
- ☐ 4
- ☐ 1

Question No.82

4.00

Bookmark ☐

The equation of the normal to the curve  $y = \sin x$  at  $(0, 0)$  is

- ☐  $x - y = 0$
- ☐  $x + y = 0$
- ☐  $x = 0$
- ☐  $y = 0$

Question No.83

4.00

Bookmark ☐

Let  $f(z) = |z|^2$  for  $z \in \mathbb{C}$ . Then

- ☐  $f$  is continuous at 0 but is not differentiable at 0
- ☐  $f$  is analytic at 0
- ☐  $f$  is differentiable at 0 but is not analytic at 0
- ☐  $f$  is not continuous at 0

Question No.84

4.00

Bookmark ☐

The direction cosines of the line joining the points  $(3, -5, 4)$  and  $(1, -8, -2)$  are

- ☐  $-\frac{2}{7}, -\frac{3}{7}, -\frac{6}{7}$
- ☐  $\frac{2}{5}, \frac{3}{5}, \frac{6}{5}$
- ☐  $-\frac{2}{5}, -\frac{3}{5}, -\frac{6}{5}$
- ☐  $\frac{2}{7}, \frac{3}{7}, \frac{6}{7}$

Question No.85

4.00

Bookmark ☐

The solution set of the equation 
$$\begin{bmatrix} 2 & 3 & x \\ 2 & 1 & x^2 \\ 6 & 7 & 3 \end{bmatrix} = 0$$
 is

☐ {1,-1}

☐

☐ {0, 1}

☐ {1,-3}

Question No.86

4.00

Bookmark ☐

**Statement:** "A Car is required on rent"-An Advertisement

**Assumptions:**

I. All types of Vehicles are available on Rent

II. People will respond to the advertisements

- ☐ If neither I nor II is implicit
- ☐ If both I and II are implicit
- ☐ If only assumption I is implicit
- ☐ If only assumption II is implicit

Question No.87

4.00

Bookmark ☐

The probability that a man will live 10 more years, is  $\frac{3}{5}$  and the probability that his wife will live 10 more years, is  $\frac{2}{7}$ . Then the probability that none of them will be alive after 10 years is

☐ 2/5

- ☐ 3/5
- ☐ 2/7
- ☐ 5/7

Question No.88

4.00

Bookmark ☐

The product of all values of  $(\cos \alpha + i \sin \alpha)^{\frac{3}{5}}$  is

☐ 1

☐  $\cos 5\alpha + i \sin 5\alpha$

☐  $\cos \alpha + i \sin \alpha$

☐  $\cos 3\alpha + i \sin 3\alpha$

Question No.89

4.00

Bookmark ☐

The system of linear equations

$$x_1 + 2x_2 + x_3 = 3$$

$$2x_1 + 3x_2 + x_3 = 3$$

$$3x_1 + 5x_2 + 2x_3 = 1 \text{ has}$$

- ☐ exactly 3 solutions
- ☐ infinite number of solutions
- ☐ a unique solution
- ☐ no solution

Question No.90

4.00

Bookmark ☐

The sequence  $\{\sqrt{n+1} - \sqrt{n}\}$  converges to

- ☐ 1
- ☐ 1/2
- ☐ -1
- ☐ 0

Question No.91

4.00

Bookmark ☐

A fair die is rolled until a number greater than 4 appears. The probability that an even number of rolls shall be required, is

- ☐ 3/5
- ☐ 1/2
- ☐ 2/3

Question No.92

4.00

Bookmark ☐

If  $x^y y^x = 100$ , then  $\frac{dy}{dx}$  is equal to

- ☐  $-\frac{y}{x}$
- ☐  $-\frac{y(y+x \log y)}{x(y \log x+x)}$
- ☐  $-\frac{y(x+y) \log x}{x(x \log y+y)}$
- ☐  $-\frac{x}{y}$

Question No.93

4.00

Bookmark ☐

**Statements:** All tools are books, Some books are pens.

**Conclusion:**

- I. Some tools are pen
- II. Some pens are books
- ☐ If only conclusion I follows
- ☐ If either I or II follows
- ☐ If neither I nor II follows
- ☐ If only conclusion II follows

Question No.94

4.00

Bookmark ☐

If  $\alpha, \beta, \gamma$  are roots of the equation  $X^3 + 64 = 0$ , then equation whose roots are  $(\frac{\alpha}{\beta})^2$  and  $(\frac{\alpha}{\gamma})^2$  is

- ☐  $x^2 + 4x + 16 = 0$
- ☐  $x^2 - 4x + 16 = 0$

- ☐  $x^2 + x + 1 = 0$
- ☐  $x^2 - x + 1 = 0$

Question No.95

4.00

Bookmark ☐

If the matrix  $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$  is commutative with the matrix  $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ , then

- ☐  $d=0, a=b$
- ☐  $c=0, d=a$
- ☐  $a=0, b=c$
- ☐  $b=0, c=d$

Question No.96

4.00

Bookmark ☐

If  $|\vec{a}| = |\vec{b}| = |\vec{a} + \vec{b}| = 1$ , then  $|\vec{a} - \vec{b}|$  is equal to

- ☐  $\sqrt{3}$
- ☐  $\sqrt{2}$
- ☐ 1
- ☐ 2

Question No.97

4.00

Bookmark ☐

If  $x^x y^y z^z = c$ , then  $\frac{\partial z}{\partial x}$  is equal to

- ☐  $\frac{1+\log x}{1+\log z}$
- ☐  $-\frac{1+\log x}{1+\log z}$
- ☐  $\frac{1+\log z}{1+\log x}$
- ☐  $\frac{1-\log z}{1-\log x}$

Question No.98

4.00

Bookmark ☐

If 5 men or 8 boys can do a work in 84 days. In how many days can 10 men and 5 boys can do the same work?

- ☐ 32
- ☐ 28
- ☐ 35
- ☐ 25



The series  $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \dots \dots \dots \infty$  is a

- ☐ Oscillatory series
- ☐ Divergent but not Oscillatory
- ☐ Convergent series
- ☐ Divergent series

The line  $\frac{x-1}{2} = \frac{y-3}{3} = \frac{z-4}{-1}$  is parallel to the plane

- ☐  $x + 2y + 4z + 7 = 0$
- ☐  $x - 2y - 4z + 7 = 0$
- ☐  $x - 2y + 4z - 7 = 0$
- ☐  $x + 2y + 4z - 7 = 0$