Section-I: General Ability

1. If $I_{MHO} = J_{NIP}$, $I_{DK} = J_{EL}$ and $S_O = T_P$ then I_{DC} = _____.

   (A) JDE (B) JDC (C) JCD (D) JED

2. Once the team of analyst indentify the problem we _____in a better position to comment on the issue.

   (A) might be (B) wore to be

   (C) are going to be (D) will be

3. The product of three integers X, Y and Z is 192, Z equal to 4 and P is equal to average of X and Y. What is the minimum possible value of P.

   (A) 7 (B) 6 (C) 9, 5 (D) 8

4. A find examination is the _____of a series of evaluations that a student has to go through

   (A) insinuation (B) culmination

   (C) desperation (D) consultation

5. Are there enough seats here? There are _____ People here than I expected.

   (A) least (B) many (C) most (D) more

7. Two pipes P and Q can fill a tank in 6 hours and 9 hours respectively. While a third pipe R can empty the tank in 12 hours. Initially P and R are open for 4 hours. Then P is closed and Q is opened. After 6 more hours R is closed. The total time taken to fill the tank (in hours is)

   (A) 16.50 (B) 14.50 (C) 13.50 (D) 15.50

8. Mola is a digital platform for taxis in a city. If offers three type of rides, POD, Mint and Prime. The table below present the number of rides for the past four months. The platform earns one us dollar per ride. What is the percentage share of revenue contributed by prime to the total revenue of Mola for the entire duration.

Type	Month			
Pool minimum prime	January	February	March	April
	170	320	215	190
	110	220	180	70
	75	180	120	90

   (A) 16.24 (B) 23.97 (C) 25.86 (D) 38.74

9. Fiscal deflect was 40% of the GDP in 2015, and that increased to 5% in 2016. If the GDP increased be 10% from 2015 to 2016, the % increase in the actual fiscal deflect is

(A) 37.50 (B) 25.00 (C) 35.70 (D) 10.00

10. If x is the means of data 3, x, 2 and 4 then the mode is _____.

Section-II: Engineering Mathematics

11. The directional derivative of the function $f(x,y) = x^2 + y^2$ along a line directed from (0, 0) to (1, 1) evaluated at point x = 1, y = 1 is

(A) $4\sqrt{2}$ (B) $\sqrt{2}$ (C) $2\sqrt{2}$ (D) 2

17. In matrix equation $[A]\{x\} = \{R\}$

$$[A] = \begin{bmatrix} 4 & 8 & 4 \\ 8 & 16 & -4 \\ 4 & -4 & 15 \end{bmatrix}, \{x\} = \begin{bmatrix} 2 \\ 1 \\ 4 \end{bmatrix} \text{ and } R = \begin{bmatrix} 32 \\ 16 \\ 64 \end{bmatrix}$$

One of the eigen value of Matrix 'A' is

(A) 8 (B) –16 (C) 15 (D) 4

22. An analytic function f(2) of complex variable $z = x + iy$ may be written as

$f(2) = u(x,y) + iv(x,y)$ and $u(x,y), v(x,y)$ must satisfy.

(A) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$ and $\frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

(B) $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial y}$ and $\frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

(C) $\frac{\partial u}{\partial x} = \frac{-\partial v}{\partial y}$ and $\frac{\partial u}{\partial y} = \frac{-\partial v}{\partial x}$

(D) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$ and $\frac{\partial u}{\partial y} = \frac{-\partial v}{\partial x}$

24. The transformation matrix for mirroring a point in x–y plane about the line y= x is given by

(A) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$

25. The differential equation $\frac{dy}{dx}+4y=5$ is valid in the domain $0\le x\le 1$ with $y(0)=2.25$. The solution of Differential equation is

(A) $y=+e^{-4x}+1.25$ (B) $y=e^{4x}+1.25$

(B) $y=e^{-4x}+5$ (D) $y=e^{4x}+5$

27. Given a vector $u=\frac{1}{3}\left(-y^3i+x^3j+z^3k\right)$ and $\hat{n}$ as the normal unit vector of the surface of the hemisphere $\left(x^2+y^2+z^2=1;\ z=0\right)$ the value of integral $\int(\bar{v}\times u).\ \hat{n}\,ds$ evaluation on the curved surface of the hemisphere is

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) π (D) $\frac{-\pi}{2}$

28. The derivation of $f(x)=\cos x$ can be estimated using the approximation $f'(x)=\frac{f(x+h)-f(x-h)}{2h}$.

The % of error is calculated as $\left(\frac{\text{Exact value}-\text{Approx value}}{\text{Exact value}}\times 100\right)$. The percentage error in the derivative of f(n) at $x=\frac{\pi}{6}$ choosing h= 0.1 radian is

(A) $>5\%$ (B) $>0.1\%$ and $<1\%$

(C) $<0.1\%$ (D) $>1\%$ and $<5\%$

40. A differential equation is given as

$$\frac{x^2d^2y}{dx^2}-\frac{2xdy}{dx}+2y=4$$

The solution of differential equation in terms of arbitrary constant C_1 and C_2

(A) $y=C_1x^2+C_2x+4$ (B) $y=\frac{C_1}{x^2}+C_2x+4$

(C) $y=\frac{C_1}{x^2}+C_2x+2$ (D) $y=C_1x^2+C_2x+2$

51. The probability that a part manufactured by a company will be defective is 0.05. If 15 such parts are selected randomly and inspected, then the probability that at least two part will be deflective is _____.

Classification

Subject	1M	2M
General Ability	5	5
Engineering Mathematics	6	3
Engineering Mechanics	1	2
Strength of Materials	3	3
Design of Machine Elements	1	1
Theory of Machines	2	4
Vibrations	0	1
Fluid Mechanics	2	3
Heat Transfer	3	2
Thermal Science	2	3
Manufacturing Science	5	6
Industrial Engineering	0	2