AHUJA
CAREER INSTITUTE

Pre-GUJCET Exam : 2018

Test Booklet No.	0	0	4

This booklet contains [ ] pages.
DO NOT open this Test Booklet until you are asked to do so.

Important instructions:

1. The **MATHEMATICS** test is consist of **40** questions. Each question carries 1 mark .For each correct response the candidate will get **1** mark. For each incorrect response, ¼ mark will be deducted. The maximum marks are **40**.
2. The Test is of **1 hour** duration.
3. Use Black Ball point Pen only for writing on OMR answer sheet marking ● responses.
4. Rough work is to be done on the space provided for purpose in the Test booklet only.
5. **On completion of the test, the candidate must handover the Answer sheet to the invigilator in the Room/Hall . The candidates are allowed to take away this test booklet with them.**
6. The CODE for this booklet is **004**. Make sure that the **CODE** printed on the answer sheet is the same as that on this booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the test booklet and answer sheet.
7. The candidate should ensure that the answer sheet is nit folded. Do not make any stray marks on the answer sheet.
8. Do not write your seat No. anywhere else, except in the specified space in the test booklet/answer sheet.
9. Use of white fluid for correction is not permission on the answer sheet.
10. Each candidate must show , on demand his/her admission card to the invigilator
11. No candidate, without special permission of the superintendent or in invigilator, should leave his/her seat.
12. Use of manual calculator is permissible.
13. The candidate should not leave the examination Hall without handing over their answer sheet to the invigilator on duty and must sign the attendance sheet be deemed not to have handed over the answer sheet and dealt with as a unfair case.
14. The candidates are governed by all rules and regulations of the board with regard to their conduct in the regulation of the board .
15. No part of the Test Booklet and answer sheet shall be detached under any circumstance .
16. The candidates will write the correct Test Booklet code as given in the Test Booklet/Answer sheet in the attendance sheet.

Candidate's Name : ……

Exam. Seat No. (in figures) …… (in words) ……

Name of Exam. Centre : ……

Candidate's Sign…… Block Supt. Sign……

1. Bionary operation * defined as $A * B = A \cap B$ on $P(X)$ where $X \neq \phi$ then identity element of * is .....

(A) X (B) ϕ (C) $P(X)$ (D) does not exist

2. 4 letters are put in 4 covers randomly the probability that all 4 does not to right covers is ….

(a) $\frac{3}{4}$ (b) $\frac{1}{4}$ (c) $\frac{1}{24}$ (d) $\frac{23}{24}$

3. Three vertices of regular hexagon are randomly selected to from triangle probability that the triangle formed is equilateral is ……

(a) $\frac{1}{2}$ (b) $\frac{5}{6}$ (c) $\frac{1}{10}$ (d) $\frac{1}{20}$

4. The area of the parallelogram whose diagonals are $\hat{j}+\hat{k}$ and $\hat{i}+\hat{k}$ is …..

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{3}{2}$ (c) 3 (d) $\sqrt{3}$

5. ..... is meaningless.

(a) $\bar{a}\cdot(\bar{b}\times\bar{c})$ (b) $(\bar{a}\cdot\bar{b})\bar{c}$ (c) $\bar{a}\times(\bar{b}\cdot\bar{c})$ (d) $\bar{a}\times(\bar{b}\times\bar{c})$

6. Perpendicular distance of $\bar{r}\cdot(1,1,1)=3$ from point $(1,2,3)$ is …..

(a) 3 (b) $\sqrt{3}$ (c) 9 (d) 2

7. Perpendicular distance between the parallel planes $2x+2y-z+1=0$ and $2x+2y-z+4=0$ is ...

(a) 2 (b) 1 (c) 3 (d) 4

(Space for Rough Work)

8. If direction cosines of the normal of plane are $\frac{®}{4}, \frac{®}{4}$ and $\frac{®}{2}$ and its perpendicular distance from origin is $\sqrt{2}$ then what will be the equation of plane ?

(a) $x + y + \frac{z}{\sqrt{2}} = 2$ (b) $x + y + z = 2\sqrt{2}$ (c) $x + y = 2$ (d) $\sqrt{2}x + y + \sqrt{2}z = 2$

9. Let x and y be optimal solution of an L.P. problem then

(a) $z = ª x + (1 - ª) y, ª \in R$ is also an optimal solution

(b) $z = ª x + (1 - ª) y, 0 \le ª \le 1$ gives an optimal solution

(c) $z = ª x + (1 + ª) y, 0 \le ª \le 1$ gives an optimal solution

(d) $z = ª x + (1 + ª) y, ª \in R$ gives an optimal solution

10. The optimal value of the objective function is attained at the points

(a) given by intersection of lines representing inequations with axes only

(b) given by intersection of lines representing inequations with x-axis only

(c) given by corner points of the feasible region

(d) at the origin

(Space for Rough Work)

11. $\frac{d}{dx}\left\{\frac{\sum_{i=1}^{5} x^{i-1}}{\sum_{i=1}^{5} x^{-i+1}}\right\}_{X=2} = \ldots\ldots\ (x \in R^{+})$

(a) -32 (b) 16 (c) 32 (d) -16

12. If $y = \sin x$ then $y_n = \ldots\ldots$

(a) $\sin\left(\frac{n®}{2} + x\right)$ (b) $\sin(n® + x)$ (c) $\cos\left(\frac{n®}{2} + x\right)$ (d) $\cos(n® + x)$

13. If $y = 1 + \frac{1}{x} + \frac{1}{x^2} + \frac{1}{x^3} + \ldots\ldots \infty \ |x| > 1$ then $\frac{dy}{dx} = \ldots\ldots$

(a) $\frac{x^2}{y^2}$ (b) $x^2 y^2$ (c) $\frac{y^2}{x^2}$ (d) $\frac{-y^2}{x^2}$

14. If $f(x) = |x-2| + |x+1| - x$, then $f'(-10) = \ldots\ldots$

(a) -3 (b) -2 (c) -1 (d) 0

15. $\int (1 + x - x^{-1}) e^{x+x^{-1}} dx = \ldots\ldots$

(a) $(x+1)e^{x+x^{-1}} + c$ (b) $(x-1)e^{x+x^{-1}} + c$ (c) $-xe^{x+x^{-1}} + c$ (d) $xe^{x+x^{-1}} + c$

16. $\int \frac{dx}{1 + \tan x} = \ldots\ldots$

(a) $\frac{1}{2} + \frac{1}{2}\log|\cos x + \sin x| + C$ (b) $\frac{x}{2} + \frac{1}{2}\log|\cos x - \sin x| + C$

(c) $\frac{1}{2} + \frac{1}{2}\log|\cos x - \sin x| + C$ (d) $\frac{x}{2} + \frac{1}{2}\log|\cos x + \sin x| + C$

(Space for Rough Work)

17. $\int (x+1)(x+2)^7(x+3)dx = ...$

(a) $\frac{(x+2)^{10}}{10} - \frac{(x+2)^8}{8} + C$ (b) $\frac{(x+1)^2}{2} - \frac{(x+2)^8}{8} - \frac{(x+3)^2}{2} + C$

(c) $\frac{(x+2)^{10}}{10} + C$ (d) $\frac{(x+1)^2}{2} + \frac{(x+2)^8}{8} + \frac{(x+3)^2}{2} + C$

18. $\int \frac{dx}{(x-1)^{\frac{3}{2}} \times (x+3)^{\frac{1}{2}}} = ... + c$

(a) $-\sqrt{\frac{x+3}{x-1}}$ (b) $-\frac{1}{2}\sqrt{\frac{x-1}{x+3}}$ (c) $\frac{1}{2}\sqrt{\frac{x+3}{x-1}}$ (d) $-\frac{1}{2}\sqrt{\frac{x+3}{x-1}}$

19. $\int \frac{2^{\frac{1}{x}}}{x^2} dx = k \cdot 2^{\frac{1}{x}} + c$ then k = …….

(a) $-\frac{1}{\log 2}$ (b) $-\log 2$ (c) -1 (d) $\frac{1}{2}$

20. $\int e^x \left(\frac{x^2+5x+7}{(x+3)^2} \right) dx$

(a) $e^x \left(\frac{x+1}{x+2} \right) + c$ (b) $e^x \left(\frac{x+1}{x+3} \right) + c$ (c) $e^x \left(\frac{x-1}{x+3} \right) + c$ (d) $e^x \left(\frac{x+2}{x+3} \right) + c$

21. $\int_{-1}^{2} |2x-1| dx = ...$

(a) $\frac{9}{4}$ (b) $\frac{5}{2}$ (c) $\frac{13}{2}$ (d) $\frac{9}{2}$

(Space for Rough Work)

22. $\int_{-\frac{1}{2}}^{\frac{1}{2}} \cos x \log\left(\frac{1+x}{1-x}\right) dx = k \log 2$ then $k = ...$

(a) 0 (b) -1 (c) -2 (d) None

23. Area of region bounded by $|x| = 2$, X-axis and $y = 1$ is .....

(a) 2 (b) 3 (c) 4 (d) 5

24. Area of region bounded $y = x^2 - 1$ X – axis and line $y = 8$ is .....

(a) $\frac{26}{3}$ (b) $\frac{52}{3}$ (c) $\frac{104}{3}$ (d) $\frac{78}{3}$

25. The equation of curve whose slope of tangent is $-\frac{x}{y}$ and passing through (3, -4) is …….

(a) $x^2 + y^2 = 5$ (b) $x^2 + y^2 = 50$ (c) $x^2 + y^2 = 25$ (d) None

26. Equation of curve not passing through origin whose slope of tangent is $\frac{x}{y}$ represents …….

(a) Circle (b) rectangular hyperbola (c) ellipse (d) line

(Space for Rough Work)

27. $f(x,y)=\dfrac{x^{\frac{1}{2}}+y^{\frac{1}{2}}}{x^{\frac{1}{3}}-y^{\frac{1}{3}}}$ represents homogenous function of degree …….

(a) 2 (b) 3 (c) $\frac{1}{3}$ (d) $\frac{1}{6}$

28. $x=a(\theta-\sin\theta),\ y=a(1-\cos\theta)$ at $\theta=\frac{\pi}{2}$ has slope of normal …….

(a) 1 (b) -1 (c) 2 (d) None

29. The height of tower is measured from distance 200 meter and the angle of elevation was measured 30^0 but actually it was $30^0 12'$ then the error of …… meter occurs in measure of height of tower

(a) $\frac{8\pi}{81}$ (b) $\frac{8\pi}{27}$ (c) $\frac{16\pi}{27}$ (d) $\frac{4\pi}{27}$

30. The length of diagonal of square is R and area is A then $\frac{dR}{dA}$ = ...

(a) R (b) $\frac{1}{R}$ (c) $\sqrt{A}$ (d) None

31. If $y=e^{2x}+x^2$ then the length of normal at $x=0$ from origin is …….

(a) $\frac{2}{\sqrt{5}}$ (b) $\frac{4}{\sqrt{5}}$ (c) $\frac{1}{\sqrt{5}}$ (d) $\frac{3}{\sqrt{5}}$

32. If $f(x)=\begin{vmatrix} x^2 & \sin x & \cos x \\ 2 & 0 & -1 \\ a & a^2 & a^3 \end{vmatrix}$ then $f'(0)=.....$ (where a = constant)

(a) 0 (b) $a+a^2$ (c) a^3 (d) None

(Space for Rough Work)

33. If $f(x)=\begin{vmatrix} x & e^{x^4} & \cos x \\ \cos ecx & 3 & \sec x \\ \cot x & x^2 & 7 \end{vmatrix}$ then $\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} f(x)\,dx = ...$

(a) 34 (b) $1-\frac{\pi}{2}$ (c) $5e^{\pi}$ (d) 0

34. $P=\begin{bmatrix} \sin^{-} & \cos^{-} \\ -\cos^{-} & \sin^{-} \end{bmatrix}$ then $P^{-1} = ...$

(a) P^T (b) P (c) $-P^T$ (d) $-P$

35. If $A_r=\begin{bmatrix} r & r-1 \\ r-1 & 1 \end{bmatrix}, r=1,2,3.....$ then $|A_1|+|A_2|+.....+|A_{101}|=.....$

(a) 101 (b) $(101)^2$ (c) 100 (d) $(100)^2$

36. If $A=\begin{bmatrix} 3 & 1 \\ -9 & -3 \end{bmatrix}$ then $I+2A+3A^2+4A^3+.....\infty = ...$

(a) $\begin{bmatrix} 9 & 1 \\ -9 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 1 \\ -9 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 7 & 2 \\ -18 & -5 \end{bmatrix}$ (d) $\begin{bmatrix} 7 & 2 \\ -5 & -18 \end{bmatrix}$

37. $a \le \sin^{-1} x + \cos^{-1} x + \tan^{-1} x \le b$ then $a = ..., \; b = ...$

(a) $0, \pi$ (b) $\frac{\pi}{4}, \frac{3\pi}{4}$ (c) $\frac{3\pi}{4}, \frac{\pi}{4}$ (d) $\pi, 0$

(Space for Rough Work)

38. $\sin^{-1}(\sin 4)$ = ……..

(a) 4 (b) $4-2\pi$ (c) $\pi-4$ (d) Does not exist

39. If $\sin^{-1}x < \cos^{-1}x$ then …..

(a) $-1 \le x < \frac{1}{\sqrt{2}}$ (b) $-1 < x < 0$ (c) $-1 \le x < \frac{1}{2}$ (d) $-1 \le x < \frac{\sqrt{3}}{2}$

40. $f : N \times N \to N \times N,\ f((m,\ n)) = (n,\ m)$.....

(A) one-one and onto (B) many-one and onto

(C) one-one and into (D) many-one and into

(Space for Rough Work)