PUNE MCA ENTRANCE ORIGINAL QUESTION PAPERS 2014

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4. If $A=\begin{bmatrix}1 & 2\\ 3 & 5\end{bmatrix}$ then find the value of $|A^{2009} - 5A^{2008}|$ is

(a) -6 (b) -4 (c) -5 (d) None of these

5. The minimum value of the $\frac{(3+x)^2}{1+x}$ if $x \geq 0$

(a) 0 (b) 1 (c) 9 (d) 2

6. Find the 4th term in the expansion of $(1-x)^{3/2}$

(a) 0 (b) $\frac{1}{16}x^3$ (c) $\frac{-3}{8}x^3$ (d) none of these

7. If [ ] denotes the greatest integer less then or equal to x & $-1 \leq x < 0$, $0 \leq y < 1$, $1 \leq z < 2$ then the value of determinant

$$\begin{vmatrix}[x]+1 & [y] & [z]\\ [x] & [y]+1 & [z]\\ [x] & [y] & [z]+1\end{vmatrix}$$

(a) [x] (b) [y] (c) [z] (d) None of these

8. The cube root of $9\sqrt{3}+11\sqrt{2}$ is

(a) $\sqrt{3}-\sqrt{2}$ (b) $\sqrt[3]{3}+\sqrt{2}$ (c) $\sqrt[3]{3}+\sqrt[3]{2}$ (d) $\sqrt{3}+\sqrt{2}$

9. If $\int xf(x) = \frac{f(x)}{2}$ find f(x)

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

10. Find the area bounded by the curve $y = e^{2x}$ & between x axis and y axis and line x = 0 to x = 2

(a) $\frac{1}{2}(e^4-e)$ (b) $\frac{1}{2}(e^4-1)$ (c) $\frac{e^4}{4}-\frac{e}{2}$ (d) $\frac{e^4-1}{4}$

11. If $f(x) = |x|^3$ then find f'(0)

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

12. The differential equation xdy – ydx = 0 representes

(a) parabola (b) straight line (c) circle (d) hyperbola

13. If $e^y = \sin x$ and $0 < x < \pi$ then find $\frac{dy}{dx}$ in terms of x

(a) tan x (b) cotx (c) –tanx (d) –cotx

14. If $f(x) = \frac{4}{x-1}$ and g(x) = 2x and f[g(x)] = g[f(x)] then find the value of x

(a) $\left\{\frac{1}{3}\right\}$ (b) $\left\{2,\frac{1}{3}\right\}$ (c) $\left\{0,1,\frac{1}{3}\right\}$ (d) None of these

15. Find the square root of $-7-24i$

(a) 3 + 4i (b) $\frac{-7+i}{1+i}$ (c) $\frac{-7+i}{1-i}$ (d) $\frac{2+i}{4+i}$

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16. Find coefficient of x^4 in the expansion of $\frac{2+x^2}{1+x-x^2}$ in ascending power of x

(a) 12 (b) −2 (c) −4 (d) 6

17. Given $A=\begin{bmatrix} 0 & 2\beta & \gamma \\ \alpha & \beta & -\gamma \\ \alpha & -\beta & \gamma \end{bmatrix}$ and its transpose of a is equal to its inverse then

(a) $\alpha = \pm\frac{1}{\sqrt{2}}$ (b) $\beta = \pm\frac{1}{\sqrt{6}}$ (c) $\gamma = \pm\frac{1}{\sqrt{3}}$ (d) all of these

18. If $f(x)=\begin{bmatrix} x^3 & \sin x \\ 1 & 2 \end{bmatrix}$ find $\int_a^a f(x) = ?$

(a) 0 (b) $-2a^3$ (c) 3 (d) 4

19. Students in college _____ laptops to do their work

(a) are given (b) are gave (c) given (d) were used

20. Sachin will _____ degree next year.

(a) finish (b) finishes (c) finished his (d) finish his
(e) finished

21. Lectures sometimes _____ saturday.

(a) hold on (b) hold at (c) held on (d) held at

22. Dinesh had purchased four pair of shirts even though he has short of money. Choose the appropriate punctuation.

(a) Shirts. Even though he (b) Shirts, even though he
(c) shirts, even though, he (d) shirts. Even though, he

23. $[1\times 1]\begin{bmatrix} 1 & 3 & 2 \\ 0 & 5 & 1 \\ 0 & 3 & 2 \end{bmatrix}\begin{bmatrix} 1 \\ 1 \\ x \end{bmatrix} = 0$

then the best approxiation of x

(a) −.8599 (b) −.8597 (c) −.8595 (d) −.8588

24. One hundered identical coins, each with probability p of showing heads are tossed once. If $0 < p < 1$ and the probability of heads showing on 50 coins is equal to that heads showing on 51 coins, the value of p is

(a) $\frac{1}{2}$ (b) $\frac{50}{101}$ (c) $\frac{51}{101}$ (d) $\frac{49}{101}$

25. Find the value of m for which the given equations $3x + my = m$ and $2x - 5y = 20$ has solution satisfying the condition $x > 0, y > 0$

(a) $\left(-\infty, \frac{-15}{2}\right)$ (b) $(30, \infty)$ (c) $\left(-\infty, \frac{-15}{2}\right) \cup (30, \infty)$ (d) None of these

26. Find the value of x for which the equation $x^2 - 5x + 3 + 2\sqrt{x^2 - 5x + 3} = 15$ has real solution

(a) 6 (b) 1 (c) $\frac{5+\sqrt{113}}{2}$ (d) $\frac{5-\sqrt{113}}{2}$

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27. For three events A, B and C, P (exactly one of the events A or B occurs) = P (exactly one of the events B or c occurs) = P (exactly one of the events C or A occurs) = p and P (all the three events occurs simultaneously) = p^2 where $0 < p < 1/2$. Then the probability of at least one of the three events A, B and C occuring is

(a) $\frac{3p+2p^2}{2}$ (b) $\frac{p+3p^2}{2}$ (c) $\frac{3p+p^2}{2}$ (d) $\frac{3p+2p^2}{4}$

28. A point (p, q) lies on the curve $2y = x^2$ is nearest to the point (4, 1) then the point (p, q) satisfy the condition

(a) $p < 1, q > 3$ (b) $p > 1, q < 3$ (c) $p < 3, q < 3$ (d) None of these

29. Evaluate limit $\lim_{x \to \infty} n\sin(2\pi n!e)$ equal

(a) π (b) $\frac{\pi}{2}$ (c) 2π (d) None of these

30. If $z = a + ib$, the the points z, $\bar{z}$ and origin (0, 0) form

(a) Equilateral (b) Isosecles
(c) right angle (d) Triangle with all three acute angle

31. India plays two matches each with West Indies and Australia. In any match the probabilities of India getting points 0, 1 and 2 are 0.45, 0.05 and 0.5 respectively. Assuming that the outcomes are independent, the probability of India getting at least seven point is

(a) 0.8750 (b) 0.0875 (c) 0.0625 (d) 0.0250

32. A students appears for test I, II and III. The student is successful if he passes either in tests I and II or tests I and III. The probabilities of the students passing in tests I, II and III are p, q and 1/2 respectively. If the probability that students is successful is 1/2 then

(a) $p = q = 1$ (b) $p = q = 1/2$ (c) $p = 1, q = 0$
(d) there are infinite values of p and q

33. If $x = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ then x^n is equal to

(a) $\begin{bmatrix} 3n & -4n \\ n & -n \end{bmatrix}$ (b) $\begin{bmatrix} 2+n & -n \\ n & 5-n \end{bmatrix}$ (c) $\begin{bmatrix} 3^n & -4^n \\ 4 & (-1)^n \end{bmatrix}$ (d) None of these

34. Ram and shyam have equal number of daughters. There are three cinema tickets which are to be distributed among the daughters of Ram and Shyam. The probability that the two tickets goes to the daughter of one and one ticket goes to another daughters is 6/7. Then the number of daughter each of Ram and Shyam have

(a) 3 (b) 4 (c) 8 (d) None of these

35. An ordinary cube has 4 blank faces, one face marked 2 and another face marked 3. Then the probability of obtaining 12 in 5 throw is

(a) $\frac{5}{1296}$ (b) $\frac{5}{1944}$ (c) $\frac{5}{2592}$ (d) None of these

36. $\frac{3z+1}{z} = \frac{z}{3z+4}$, where z is complex number, then find the number of solution of z satisfying the equation

(a) zero (b) atmost 2 (c) atleast 2 (d) Infinite solution

37. Satish had stopped car at petrol pump because there _____ petrol in the tank

(a) isn't much (b) wasn't much (c) isn't many (d) wasn't many

38. There are 120 students in a class, the students opted physics are even numbered, and the students opted mathematics are divisible by 5 and the students opted chemistry are divisible by 7. Then find the number of students which had taken none of the above subjects

(a) 9 (b) 41 (c) 84 (d) none of these

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39. Three of the six vertices of a regular hexagon are chosen of random. The probability that the triangle with these three vertices is equilateral triangle is equal to

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

40. All +ve number that are multiple of 3 are put in just a position forming an infinite string of digit for example
Multiple of 3 : 369121518212427.....
in just a position of multiple of 3
8th digit from the left of string 1
9th digit from the left of string 8. Then
200th digit from the left of string
(a) 1 (b) 3 (c) 7 (d) none of these

41. According to above question
2000th digit from the left of string
(a) 3 (b) 7 (c) 9 (d) None of these

42. Find the locus of a point which divides the line AB externally in the ratio $\frac{1}{2}:1$. Where A is a point on parabola $y^2-2y-4x+5=0$ from which tangent is drawn which meets the directrix at B.
Then find the locus

(a) $(x+1)(y-1)^2=-4$ (b) $(x-1)(y-1)^2=-4$

(c) $(x-2)(y-1)^2=-4$ (d) none of these

43. If $AA^T = I$ & det A = 1 then which is correct
(a) A - I = 0 (b) A + I = 0 (c) A - 2I = 0 (d) None of these

44. If f(x) = 1 for x is a rational number and f(x) = 0 for x is irrational number then $\lim_{x\to 0} f(x)$ is

(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) None of these

45. $\lim_{x\to 0}(1+3x)^{\frac{1}{x}}$

(a) e^{-3} (b) e^3 (c) 3 (d) -3

46. For the real value of (a, b) the function $f(x)=\frac{x}{x^2-5x+9}$ lies in (a, b)

(a) a = 0 b = 0 (b) $a=-\infty$ b = 0

(c) $a=\frac{-1}{20}$ b = 2 (d) $a=\frac{-1}{11}$ b = 1

47. There were three logistician peoples name Galelio, Newton, Einstein and the another man Archimeds who challenged them to play a game to check their reasoning ability. Archimeds had 4 blue tickets and 4 yellow tickets. Out of these eight tickets he posted two tickets on the forehead of each of them and put the remaining two in his pocket after that they were asked to guess the colours of tickets on their foreheads. But in terms he saw only the ticket of otheres but not see the colour of ticket on their own forehead
Their replies are

Galelio : No
Newton : No
Einstein : No
Galelio : No
Newton : Yes
then what was the colour of tickets on Newtons forehead
(a) both blue (b) both yellow (c) can not be determined (d) none of these

48. If $\int_1^2 f(x-c)\,dx = 5$ then what will be the value of $\int_{1-c}^{2-c} f(x)\,dx =$
(a) 5 + c (b) 5 - c (c) c (d) 5

49. Three numbers are choosen randomly from 1 to 100 then find the probability of getting number which are divisible by both 2 and 3
(a) $\frac{4}{25}$ (b) $\frac{4}{1155}$ (c) $\frac{9}{1024}$ (d) None of these

50. The probability of obtaining 6 first time in repeatedly throw of cube. Then find the probability that six obtained for first time in $n \geq 3$
(a) $\frac{25}{36}$ (b) $\frac{1}{36}$ (c) $\frac{5}{36}$ (d) None of these

The standard analogue clock will having the hour hand and minute hand and second hand

51. If we start counting at 00 : 01 then the second hand shown 'xx' seconds after that minute hand just passed over the hour hand 5 time, then 'xx' equals
(a) 5 (b) 16 (c) 27 (d) none of these

52. If we start counting at 00 : 01 then the second hand shown 'xx' second after that the minute hand just passed over the found hand 8 times, then 'xx' equals
(a) 16 (b) 28 (c) 26 (d) none of these

53. In equation $2x^3 + x + n = 0$ roots lies between [0, 1] then the value of x
(a) lie between 0 & 1 (b) lie between -1 & 1 (c) lie between 2 & 3 (d) None of these

54. There are n differents keys find the probability that the perticular lock is opened at the k^{th} time when it is given that each key is tried only once
(a) $\frac{1}{n}$ (b) $\frac{1}{k}$ (c) $\frac{k}{n}$ (d) none of these

55. A particle, moves along a straight line with velocity $v(t) = t^2$ then displacement between t=1 & t = 2
(a) $\frac{7}{3}$ (b) $\frac{8}{3}$ (c) 9 (d) None of these

56. $A^2 + A + 2I = 0$ then which is incorrect
(a) A is non - singular (b) $A \neq 0$ (c) A is symmetric (d) $A^{-1} = \frac{-1}{2}(A + I)$

57. For 3 × 3 matrix A where all the elements are either 0 or 1. Then the maximum value of $|A|$ cannot exceeds
(a) 4 (b) 2 (c) 1 (d) None of these

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58. If it is, given that the value of a + b = 100 then maximum value of ab is
(a) less than 2601 (b) greater than 2601
(c) greater than 2601 and less than 2800 (d) less than 2400

59. k persons are distributed over n cells then find the probability that k person are sitting in adjacent to each other in cells

(a) $\frac{(n-k)!}{n!}$ (b) $\frac{(n-k+1)\mathrm{k}!}{n^k}$ (c) $\frac{(n-k+1)\mathrm{k}!}{n!}$ (d) None of these

60. Determinant of A = 11 then determinant of matrix formed by cofactor of the value lie between
(a) between 101 to 161 (b) between 200 to 300
(c) between 50 to 100 (d) greater than 150

61. Find volume of y = sec x in first quadrant between $0 < x < \frac{\pi}{4}$.

(a) π (b) 2π (c) $\pi-2$ (d) $\pi-1$

ALL AIR (ALL INDIA RANK)
ARE IN GENERAL CATEGORY

University of Pune MCA Entrance - 2014 Answerkey

1.(C)	2.(C)	3.(A)	4.(A)	5.(WRONG)	6.(B)	7.(C)	8.(D)	9.(D)	10.(B)
11.(B)	12.(B)	13.(B)	14.(A)	15.(B)	16.(A)	17.(D)	18.(A)	19.(A)	20.(D)
21.(C)	22.(C)	23.(A)	24.(C)	25.(C)	26.(A)	27.(A)	28.(C)	29.(D)	30.(B)
31.(B)	32.(C)	33.(D)	34.(B)	35.(C)	36.(B)	37.(B)	38.(B)	39.(C)	40.(B)
41.(B)	42.(A)	43.(A)	44.(A)	45.(B)	46.(D)	47.(D)	48.(D)	49.(B)	50.(A)
51.(D)	52.(C)	53.(D)	54.(C)	55.(A)	56.(C)	57.(B)	58.(A)	59.(B)	60.(A)
61.(A)									