PaGaLGuY.com **MBA 2007 Series**

JMET – Strategize and Practice

By TCY
Published December 07, 2007

Hi! Our friends from TCY have laid bare a really meticulous analysis of the JMET exam from previous years, which we thought might be useful for you. At the end of the analysis, you'll also find a compilation of questions from JMET papers of previous years. Take a crack at them and see where you stand in the final run to the actual exam. (Terms of agreement before reading further: This question-sheet is Beerware. It means that if you liked it, you promise to buy the PaGaLGuY.com and TCY teams a beer whenever you meet them!)

JMET – Once could call it **J**ust **M**ath and **E**ntirely-math **T**est!

True to its essence, the Quantitative section in JMET (Joint management entrance test) has troubled many techies planning to make their MBA dream come true. The test is exclusively for engineers and is for admission to MBA programmes in IISc Bangalore and IITs in Delhi, Bombay, Kanpur, Chennai, Kharagpur and Roorkee. The Quantitative section is dominated by tough, lengthy and trickier questions and has been the only section that decided one's edge over others in the recent years.

Over the years, JMET Quantitative section has continued to be the nightmare for the aspirants. If you are taking JMET 2007 on December 9, 2007; be prepared to face questions from integral calculus, derivatives, complex numbers, vector product, conics, trigonometry and matrices. What is recommended by experts at this hour is to at least surf through the following topics:

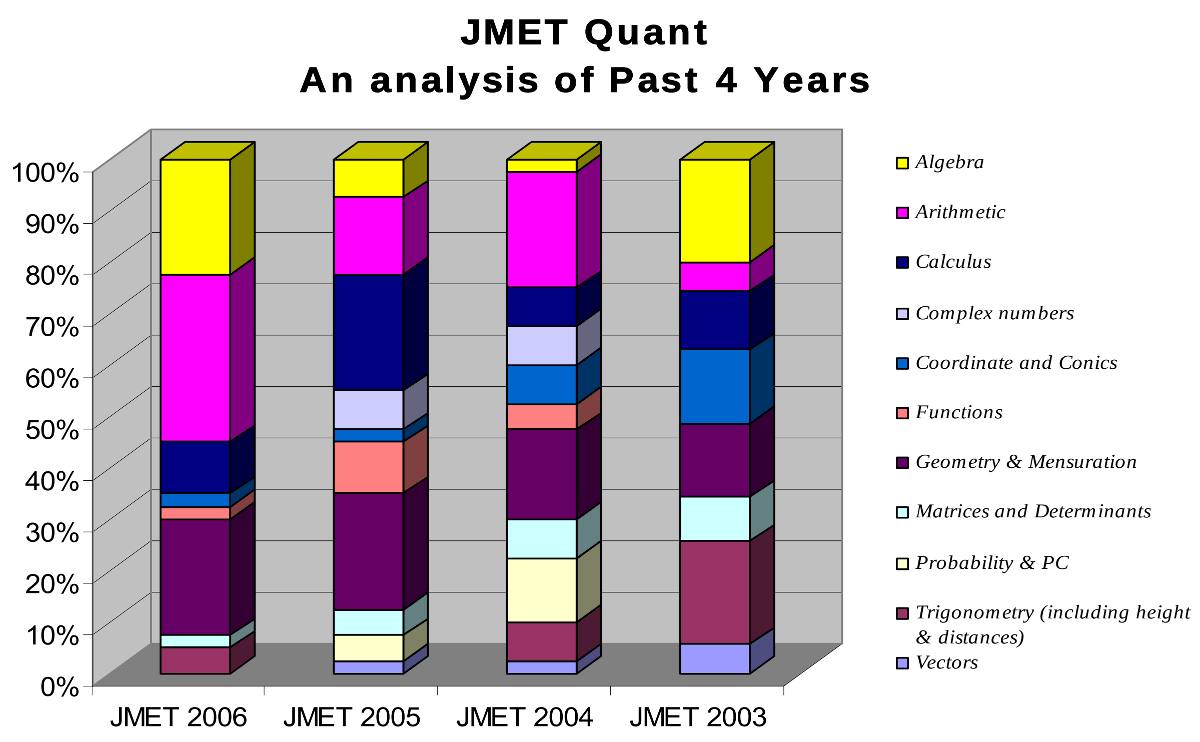
- Standard formulae of integration and solving using substitution method
- Limits standard result and solving with L- hospital rule
- Maxima/ Minima using derivatives
- Identities of Matrices and determinants

An analytical study of the past 4 years JMETs confirms the above stand point about the difficulty level of Quantitative section.

The following table summarizes the comparison and trends:

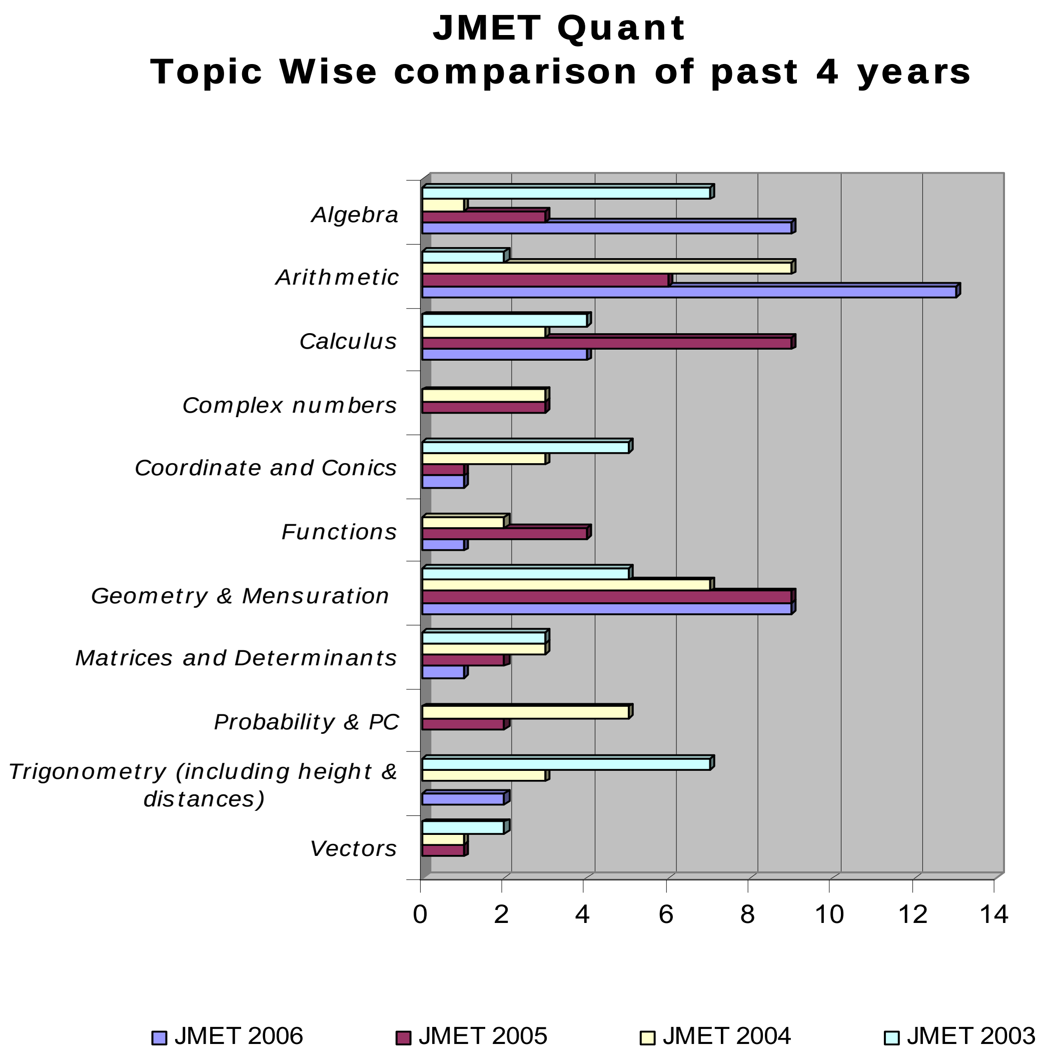
JMET 2006	JMET 2005	JMET 2004	JMET 2003
1. Quant section was of very high difficulty level. 2. Higher Maths was not the major destructor. 3. Algebra and Geometry ensured tough times for the takers. 4. A good attempt had been 40%.	1. Quant section was the toughest. 2. Questions from correlation, vectors, functions, limits, integration and differentiation were the real tough ones. 3. Expect good takers to attempt mere 25% of questions with reasonable accuracy.	1. Quant section was the real bouncer. 2. Questions from Normal deviation, vectors, limits, determinants and trigonometry. 3. A good attempt was expected to be near 30%	1. Quant section was the most difficult. 2. Tough and trickier questions from arithmetic. 3. A good attempt had been near 20%

An over all division of the total number of questions has been given below. It is apparent from the graph that Algebra and Arithmatic have been the hot faourites of the exam setters. Trigonometry, Geometry and Mensuration also take a good share in the total number of questions.



Data Source: *Past 4 years' JMETs*

Following is the subject wise comparison of the past 4 JMETs:



Data Source: *Past 4 years' JMETs*

It is fairly obvious from the above graph that popularity of questions from Algebra and arithmetic has grown in the past 4 years. On the other hand, decreasing number of questions from Probability, Permutations and combinations and complex numbers is being considered as a saving grace by the test takers.

From the next page, you'll find some representative questions compiled from JMET of previous years by the TCY team.

JMET Questions from previous years

1. The determinant $\begin{vmatrix} 1+x_1 & x_1 & x_1 & x_1 \\ x_2 & 1+x_2 & x_2 & x_2 \\ x_3 & x_3 & 1+x_3 & x_3 \\ x_4 & x_4 & x_4 & 1+x_4 \end{vmatrix}$ equals

   (A) $1 + x_1 + x_2 + x_3 + x_4$ (B) $x_1 + x_2 + x_3 + x_4$

   (C) $x_1x_2x_3x_4$ (D) $1 + x_1x_2x_3x_4$

2. $x^2 - 2x + y^2 - 4y + 5 = 0$ on the xy-plane represents

   (A) a point (B) a circle (C) an ellipse (D) a hyperbola

3. The function $f(x) = mx + \sin x$ will have an inverse if and only if

   (A) $-1 \le m \le 1$ (B) $m < -1$ (C) $m > 1$ (D) $|m| > 1$

4. Area (in sq units) bounded by the line $y = x$ and the parabola $y = x(x - 2)$ is

   (A) $\frac{19}{6}$ (B) $\frac{9}{2}$ (C) $\frac{35}{6}$ (D) $\frac{43}{6}$

5. The minimum attainable value of the function

   $f(x, y) = \sqrt{x^2+1} + \sqrt{(x-y)^2+4} + \sqrt{(12-y)^2+4}$ is

   (A) 12 (B) 13 (C) $3 + \sqrt{148}$ (D) $4 + \sqrt{145}$

6. Let $[x]$ represent the greatest integer $\le x$. Define $f: R \to R$ by $f(x) = [x] + [-x]$. At any integral value of x, the function $f(x)$ is:

   (A) Continuous (B) Discontinuous but has a unique limit

   (C) Does not have a limit (D) Has only left hand limit

7. The position vector of the mirror image of the point represented by the position vector $\vec{r} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ across the plane mirror $x + y = 0$ is:

   (A) $-3\hat{i} - 2\hat{j} + 4\hat{k}$ (B) $2\hat{i} + 3\hat{j} - 4\hat{k}$ (C) $-2\hat{i} - 3\hat{j} + 4\hat{k}$ (D) $3\hat{i} + 2\hat{j} - 4\hat{k}$

8. For $0 < \phi < \pi/2$, let $\alpha = \sum_{n=0}^{\infty} \sin^{2n}\phi$; $\beta = \sum_{n=0}^{\infty} \cos^{2n}\phi$, then the value of $\alpha^{-1} + \beta^{-1}$ will be:

   (A) 1 (B) i (C) -1 (D) 0

9. Define $\phi(x) = \prod_{i=1}^{n} (x - x_i)$ then the value of $\sum_{i=1}^{n} \frac{x_i}{x - x_i}$ is:

(A) $\frac{n\phi'(x) - x\phi(x)}{\phi(x)}$ (B) $\frac{n\phi(x) - x\phi'(x)}{\phi(x)}$ (C) $\frac{x\phi(x) - n\phi'(x)}{\phi(x)}$ (D) $\frac{x\phi'(x) - n\phi(x)}{\phi(x)}$

10. Point P has co–ordinates (3, 2) with reference to a rectangular frame in two dimensional space. This coordinate frame is rotated in the clockwise direction through an angle of 30^o ($\pi/6$ radians). The coordinates of P with reference to the rotated frame are:

(A) $\left(\frac{3\sqrt{3}}{2} - 1, \frac{3}{2} + \sqrt{3}\right)$ (B) $\left(\frac{3\sqrt{3}}{2} + 1, \frac{3}{2} - \sqrt{3}\right)$

(C) $\left(-\frac{3\sqrt{3}}{2} - 1, -\frac{3}{2} + \sqrt{3}\right)$ (D) $\left(\frac{3\sqrt{3}}{2} + 1, \frac{3}{2} + \sqrt{3}\right)$

11. A complex number z lies on the curve $|z + 6| = 3$. The largest magnitude of $|z + 3|$ will be

(A) 6 (B) 3 (C) 36 (D) 12

12. $\sum_{k=1}^{i=1}\left[\sin\left(\frac{2k\pi}{l}\right) - i\cos\left(\frac{2k\pi}{l}\right)\right]$ is equal to (where $i = \sqrt{-1}$)

(A) 1 (B) – 1 (C) –i (D) i

13. $\lim_{n \to \infty} \left(2^n + 7^n\right)^{\frac{1}{n}}$ is equal to:

(A) 7e (B) 7 (C) 2e (D) 2

14. If $z \in C$ lies on the circle whose equation is $|z - 3i| = 3\sqrt{2}$, then the argument of $\frac{(z-3)}{(z+3)}$ is:

(A) $\frac{\pi}{4}$ (B) $\tan^{-1}3$ (C) $\tan^{-1}3\sqrt{2}$ (D) $\frac{\pi}{2}$

15. $\int_0^{\pi} |\sin x + \cos x|\, dx$ is equal to:

(A) 0 (B) $\sqrt{2}$ (C) $2\sqrt{2}$ (D) $\frac{1}{\sqrt{2}}$

16. $\lim\limits_{n \to \infty} \frac{1}{n}\begin{pmatrix} 1 & a/n \\ -a/n & 1 \end{pmatrix}^n$ is equal to:

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

17. Operator A has the matrix representation A = $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ in conventional $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$, $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$ basis. Its representation in the basis of its eigenvectors (eigen basis) $\begin{pmatrix} 1 \\ i \end{pmatrix}$, $\begin{pmatrix} 1 \\ -i \end{pmatrix}$ is:

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

18. We define f : R → R by f(x) = $\frac{1}{1-x}$. Then the function f(f(f(x))) is discontinuous at:

(A) 0 and – 1 (B) – 1 and 1 (C) – 1 (D) None of the above

19. $\lim\limits_{n \to \infty} \sum\limits_{r=1}^{n} \tan^{-1}\left(\frac{1}{2r^2}\right)$ is equal to:

(A) $\frac{\pi}{4}$ (B) $\tan^{-1}\frac{1}{2}$ (C) π (D) $\frac{\pi}{2}$

20. We define the modulus of a m × n matrix by |A| = $\max\limits_{i}\left(\sum\limits_{i=1}^{m} |a_{ij}|, j = 1, 2, \ldots n\right)$. The angle θ, (0 < θ ≤ π/2), for which the matrix $\begin{pmatrix} \cos\theta & \sin\theta & 0 \\ -\sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{pmatrix}$ will have the maximum possible modulus is:

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{2}$

(D) None of the above

Answers on Next Page

ANSWERS

1. (A)	2. (A)	3. (D)	4. (B)	5. (C)
6. (B)	7. (A)	8. (A)	9. (D)	10. (A)
11. (A)	12. (C)	13. (B)	14. (A)	15. (A)
16. (A)	17. (C)	18. (D)	19. (A)	20. (D)