# **Intermediate-2012 MATHS IB Guess Paper**

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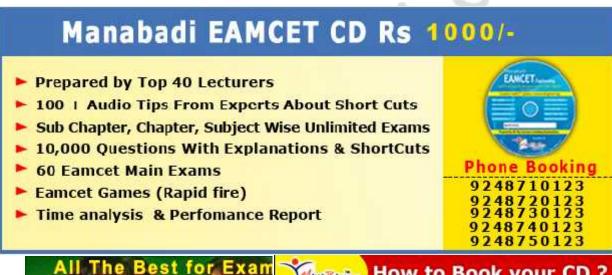
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#### Section - A

#### Note:

- 1. Answer all the questions
- 2. Each question carries 2 Marks
- 3. All are very short Answer Type Questions







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- 1. Transform the equation x + y + 1 = 0 into normal form.
- 2. Find the equation of the straight line passing through the point (3,-4) and making x, y intercepts which are in the ratio 2:3.
- 3. IF (3,2,-4), (4,1,1) and (6,2,5) are three vertices of tetrahedron and (4,2,2) is its centroid then find the fourth vertex.
- 4. Find the angle between the planes x + 2y + 2z 5 = 0 and 3x + 3y + 2z 8 = 0

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5. Find 
$$Lt_{x\to 0}\left(\frac{3^x-1}{\sqrt{1+x}-1}\right)$$

6. Find 
$$Lt_{x\to 0+} \left(\frac{2|x|}{x} + x + 1\right)$$

7. Find 
$$\frac{d}{dx} \tan^{-1} \sqrt{\frac{1-\cos x}{1+\cos x}}$$

8. Find 
$$\frac{d}{dx}x^x$$

9. Find 
$$\Delta y$$
,  $dy$  if  $y = x^{x} + x$  at x=10,  $\Delta x$ =0.1

10. Find the value of 'c' in Rolle's Theorem for the function 
$$f(x) = x^2 + 4$$
 on [-3,3]

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### Section - B

#### Note:

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- 1. Answer any FIVE questions
- 2. Each question carries 4 Marks
- 3. All are short Answer Type Questions
- 11. A (2,3) B(-3,4) are two fixed points. Find the equation of locus of 'P' so that area of  $\triangle PAB$  is 8.5 sq. units.
- 12. When the axes are shifted to the point (2, 3) then the transformed equation of a curve is  $x^2 + 3xy 2y^2 + 17x 7y 11 = 0$ . Find the original equation of the curve.

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- 13. A straight line through Q( $\sqrt{3}$ , 2) makes an angle  $\frac{\pi}{6}$  with the positive direction of x-axis. If the straight intersects the line  $\sqrt{3}x 4y + 8 = 0$  at 'P', find the distance 'PQ'.
- 14. Show that  $f(x) = \frac{\cos ax \cos bx}{x^2}$  if  $x \ne 0$ =  $\frac{1}{2}(b^2 - a^2)$  if x = 0

Where a, b are real constants, are continuous at x=0

- 15. Find the derivative of  $\sin 2x$  from the first principles.
- 16. The radius of a circle is increasing at the rate of 0.7 cm/sec. What is the rate of increase of its: i) Circumference
  - ii) Area
- 17. Show that the length of the subnormal at any point of the curve  $y^2 = 4ax$  is a constant.

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## Section - C

#### Note:

- 1. Answer any FIVE questions
- 2. Each question carries 7 Marks
- 3. All are Long Answer Type Questions
- 18. Find the circumcentre of the triangle formed by (1,3), (0,-2) and (-3,1)
- 19. If the equation  $ax^2 + 2hxy + by^2 = 0$  represents a pair of lines then the combined equation of pair of bisectors of angle between these lines is  $h(x^2 y^2) = (a b)xy$ .
- 20. Find the value of 'K' if the lines joining the origin of the points of intersection of the curve  $2x^2 2xy + 3y^2 + 2x y 1 = 0$  and the line x + 2y = k are mutually perpendicular.
- 21. IF ray makes an angle  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  with four diagonals of a cube then find  $\cos^2\alpha + \cos^2\beta + \cos^2\gamma + + \cos^2\delta$

22. If 
$$\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$$
. Show that  $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$ 

- 23. If the tangent at any point 'P' on the curve  $x^my^n=a^{m+n}$  meets the co-ordinate axis in A and B then show that AP:PB is constant.
- 24. Show that when the curve & surface of right circular cylinder in a sphere of radius 'r' is maximum, then the height of the cylinder is  $\sqrt{2}$  r.