

MM: 20 **Class Test XII A** Time: 30 min

Each Question Carries 5 marks

**Q1.** The surface area of a spherical bubble is increasing at the rate of  $2\text{ cm}^2/\text{sec}$ . Find the rate at which the volume of the bubble is increasing at the instant its radius is 6 cm.

**Q2.** Prove that  $y = \frac{4\sin\theta}{(2+\cos\theta)} - \theta$  is an increasing function of  $\theta$  in  $\left[0, \frac{\pi}{2}\right]$ .

**Q3.** Find the equation of the tangent to the curve  $y = \sqrt{3x-2}$  which is parallel to the  $4x-2y+5=0$ .

**Q4.** Using differentials, find the approximate value of  $(81.5)^{1/4}$ .

Note: 1. Solution key / marks will be available at my blog:

[www.amitbajajmaths.blogspot.com](http://www.amitbajajmaths.blogspot.com)

2. Next test scheduled on 23 Aug 2011 (Ex 6.5 + Misc)

MM: 20 **Class Test XII B** Time: 30 min

Each Question Carries 5 marks

**Q1.** The volume of spherical balloon is increasing at the rate of  $25\text{ cm}^3/\text{sec}$ . Find the rate of change of its surface area at the instant when its radius is 5 cm.

**Q2.** Show that  $y = \log(x+1) - \frac{2x}{2+x}$ ;  $x > -1$  is an increasing function of  $x$  throughout its domain.

**Q3.** Find the equation of the tangent line to the curve  $y = x^2 - 2x + 7$  which is perpendicular to the line  $5y - 15x = 13$ .

**Q4.** Using differentials, find the approximate value of  $(15)^{1/4}$ .

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MM: 20 **Class Test XII C** Time: 30 min

Each Question Carries 5 marks

**Q1.** Sand is pouring from a pipe at the rate of  $12\text{ cm}^3/\text{s}$ . The falling sand forms a cone on the ground in such a way that the height of the cone is always one-sixth of the radius of the base. How fast is the height of the sand cone increasing when the height is 4 cm?

**Q2.** Find intervals on which  $f(x) = 5 + 36x + 3x^2 - 2x^3$  is (i) increasing (ii) decreasing:

**Q3.** Find the equation of the normals to the curve  $y = x^3 + 2x + 6$  which are parallel to the line  $x + 14y + 4 = 0$ .

**Q4.** Using differentials, find the approximate value of  $(29)^{1/3}$ .

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