

Physics 200B
Exam 3 review *DRAFT*

Wednesday November 12 during regular class time
New sections covered: 7.6-7.7, 7.9, 8.1-8.5, 9.1-9.6, 10.1-10.9

Expect problems and questions similar in form to lab homework, concept questions, quiz questions, and text problems. There will be about 3 pages of problems and 1 page of short answer/choose the best answer/fill in the blank questions. Problems and questions will emphasize concepts and techniques covered in class, but applied to new situations.

Information to be provided on exam:

$$v_{xf} = v_{xi} + a_x t$$

$$x_f - x_i = \bar{v}_x t = \frac{1}{2}(v_{xi} + v_{xf})t$$

$$x_f - x_i = v_{xi} t + \frac{1}{2} a_x t^2$$

$$v_{xf}^2 = v_{xi}^2 + 2a_x(x_f - x_i)$$

$$a_c = v^2/r \quad \vec{u}_{PA} = \vec{u}_{PB} + \vec{v}_{BA}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$F = G \frac{m_1 m_2}{r^2}$$

$$\sum \mathbf{F} = m\mathbf{a} \quad f_s \leq \mu_s n \quad f_k = \mu_k n$$

$$W = F \Delta r \cos \theta = \int F_x dx \quad \mathbf{F}_s = -k\mathbf{x} \quad W_s = \frac{1}{2} kx_i^2 - \frac{1}{2} kx_f^2$$

$$K \equiv \frac{1}{2} m v^2 \quad W_{\text{net}} = K_f - K_i$$

$$U_g = mgy \quad U_s = \frac{1}{2} kx^2$$

$$\Delta K + \Delta U + \Delta E_{\text{int}} = W + Q + T$$

$$K_f + U_f = K_i + U_i \quad \Delta E_{\text{int}} = f_k d$$

$$P = \frac{dE}{dt} = Fv \quad P_{\text{avg}} = \frac{\Delta E}{\Delta t}$$

$$\vec{p} = m\vec{v} \quad \sum \vec{p}_i = \sum \vec{p}_f \quad \vec{I} = \int_{t_i}^{t_f} \sum \vec{F} dt = (\sum F)_{\text{avg}} \Delta t \quad \Delta \vec{p} = \vec{I}$$

$$v_{1i} - v_{2i} = - (v_{1f} - v_{2f})$$

$$x_{cm} = \frac{\sum m_i x_i}{M} \quad y_{cm} = \frac{\sum m_i y_i}{M}$$

$$\omega_f = \omega_i + \alpha t$$

$$\theta_f - \theta_i = \frac{1}{2}(\omega_i + \omega_f)t$$

$$\theta_f - \theta_i = \omega_i t + \frac{1}{2}\alpha t^2$$

$$\omega_f^2 = \omega_i^2 + 2\alpha(\theta_f - \theta_i)$$

$$s = r\theta \quad v = r\omega \quad a_t = r\alpha \quad I = \sum m_i r_i^2 \quad K_R = \frac{1}{2}I\omega^2 \quad I = I_{CM} + MD^2$$

$$\tau = rF \sin \varphi = Fd \quad \sum \tau = I\alpha \quad K = \frac{1}{2}I_{CM}\omega^2 + \frac{1}{2}mv_{CM}^2 \quad v_{CM} = R\omega \quad a_{CM} = R\alpha$$

Other information that will be provided:

- Conversion factors (table inside back cover of book)
- Any constants or physical data needed for a particular problem (such as the radius of the Earth, mass of an electron, etc.)
- Table 10.2

You should know, understand, and be able to use the definitions of average and instantaneous velocity and acceleration (for translational motion as well as for rotational motion).

You should be able to use trig functions and the Pythagorean theorem to find missing sides and angles of a right triangle. (You do not need to know the law of cosines or the law of sines.)

You should also know what the metric prefixes μ , m, c, and k stand for!