



**PROBLEMS ON COGNITIVE &
PHYSICAL WORK ENVIRONMENT**

APPLIED PROBLEMS ON COGNITIVE ERGONOMICS

- An individual is capable of detecting a small object that is 20 mm high at a distance of 35 m. Determine the visual angle subtended by the object and the visual acuity of the individual?

$$\alpha_v = 3438(20)/35,000 = 1.96 \text{ arc min}$$
$$VA = 1/1.96 = 0.51$$

- What is the decibel level (*SPL*) of a sound that has a pressure of 0.75 Pa?

- An isotropic light source has an intensity of 250 candela. Located 3 m away is an object whose surface has a reflectance of 0.35. Calculate (a) the total luminous flux emanating from the light source, (b) the illuminance of the surface of the object, and (c) the luminance emitted by the reflected light.

- A ceiling lamp (assume a point source of light) has a luminous intensity of 200 candelas and its distance above an office desk is 1.5 m. It provides direct lighting of the desk surface, which is medium gray and has a reflectance of 0.55. The worksheets being processed are white (reflectance = 0.80) with black lettering (reflectance = 0.08). The average size of the lettering is 2.5 mm, and the worker's eyes are about 300 mm away from the worksheets. Determine (a) the illuminance striking the desk surface, (b) the luminance of the desk surface, (c) the contrast between the worksheets and the lettering, and (d) the visual angle subtended by the lettering as seen by the worker.

- A worker is exposed to two noise sources, one at 86 dBA and the other at 90 dBA. Determine (a) the total sound pressure level of the two sources and (b) the permissible duration of exposure for this sound pressure level.



THANK YOU

