**1. Describe the basic duties of a DP. Explain the difference between a director of photography and a cinematographer.**

**Answer:** The director of photography does not operate the camera while a cinematographer does. The cinematographer can manipulate a camera and a set of lights to capture the director’s vision for the movie. The director of photography works *with* the cinematographers in big productions. The cinematographer is ultimately responsible for the selection of film stock (this duty is probably dying out due to the digital age), cameras, lenses, designing and selecting lighting, directing the gaffer’s placement of lighting, shop composition (along with the Director), film developing and film printing.

**2. What jobs comprise the director of photography’s crew? What are the duties of each member of his team?**

**Answer:** The DP’s crew consists of camera operator, 1st assistant camera operator (focus puller), 2nd assistant camera operator (clapper/loader).

**3. Why is depth perception important when lighting an actor?**

**Answer:** The ultimate goal of the camera (and lens) and light is to mimic what the human eyes can see. The two eyes give us the depth perception, which helps us differentiate between foreground and background images. It is of utmost important to provide that differentiation with the camera. And since there is only one camera, it is possible to provide that differentiation through lighting.

**4. What are the three main lights used in cinematography? How are they used together to create "the visual image"?**

**Answer:** The three main lights used in cinematography are “key”, “light” and “backlights”. The key light is directly pointed at the subject’s face. This will wash out all the shadows out of the subject (the face, for example) and make it look flat. The shadows can be restored with a fill light. It is on the side of the subject and causes shadows to be cast by the nose and brow. The backlight is added to separate the subject from the background. It is shined at the back of the subject’s head and causes a halo effect. This halo effect is what triggers the human eye in to seeing a separation of the subject from the background. A very important tip about lighting is to ensure we can see the dots of light in a subject’s eye: the dot brings the eye out and lends humanity to the flat, two-dimensional face on the screen.

**5. What is the difference between tungsten incandescents and HMIs? What is the purpose of each?**

**Answer:** Tungsten light give us yellow light while HMIs give blue light. Typically, tungstens are used inside and HMIs are used outside. Tungsten is a filament inside of a incandescent light bulb. HMI stands for Hyragyrum Medium-Acr lodide, a type of light that uses an acr lamp instead of an incandescent bulb to produce light. They are high quality and are typically more expensive than tungsten lights.

**6. What are some of the other tools a director of photography will use to create lighting effects?**

**Answer:** Gels (colored sheets of cellophance, placed in front of the lights), scrims (anything used to diffuse the lights, usually made out of fabric), cucolorises (patterns in light, typically made from wood, plastic or fabric), bounce (used to bounce light from one source in another direction, typically made from large pieces of reflective foam, mirrors or a shiny piece of plastic, used especially outdoors to reflect the sunlight). To hold the lights, several tools such as C-stands, tripods with sandbags and light meters are used to ensure the subject and the background are properly lit.

**7. What are the different parts of a camera?**

**Answer:** All cameras (digital, film, still, motion picture, etc) hav five components: a box that can trap light (a light-tight box), a lens, a shutter, an iris/aperture and a flat surface that sits opposite to the lens to capture light-sensitive media.

**8. Why is "vetting" your DP so important? When vetting him, what characteristics are you looking for? What do you want to avoid?**

**Answer:** Vetting the DP (Director of Photography) is extremely important because he is the most “talked-to” resource for the Director, after the actors. The DP is also in-charge of many aspects of crew management and often selects his/her own camera crew, which includes grips, gaffers, 1st AC, 2nd AC (Assistant Cameraperson) and the camera operator. Vetting for the DP is just as important as auditioning for actors. Two things stand out during the vetting process: check out their previous work and also ask for references. Also, search around for other people that the DP has worked with and talk to them to understand how the DP works: his/her communication style and work ethic are things to realize and understand before production begins. All of the team members that report to DP are essential to properly captures the actors on the screen. The DPs to avoid are the ones who aren’t competent, who do not understand your communication style, who don’t have the experience and who aren’t flexible to your ideas about the film. The worst are the ones who do not agree or understand with the vision of your film. It’s better not to have such people on the production set. Since it is extremely challenging to completely understand lighting, it is best to hire a very good (the best) DP available and then give him/her the examples from films you have seen to mimic it. Then trust the DP and the crew to deliver it for you.

**9. What is the most important quality of a camera?**

**Answer:** The most important quality of a camera is the ability to restrict the light falling on to the film. Without this function, no camera body, no lens, no iris and no shutter can capture the images that the Director wants. A 70-year old Brownie camera and a modern RED first and foremost, function well because their bodies are able to restrict the light that falls on the medium (film or digital, it is the same concept). Unwanted light will ruin the film (unless of course, you’re Martin Scorsese and you’re shooting the last shot of “The Last Temptation of Christ”).

**10. What is a lens and what is its primary purpose?**

**Answer:** The lens is a collection of glass elements of various shapes that is mounted on a barrel (metal or plastic) which is then loaded on to the body of the camera. The primary purpose of a lens is to form sharp images of objects (or actors) on to the focal plane, where the medium (film/digital) is located. A lens has a focusing ring that allows the cameraperson to select any object that is in the field of view of the camera and focus on it.

**11. What is focal length and what does it affect?**

**Answer:** The focal length, in camera terms (and not technical/physics terms) is the field of vision for the camera operator/camera. This is a function of the lens. In a Nikon “zoom” lens, for example, there might be a range of 18-105mm. Placing this zoom lens at 18mm will give the camera double the field of view compared to placing it at 36mm. Similarly, placing the zoom lens at 105mm will give us a very narrow field of vision but will be able to close-in on the details of a far-off object. David Lean used a 400mm lens in the famous introduction shot of Sharif Ali in “Lawrence of Arabia”. His aim was to show a far-off object (Sharif Ali mounted on a horse) in the desert. Stanley Kubrick used a custom-made For “The Good, The Bad and The Ugly”, Sergio Leone with DP Tonino Delli Colli used a trick to capture Tuco’s running and the cemetery with the proper lenses: two cameras were tied to opposite ends of a pole. The camera with the wider-view lens (25mm) was used to frame the cemetery while the camera with the medium-view lens (75mm) was used to frame Tuco. The DP and crew ran with the actor, Elli Wallach and was able to capture both footages at the same time, which helped in editing, but more importantly, helped keep the “visual point of view” for the audience consistent with the character.

**12. What is controlled by the iris?**

**Answer:** The amount/intensity of light that falls on the media is controlled by the iris. This setting allows the image to be brightened or darkened. The iris/aperture/diaphragm is a ring of thin metal leaves. The leaves overlap each other to form a hole through which the light travels. The size of the hole is referred to as an f-stop. The smaller the f-stop, the smaller the amount of light that passes through the iris and the dimmer the image is. The bigger the f-stop, the greater the amount of light that passes through the iris and the brighter the image is. Stanley Kubrick in “Barry Lyndon” wanted to use natural candle light for some of the scenes in the historic biopic. Without the use of any external/artificial lights, the camera would have had to accommodate a lens with a very large iris. Kubrick used a customized lens (which was also used by NASA) with a 0.7 f-stop (f/0.7) to capture the natural candle-lit images beautifully. The beer/dining scene from “Barry Lyndon” is unforgettable because of this effect. No special effects: just special brains. Both 50mm and 35mm lenses were used. The lens is two time faster than the fastest lenses made even in the 1990s. The functionality of the iris controls the depth of perception. It isn’t just the brightness and dimness of the image. In in the case of “Barry Lyndon”, the depth perception was horrible. However, Kubrick was going for that. The time period in which “Barry Lyndon” was placed, indoor lights were all handled by candle-light. Candle-light can provide only so much depth perception. And that’s exactly what the specialized lens did for Kubrick. And the images were crisp and beautiful, even though they lacked the depth perception.

**13. What does the shutter control?**

**Answer:** The shutter controls the length of time that light is exposed to the medium (film/digital). This time is measured in fractions of a second. In digital cameras, shutter is a software while in film cameras, shutter is a physical device. In a motion picture camera, the standard shutter speed is usually 1/60th of a second. One incremental change of shutter speed is the equivalent of changing the iris one f-stop. For example, changing the f-stop from f-5.6 to f-8 is the equivalent of changing the shutter setting from 1/125th of a second to 1/250th of a second.

**14. In your own words, why is well executed sound important?**

**Answer:** Well-executed sound is important because it is extremely important for the audience to perceive the sounds of the characters and the sounds in the movie. Let’s discuss in visual terms briefly: if the image is too bright or too dim or too colorful or misaligned, it can still be passed off to the audience under the pretext of creative freedom. To be sure, even a small camera mistake is unnacceptable. However, it can be forgiven by the audience as long as the camera/picture recovers quickly. Now, let’s switch to audio terms: if the audio is not in sych in the lip movements of the characters, then the audience is not only disoriented but also, they will not forgive the movie! It will be pure amateur hour and not an auteur hour to have sound not properly synchronized with the action on the screen. Certain creative freedoms can be taken in sound too, but they are very brief: in “Traffic”, the character Robert Wakefield utters a few words off the screen. But immediately the audience recognizes the character because of the context set in the movie. Such creative freedoms with sound however, are rare. A movie with bad sound isn’t a movie. It’s better to make a silent movie with captions. Like “The Artist”. In addition to synchronizaton, there is a lot of ambient sound that needs to be cleaned out. It’s best to clean out this sound during product. Using the correct equipment and the proper crew is of ultimate importance in this case. In my sophomoric attempt at direction, I spent a lot of time with the DP to talk about field of view and hardly spoke to him about sound. We didn’t use external sound microphones. The resulting footage was almost unusable in terms of sound. The sound recording levels was also different in each room. It wasn’t equalized properly to account for the discrepancies in each room. The audience listening to the clip on the earphones were rudely mistreated. I am taking this as a big lesson to understand that sound is as important as images and visuals and will never make the mistake of assuming that sound will take care of itself.

**15. Who generally comprises a sound crew?**

**Answer:** The sound crew consists of a mixer, a boom operator and assistants. The sound equipment usually is rented from the mixer: recorder, boom mics, batteries and cables. The mixer also supervises the sound crew, determines the microphone placement and monitors the sound mixers during the takes, and makes adjustments to keep the sound levels within proper range.

**16. Why does the mixer need to make sure levels are kept within a proper range?**

**Answer:** Sounds that are recorded at too high of a level will be distorted in post production to fix. And sounds that are recorded at too low of a level will make the movie a silent movie, not a talkie! Plus, the entire experience will be disorienting to the audience. That’s why it is extremely important to keep the sound levels within proper range.

**17. What are the tasks of a sound assistant?**

**Answer:** Sound assistants have tasks ranging from attaching wireless mics to actors (and retrieving them after the actors leave the set), wrapping cables, changing batteries and doing whatever else the boom mic operator and the sound mixer want.

**18. What is time code used for?**

**Answer:** I have never used a time code in any of the shoots so far and am looking forward to using one soon. This is especially true given that the sound was completely unsynchronized during my first directoral attempt in the five-min video. Time code is a tool used for synchronizing the audio with the video. A sync signal is provided to the camera by the sound department so that the picture track is encoded with the sync reference information. It’ll enable the on-set digital imaging technician (DIT) to show the director what previous takes look and sound like. The same reference is also used by the editor to synchorize picture and audio for editing. Also, a sync signal is generated by the sound department for use on a wireless smart slate, which can be seen by the camera when the slate is “clapped” just prior to the director saying “action”. The rolling time code which shows on the picture track as the digital clock with hours, minutes, seconds and frames lets the DIT and the editor sync picture and audio to the frame ensuring perfect synchronization. In a bigger production with multiple cameras, a sync signal is provided to all the camera operators.