

## About Basic Exposure Control – ANSWERS

*The exact answers to some of these questions will depend on your camera (starred), how it works and how well it performs. Please use this as a guide to go and find out! Push the button a lot.*

1. Why would you **not** use your camera in full auto mode?

*When you want to control how your image looks.*

*When the subject lighting is too difficult for the camera's Auto settings (e.g. subject in shadow or backlit, subject very bright compared to surroundings). \**

*When you have a difficult subject to capture (e.g. fast moving, large or small depth of field needed)*

2. What is the ISO setting on your camera for?

*The ISO setting varies how sensitive the camera sensor is.*

*Lower ISO (smaller number) increases the amount of light needed to capture the image.*

*Higher ISO (larger number) decreases the amount of light needed to capture the image.*

3. Why would you use a high ISO setting (e.g. ISO 800 or more)?

*So that you can use faster shutter speeds (e.g. to capture motion or stop camera shake).*

*So that you can use smaller apertures (to increase depth of field)*

4. What are the disadvantages of using a high ISO setting?

*Can degrade image quality (sensor noise increases).*

*May prevent you from using large apertures to limit depth of field.*

5. What is sensor noise and what does it look like?

*The captured image has 'speckles', normally most visible in dark areas. \* The ISO at which this becomes noticeable depends on the camera.*

6. Why would you use a low ISO setting (e.g. ISO 100 or less)?

*To get the best possible image quality (see 5).*

*To allow you to use long exposures (e.g. to blur waves).*

*To allow you to use large apertures (to limit depth of field)*

**Try this – use your camera to find out how the image quality changes as you raise and lower the ISO setting.**

7. Why would you use a fast shutter speed?

*To stop motion.*

*To reduce camera shake (especially when using a long lens).*

8. What are the disadvantages of using a fast shutter speed?

*To get the correct exposure you will have to use one or more of the following: Good light, large aperture, high ISO setting.*

*You will not be able to deliberately capture blur.*

9. What are the disadvantages of using a slow shutter speed?

*To get the correct exposure you will have to use one or more of the following: Low light, small aperture, low ISO setting.*

*You may get a blurred image, due to camera shake or subject motion.*

10. What does the aperture setting do (also known as the 'stop' or 'f stop')?

*Controls the amount of light the lens allows to get to the sensor.*

11. Does f2 let in more or less light than f16?

*More (6 'stops').*

12. Why would you use a small aperture (large f number)?

*To get large depth of field.*

*To enable you to shoot in bright conditions or with a slow shutter speed.*

13. Why would you use a large aperture (small f number)?

*To get small depth of field.*

*To enable you to shoot in dark conditions or with a high shutter speed.*

**Try this – find out the largest and smallest your lens apertures can be set to. Does the largest aperture change with the focal length of your lens?**

14. What is a correct exposure? (Bit of a trick question!)

*One that gives you the image you want.*

*This is why Auto does not always work. Say you wanted to create a silhouette – the camera will try and give you a middle of the road exposure or expose for the subject (this depends on the camera) whereas you actually need to expose for the background. Or the subject is in shadow and you don't mind the background being too bright in which case you need to expose for the subject.*

**Try this – in Manual exposure mode, use your camera to find out what the exposure should be (there will be a display in the viewfinder).**

**Try this – in Manual exposure mode, take photos at + and – 1,2,3 and 4 stops and look at the effect on the image and on the histogram.**

## **About Focussing**

15. What is Depth of Field, why is it important and how do you control it?

*Depth of field (DoF) is the front-back portion of the subject that is rendered in-focus.*

*You need to control it so that you get the image you expect. For example, when taking a photo of a group of friends, using a large aperture may mean that part of the group is out of focus.*

*DoF is controlled by the aperture but also depends on: Lens focal length, distance from the camera and sensor size.*

16. Why might a picture be blurred?

*Camera shake (especially with long lenses).*

*Subject movement (some parts of the image may be sharp).*

*Incorrect point of focus.*

*Using image stabilisation whilst camera is on a tripod (minor).*

17. What is the bokeh?

*Bokeh (a Japanese term, and very subjective) is the quality of the out of focus area of an image.*

**Try this – use your camera to find out how the depth of field of the image changes as you use smaller and larger f stops.**

18. What autofocus modes does your camera have and what do these modes do? \*

*Usually - as a minimum;*

*Manual – use controls to focus lens*

*AF(S) focus on half press and hold*

*AF(C) focus continuously whilst shutter release button half pressed*

*Selectable focus points – selected, centre, limited AF zone....*

*Some may also have focus tracking, eye recognition, capture in focus....*

19. How do you switch your camera to manual focus? \*

*Depends on your camera and lens – time to find out!*

20. Why would you **not** want to use autofocus?

*When Autofocus is not giving selecting the point of focus you want.*

*When Autofocus will not work due to the subject lighting or the subject is very uniform (needs contrast to operate).*

*When Autofocus would find it difficult to settle fast enough. Use Manual pre-focus and shoot when subject reaches that point (e.g. when a horse is jumping a fence focus 0.5m past the fence).*

*When using creative focus (for example to deliberately put part of the image out of focus).*

*When doing a 'joiner' or series of similar photos.*

## Other Things

21. Why would you use anti-shake, and when would you not use it?

*All of the time so long as the results are good.*

*Not when on a tripod as it could make things worse.*

22. Why would you use a tripod (3 reasons)?

*Long lens*

*Long exposure/poor light*

*Repeatability*

*Fine composition*

*Macro or close work*

23. If you are using a tripod, what is the best way to release the shutter?

*Cable or wireless release.*

*Self timer (not easy for changing subject)*

24. Name 3 simple things to look out for when composing a photograph.

*Rule of thirds*

*Leading lines*

*Intrusions around the edges*

*Framing (e.g. trees)*

*Rubbish*

25. What exposure modes (e.g. Auto, Program, Manual) does your camera have, and what do they do? \*

*Typically:*

*Auto – camera controls everything – general low importance shooting in ‘normal’ conditions.*

*Program – camera controls most things, but you set the ISO (or ISO range allowed) and can vary the shutter speed, (aperture) and the camera will change the aperture (shutter speed) to keep the correct exposure. As Auto but you can vary things a bit on a shot by shot basis.*

*Manual – you set the ISO and set the Aperture and Shutter Speed controls using the camera’s light meter display. Best for creative use and difficult situations (e.g. close-up) when quick shooting is not needed.*

*Av – Aperture priority – you set the ISO (or ISO range allowed) and aperture, the camera sets the shutter speed. Good for landscapes, group photos – anything that needs consistent control of DoF.*

*Tv – Time priority – you set the ISO (or ISO range allowed) and shutter speed, the camera sets the aperture (good for landscapes). Good for action shots or when using long lenses so that camera shake is minimised.*

*X – Flash – limits the camera shutter speed to allow flash synchronisation (typically about 1/250th for cameras with a focal plane shutter. Flash photography.*

*B – Bulb – Push the shutter release and the shutter opens, release and it closes. You set the Aperture and ISO. Use for very long exposure where your camera speeds are not long enough.*

*Sv – Sensitivity Priority – forces the camera to use this sensitivity and the camera sets Aperture and Shutter Speed. Use when you need to quickly switch to an extreme ISO (for example set to high IOS and use when you are shooting landscape and want to capture a moving animal you have spotted).*

26. When would you use these modes?

*See above*

27. What are the differences between Evaluative Metering, Center Weighted Metering and Spot Metering?

*Evaluative – uses the camera’s computing power and stored ‘ideal’ models to set the ISO, Aperture and Shutter speed (depend on the exposure mode in use).*

*Centre weighted – simple, old version of Evaluative. Assumes that the centre of the image is to be correctly exposed then modifies this by assessing the area immediately surrounding the centre of the image and ‘weightin’ the exposure accordingly.*

*Spot – measures from a small area of the image (usually the centre). Useful when assessing the dynamic range of a scene to set exposure in contrasty lighting.*

### **A Bit More Advanced... Don't Worry If You Don't Know...**

28. What does white balance do, and why is it important?

*Light varies in hue (colour temperature) dependant on factors such as light source and time of day. Our eyes naturally compensate so we don't notice the wide range of differences. The camera sensor cannot do this but the camera software can – in Auto White Balance it assesses the scene and ‘corrects’ the colours in JPEG files and the camera display (in RAW it sores the correction so that software can apply this later). Without these corrections, displayed and printed images would look quite strange!*

29. What is lens flare, and how could you prevent it?

*Lens flare happens when a bright light source strikes across the lens causing internal reflection and refraction in and between the lens elements (stopping this is one of the reasons modern lenses are coated). The effect is not only the recognisable hot-spots on the image but also a loss of clarity in the image.*

*To stop lens flare you can...*

*Not point your lens at bright light sources.*

*Shield the lens from light source using something to create a shadow (a hand, a book).*

*Stand in a shadow to take the photograph.*

*Use a lens hood to minimise the angles from which bright light sources can strike across the lens.*

30. What effect does changing the recorded pixels (sensor resolution) have?

*The camera software interprets the RAW data from the sensor to create a JPEG file. The smaller you set the JPEG size, the fewer pixels will be created by the camera so the smaller the image file will be and the maximum size of the image you can display or print without losing quality will be reduced. (This does not apply to images saved as RAW).*

31. What effect does changing the JPEG quality setting have?

*The camera software interprets the RAW data from the sensor to create a JPEG file. The lower you set the JPEG quality, the more the software will compress the data; to do this it makes assumptions about how it interprets adjacent pixels. Low quality JPEGs can suffer from what are called artefacts (where the software has made a mistake), reducing image quality. (This does not apply to images saved as RAW).*

32. What is RAW?

*RAW is the data taken straight from the camera sensor and is always associated with additional information such as the prevailing White Balance as assessed by the camera. This allows external software (such as Adobe Bridge, Lightroom, Elements and other proprietary and third-party software) to interpret the data and create prints and other viewable file types (such as JPEG, TIFF, PNG).*

33. What are the advantages of shooting RAW?

*No errors introduced by the camera software (e.g. JPEG compression artefacts).*

*More data to work on, so better-quality finished images.*

*Wider dynamic range (range from black to white) saved.*

*White Balance etc. can be changed later.*

34. What are the disadvantages of shooting RAW?

*Much bigger files so slower transfers and more storage space needed.*

*Must have an external application to be able to see and work on the images.*

*Proprietary file structure which could be superseded. This means that old images may not be readable in the future. Consider switching to Adobe DNG as a universal standard – most cameras support this.*

35. What does the histogram show you?

*The histogram is a graph that shows the relative number of pixels vs. brightness, from full black on the left side to full white on the right.*

*You can also show this information for Red, Green and Blue (the 3 colours that make up the sensor array), however interpreting this is somewhat beyond this quiz!*

36. How can a histogram help you?

*A histogram can help you see whether your exposure is OK but see 39!*

37. What does a good histogram look like (another slightly trick question!)

*The shape of the histogram depends on the image, so for a correctly exposed 'normal' image (say a bright day with light clouds) the shape would be a smooth curve which does not quite touch the left and right ends of the graph.*

*Pixels hard up against the left of the graph mean that some areas of the image are fully black (blocked in and, so areas of these contain no detail).*

*Pixels hard up against the right of the graph mean that some areas of the image are fully white (burnt out so areas of these contain no detail).*

*BUT in, for example, a silhouette you want the silhouetted shape to be all black, and therefore want some, perhaps a lot, of pixels to be hard against the left of the graph. And in a high key picture (such as a white background portrait), you want a lot of pixels to be hard against the right of the graph.*

*Histograms are fantastically useful so it will help your photography if you understand them. The best way to do this is go out and shoot challenging situations and see how the histograms look, then play with the camera settings to see what this does.*

38. Your camera meter tells you that the exposure it has measured is  $1/125^{\text{th}}$  sec at an aperture of f8. If you decrease the shutter speed from  $1/125^{\text{th}}$  sec to  $1/250^{\text{th}}$  sec, to get the same exposure would you change the aperture to f11 or to f5.6?

*By halving the exposure time you reduced the light by 1 stop, so you need to compensate by allowing twice as much light through the lens – you need to open the aperture by 1 stop from f8 to f5.6.*

39. You are photographing a horse galloping across a field on a sunny day. What would be the best settings to use, and why:

- a. ISO 100, F22,  $1/60^{\text{th}}$  sec
- b. ISO 100, F8,  $1/500^{\text{th}}$  sec
- c. ISO 400, F16,  $1/500^{\text{th}}$  sec
- d. ISO 400, F8,  $1/2000^{\text{th}}$  sec

*You need to freeze the motion, so a high ISO will allow you to use a fast shutter speed, as will opening the aperture a bit, so d is the answer BUT there is another way. Pan the camera and use a, this will mostly stop the motion of the horse, but you will get a blurred background implying motion.*

*I hope you enjoyed the quiz, and learnt about your camera as you tried it!*