(1) When a monochromatic light passes through a prism, will it show dispersion?

ans→ Monochromatic light is a light which is purely of single colour.

→ If a monochromatic light is passed through prism, then dispersion will not occur, ~~instead~~ it will deviate in a normal way as light bends. This is because any monochromatic light donot contain its components therefore it cannot disperse.

(2) Will a star appear to twinkle if seen from free space? (say moon).

ans→ A star twinkles as the density of atmosphere is not uniform as it goes on decreasing with the distance from the Earth. The ray coming from distant stars gets refracted due to the variation of densities.

→ In free space, the atmosphere is totally not present to refract the light. Therefore, twinkling cannot be seen in free space.

③ Can a beam of white light when passed through a hollow prism give spectrum ? Explain.

ans → When the prism through which the light will pass is hollow, then inside the prism there is air.

→ Dispersion of light cannot occur on passing through air.

→ Dispersion takes place because refractive index of different colour is different for a medium.

→ When white light travels from air to air, refractive index remains same and hence no dispersion occurs.

→ Therefore, spectrum will not form.

④ What do you mean by pure spectrum ?

ans → a spectrum in which the dispersion is highly discriminative so that at each point the light is practically monochromatic is pure spectrum.

⑤ What is the relationship between u, v and f in case of spherical mirror ?

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ans → In case of spherical mirror -

u = object distance from Pole
v = image " " "
f = focal length " "

Relation between them is -

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

⇒ It is also known as mirror formula.