Answer Page: Section A

1. (a) 12
   (b) Lie in the habitable zone

2. (a) AB Aurigae, protostar
   (b) D
   (c) 28

3. (a) Transit
   (b) Planet-to-star radius ratio

4. (a) 2, Barnard 68
   (b) 11, M47 (Orion Nebula)

5. 11,9,3,14,1

6. (a) Brown dwarf
   (b) K,F
   (c) 21,27
   (d) Patchy clouds

7. (a) HD 95086
   (b) Direct imaging
   (c) 29

8. (a) HAT-P-11b
   (b) Transmission spectroscopy
   (c) 26

9. (a) 24
   (b) B

10. D,E,B,K,F

11. (a) Brightness temperature for a range of wavelengths
    (b) WASP-43b

12. (a) 15
    (b) Scattered outwards by interactions with other planets or nearby star

13. (a) 55 Cancri
    (b) O,H
19. (a) M
   (b) Longest main-sequence lifetime

20. (a) M
   (b) Shorter orbital period, higher transit probability
   (c) Shorter orbital period, higher stellar radial velocity

21. (a) M
   (b) UV
   (c) Flaring

22. (a) M
   (b) Smaller disk masses

23. (a) More metal-rich disks can more easily create the cores
      of giant planets which then accrete gaseous envelopes
   (b) H, He
   (c) Core accretion, the bulk of the planet’s mass is gaseous
      and hence increases in mass past that of the core is due to gas, not solid accretion

24. (a) $1 \pm 0.2$ AU
   (b) $0.14 \pm 0.05$ AU
   (c) $28.5 \pm 5$ Days
   (d) $6.6 \pm 1$ Times
   (e) $1.8 \pm 0.5$ Times
   (f) 20 Parsecs
   (g) $54.8 \pm 10$ Times
   (h) Star B! One can perform many repeat measurements
      and beat down the signal to noise that way rather than simply through a stronger signal.