Team name: KEY Team number: KEY

Answer Page: Section A

1. (a) B
   (b) A
   (c) F
2. (a) D
   (b) A
   (c) C
3. (a) Blue
   (b) C
   (c) Dust in disk re-radiates in Infrared
4. (a) A8
   (b) A5
   (c) A4
   (d) A7
   (e) A6
5. A15, A19
6. (a) A10
   (b) Protoplanetary Disk
7. (a) A16
   (b) Two
8. D, A17
9. A20
10. (a) A14
    (b) CoRoT-2
11. (a) A11
    (b) Strong outbursts
12. (a) A9
    (b) Less
13. (a) A12
    (b) Brown Dwarf, Planet
14. (a) A13
    (b) Direct imaging
15. (a) A18
    (b) Flare star (eruptive variable)
16. (a) $0°, 0°$
    (b) Winds moving hot air eastward
17. (a) HD 189733b
    (b) Colder
18. (a) GJ 1214b
    (b) It has clouds/haze in its atmosphere
19. (a) Kepler-7b
    (b) It has clouds in the bright region

Team name: KEY Team number: KEY

Answer Page: Section B

20. D

21. A

22. Secondary Eclipse depth

23. Minimum mass, because one needs to account of the (unknown) inclination of the system.

24. (a) 0.041 AU
    (b) 149 km/s
    (c) 0.495 Jupiter Masses
    (d) 1.20 g/cm^3

25. (a) B
    (b) D
    (c) 2.49 %
    (d) 1.21 Jupiter Radii
    (e) 7240 Seconds

Team name: KEY Team number: KEY

Answer Page: Section C

26. (a) 10 Parsec
    (b) 3520 Kelvin
    (c) M2
    (d) 280 Kelvin
    (e) Yes, it is habitable, at 1 atm surface temperature needs to be between 273 and 373 Kelvin
    (f) Weaker, more Infrared radiation incident than for Earth so more absorption of incoming radiation
27. (a) C4
    (b) C5
    (c) C3
28. (a) 13.9
    (b) 1770
29. (a) B
    (b) 2.38 g/cm^3
    (c) 0.926 Solar Masses