

Snowyew's Astronomy Test KEY

Theory

1. Jupiter
2. M, L, T, Y
3. Li generally present in brown dwarves but not in low mass stars; older brown dwarves sometimes cool enough to gather observable quantities of methane (Gliese 229b); main sequence stars cool, but can still sustain steady fusion and emit heat/light whereas brown dwarves cool + darken steadily over their lifetimes (sufficiently old brown dwarves too faint to be detectable); some brown dwarves have iron rain as part of their atmospheric convection processes
4. 75-80 Jupiter masses
5. Astronomical process that occurs when the surface of a star or a planet cools. The cooling causes a drop in pressure and the star/planet shrinks as a result. This compression in turn heats up the core. Jupiter + Saturn
6. The planets were thought to be formed further away and migrated inwards over time
7. Lithium
8. Irregular
9. Molecular
10. T
11. F; Bok globules are a type of ABSORPTION nebulae
12. F; they are theoretical ONLY
13. F; Population I is located in center of galaxy; Population II is located near outer edge
14. T
15. F; main sequence stars contract when their temperature drops, thus increasing their temperature and expand when their temperature rises, thus decreasing their temperature; this process acts as the star's thermostat and regulates the temperature of the star to a manageable level
16. Young
17. Massive
18. High
19. Globular
20. HI region collide with expanding ionized gas (such as HII region) which glows brighter
21. Intense
22. UV light/rays
23. Supernovae; stellar winds
24. Compresses
25. Protoplanetary disk
26. collapse
27. Sweep up/ accrete/ absorb
28. More
29. "planetesimals"
30. Fewer
31. Larger
32. Debris
33. Nebular Hypothesis
34. 90

Calculations

35. 6.14 °C; yes
36. $a_y = \frac{\sqrt[3]{7}}{7} a_x$
37. 137 solar masses
38. 778000AU
39. 74.6 solar luminosities; 2.87×10^{28} Watts
40. [Wein's law]
 - a. 179nm
 - b. 81x
41. Newton's law of gravity
 - a. 8.95m/s^2
 - b. 487N

Identification

42. Fomalhaut
43. Piscis Austrinus
44. It is the brightest in the constellation
45. Several
46. Fomalhaut b; visible
47. Wider than usual orbit, orbit crosses debris clouds, surrounded by a free-floating dust cloud, has a highly eccentric orbit, bright in visible light images but dim in infrared images, planet's orbit might not be in the same plane as debris disk
48. Dust cloud; light from the collision of 2 large bodies in the debris disk of Fomalhaut
49. less
50. M20
51. Open cluster of stars; emission nebula; reflection nebula; dark nebula
52. Trifid Nebula
53. "divided into 3 lobes"
54. Gliese 229b
55. Brown dwarf
56. Methane
57. Gliese 229
58. Coronagraph
59. Blocks out the light of the star near the object to detect dim objects
60. Brown dwarves are extremely dim and hard to detect esp. near bright objects
61. FU Orionis Outburst
62. Thermal instabilities in the inner portions of the accretion disk initiates the outburst and the young star increases its luminosity
63. Pre-main sequence
64. Extreme
65. Reflection
66. Beta Pictoris
67. Second
68. Pictor
69. Excess
70. Carbon