

2020 SSSS

R4TS test

Name- _____

Date - _____



- 1) When large galaxies of similar size come together, they become giant _____ galaxies.
 - a) Barred spiral
 - b) Spiral
 - c) Elliptical
 - d) Irregular
- 2) What attribute does a star's lifespan depend on ?
 - a) temperature
 - b) luminosity
 - c) mass
 - d) None of the above
- 3) If a core that contains 1.44 to 3 solar masses collapse, which process stops it from total collapse ?
 - a) Neutron degeneracy pressure
 - b) Gravity
 - c) Electron degeneracy pressure
 - d) All of the above
- 4) What is a difference of Neutron degeneracy pressure and Electron degeneracy pressure ?
 - a) Neutron degeneracy pressure is higher
 - b) Electron degeneracy pressure is higher
 - c) There is no difference
 - d) None of the above
- 5) The upper limit of neutron star mass is _____ .
 - a) 50
 - b) unknown
 - c) 25
 - d) None of the above

- 6) What force causes a cloud of dust and gas to collapse in the process of forming a star?
- weak nuclear force
 - gravity**
 - strong nuclear force
 - None of the above
- 7) What is the heaviest element low mass stars can fuse to ?
- Iron
 - carbon**
 - Hydrogen
 - None of the above
- 8) What is the highest element high mass stars can fuse to ?
- Iron**
 - carbon
 - Hydrogen
 - None of the above
- 9) On a HR Diagram what is plotted on the y axis ?
- Luminosity
 - absolute magnitude
 - apparent magnitude
 - Both A and B**
- 10) On a HR Diagram what is plotted on the x axis ?
- Spectral class**
 - Luminosity
 - apparent magnitude
 - Both A and C
- 11) Why is the lifespan of a high mass star shorter than the lifespan of a low mass star ?
- High mass stars burn their hydrogen faster**
- 12) Define Apparent Magnitude.
- Apparent Magnitude is the brightness of a celestial object from Earth**
- 13) Define Absolute Magnitude.
- Absolute Magnitude is the brightness of a celestial object 10 parsecs away from it**
- 14) If a core with a solar mass greater than 3 collapses what is the result ?
- A black hole**
 - A planetary Nebula
 - A white dwarf
 - None of the above

15) Identify the type of galaxy in the picture on the right.

Elliptical



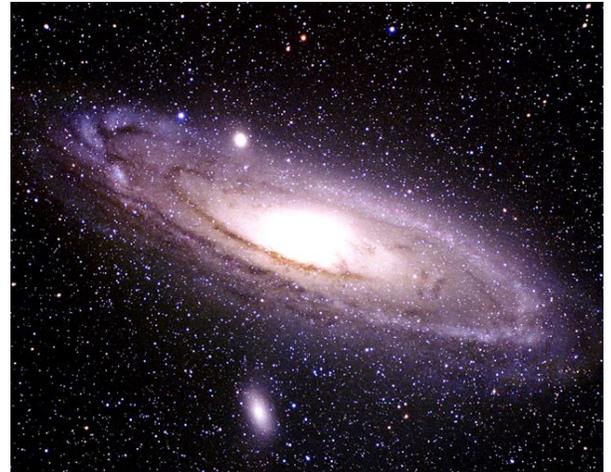
16) Identify the type of galaxy in the picture on the right.

Barred spiral



17) Identify the type of galaxy in the picture on the right

Spiral



18) Identify the type of galaxy in the picture on the right

Irregular



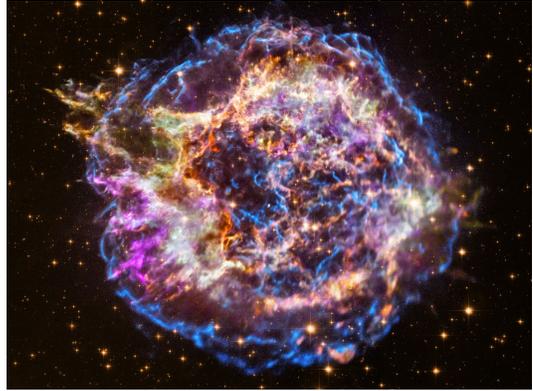
19) Which telescope is the picture on the right taken from ?

The ALMA telescope



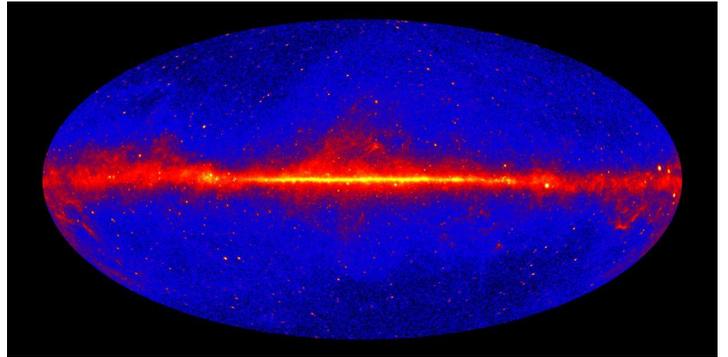
20) Which telescope is the picture on the right taken from ?

The Chandra telescope



21) Which telescope is the picture on the right taken from ?

The Fermi Telescope



22) Which telescope is the picture on the right taken from ?

The Hubble space telescope



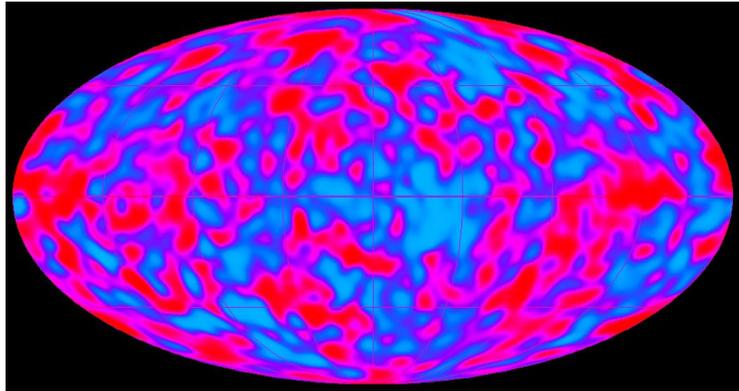
23) Which telescope is the picture on the right taken from ?

The Spitzer Space telescope



24) Which telescope is the picture on the right taken from ?

The COBE Telescope



25) What part of the electromagnetic spectrum does the Alma telescope use ?

- a) Gamma rays
- b) Radio waves**
- c) Microwaves
- d) None of the above

26) What part of the electromagnetic spectrum does the Chandra telescope use ?

- a) Radio waves
- b) X - rays**
- c) UV rays
- d) visible light

27) What part of the electromagnetic spectrum does the Spitzer Space telescope use ?

- a) Infrared rays**
- b) UV rays
- c) Radio waves
- d) X- rays

28) What part of the electromagnetic spectrum does the EUVE telescope use ?

- a) X -rays
- b) Microwaves
- c) Visible light
- d) UV rays**

29) What happens when a low mass star is depleted of hydrogen ?

Nuclear Fusion stops and Helium fusion starts to happen. The core contracts and then generates a Hydrogen burning shell, becoming a red giant.

30) What happens when a high mass star is depleted of hydrogen ?

It becomes a red supergiant.

31) Lower mass stars fuse Hydrogen to Helium using the CNO cycle.

- a) True
- b) False**

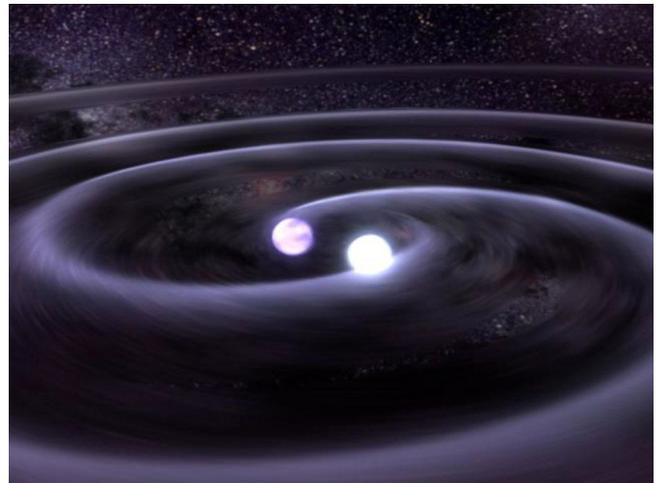
32) The CNO cycle uses Carbon, Nitrogen, and Oxygen.

- a) True**

Pg 5 b) False

- 33) High mass stars also experience Helium flash.
a) True
b) false
- 34) Neutron stars have a mass of about 1.4 times our sun.
a) True
b) False
- 35) The sun is a yellow dwarf.
a) True
b) False
- 36) The spectral sequence of stars runs _____ .
a) FGKOMAB
b) KMOGFBA
c) ABFGKMO
d) OBAFGKM
- 37) What is the sun's spectral type?
a) G2V
b) G0V
c) G3V
d) None of the above
- 38) What do red dwarfs with a solar mass of about 0.25 evolve to ?
a) A red giant
b) A Red supergiant
c) A neutron star
d) None of the above
- 39) What color are Class O stars ?
a) Purple
b) Blue
c) Orange
d) Yellow
- 40) What type of celestial object is in the picture on the right ?

Binary stars



Directions for 41 - 48 , match each type of star to its Yerkes Spectral Classification

- | | | |
|--------------|------------|-----------------------|
| 41) Type Ia | <u> C </u> | A) Bright Giants |
| 42) Type Ib | <u> E </u> | B) White Dwarf |
| 43) Type II | <u> A </u> | C) Bright Supergiants |
| 44) Type III | <u> F </u> | D) Main Sequence |
| 45) Type IV | <u> G </u> | E) Normal Supergiants |
| 46) Type V | <u> D </u> | F) Normal Giants |
| 47) Type VI | <u> G </u> | G) Sub-Giants |
| 48) Type VII | <u> B </u> | H) Sub- Dwarf |

49) If Star A and Star B has the same mass but Star A has a higher temperature, which star has a higher luminosity?

- a) Star A
- b) Star B

50) Which constellation is visible all year round.

- a) Ursa Major
- b) scorpius
- c) Orion
- d) None of the above

51) How many stars do open clusters have ?

- a) A few hundred
- b) A few thousand
- c) A few million
- d) All of the above

52) Type Ia supernovae almost always have the same absolute magnitude.

- a) True
- b) False

53) Two stars with the same temperature always have the same luminosity.

- a) True
- b) False

54) In the northern hemisphere, during the winter the constellation scorpius is visible

- a) True
- b) False

55) Polaris is known as the north star.

- a) True
- b) False

56) Globular clusters have diameters of up to 1000 light years.

- a) True

Pg 7 **b) False**

57) Vega is a type K star

- a) True
- b) False

58) About 90% of stars in the Universe are Main sequence stars?

- a) True
- b) False

59) Identify the celestial object to the right



Rigel

60) Which constellation is it part of ?

Orion

61) Identify another celestial object in the same constellation

Betelgeuse

62) Identify the celestial object to the right



Spicas

63) Which constellation is it part of ?

Virgo

64) Identify another celestial object in the same constellation

M60

65) Identify the celestial object to the right

M101



66) Which constellation is it part of ?

Ursa Major

67) Identify another celestial object in the same constellation

Alcor

68) What constellation is on the right?

Corvus

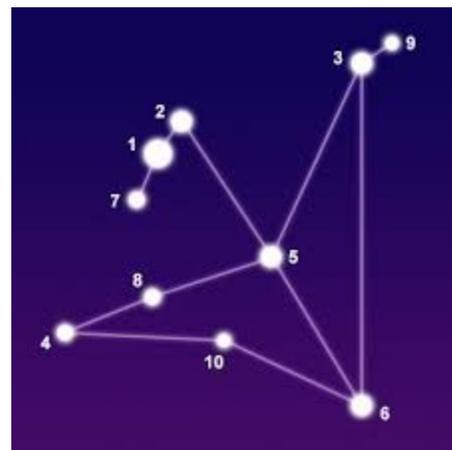


69) What animal is associated with this constellation?

The crow

70) Which constellation is on the right?

Aquila



71) What animal is associated with this constellation?

Pg 9

The Eagle

72) What is another name for M104 ?

The sombrero Galaxy

73) A star has a luminosity of 5.8×10^{35} and is 2.5×10^{20} m away from Earth, what is its apparent brightness ?

$$B = L / (4\pi d^2)$$

$$B = 5.8 \times 10^{35} / (4\pi (2.5 \times 10^{20})^2)$$

$$B = 1.85 \times 10^{11} \text{ W/m}^2$$

74) A star is 0.5 parsecs away from earth, what is its Parallax angle in mas (milliarcsecond) ?

$$D = 1/P \quad 2 \text{ arcseconds} = 2,000 \text{ mas}$$

$$0.5 = 1/P$$

$$0.5P = 1$$

$$P = 2$$

75) A star with an apparent magnitude of 76 is 10^9 megaparsecs away. What is the absolute magnitude of this star ?

$$m-M = 5 + 5 (\log (D))$$

$$76 - M = 5 + 5 (\log (10^9))$$

$$M = 26$$