



Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27

MSc. Physics open elective - III SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in January-March 2022)

PHOE 9420 - Astrophysics

Time- 1 ½ hrs

Max Marks-35

This question paper contains two printed pages and two parts.

Part A

Choose the correct option for any 15 questions. Each question carries 1 mark.

- The number of galaxies estimated to be present in the known Universe is about
 - 100 million
 - 10 million
 - 100 billion
 - 100 trillion
- One tea spoon of material from a neutron star would approximately weigh about
 - 1 million kg
 - 1 billion kg
 - 5 billion kg
 - 5 trillion kg
- Which is the closest star to the Earth among these?
 - Proxima Centauri
 - Sirius
 - Canis Majoris
 - UY Scuti
- The number of Earths that can fit inside the Sun would be
 - 10000
 - 100000
 - 1000000
 - 100000000
- When the conclusion does not follow from the premises objectively, it is called _____
 - Deduction
 - induction
 - intuition
 - metaphysics
- Which among these are not the causes of things put forth by Aristotle.
 - Material cause
 - Final cause
 - intial cause
 - Efficient cause
- Only 4% of the known universe is made of _____
 - Luminous matter
 - Dark matter
 - Dark energy
 - Ether
- What is the name of the rocket that launched the world's most powerful telescope?
 - Apollo 52
 - Adriane 5
 - Ariane 5
 - Artican 9
- At What distance will James webb Telescope be orbiting from the Earth?
 - 150,000 km
 - 15 000 km
 - 1.5 million km
 - 15 million km
- What is the end stage of a star very much massive than sun?
 - Supernova
 - Black hole
 - While dwarf
 - Brown dwarf
- The total number of stars in the observable universe is about _____
 - 100 billion
 - The same as the number of grains of sand on all the beaches on earth
 - The same as the number of grains of sand in a large 1 meter cube box
 - The same as the number of atoms that make up the earth

12. _____ are used to see through cold dense gases and clouds in space.
 a. infrared rays b. X rays c. Gamma rays d. UV rays
13. What was the source of noise that Karl Jansky discovered which interfered with the wireless telephone network?
 a. Jupiter b. Sun
 c. Source outside the galaxy d. source outside the solar system
14. Which among these is a trans-Neptunian object in our solar system?
 a. Io b. Charon
 c. Ganymede d. Europa
15. If an object reaches the speed of light, its length changes to
 a. Infinite b. Double of the value
 c. Half of the value d. Zero
16. A white dwarf will eventually cool down forming this hypothetical object.
 a. Black dwarf b. Brown dwarf
 c. Red dwarf d. black hole
17. Lightyear is a measure of _____
 a. Speed b. time
 c. Distance d. light
18. If you had something the size of a sugar cube that was made of neutron star matter, it would weigh _____
 a. As much as the entire Earth b. As much as a truck
 c. About 50 pounds d. As much as a large mountain
19. What is the diameter of the primary mirror of our college telescope?
 a. 10 inch b. 8 inch c. 12 inch d. 14 inch
20. What is the greatest obstacle according to Astro biologist Paul Davis in explaining the origin of the universe?
 a. Origin of matter b. origin of space c. origin of life d. origin of time

PART – B

Answer any THREE QUESTIONS. Each question carries 5 marks. [3 x 5 = 15]

21. Explain Aristotle's four causes with an appropriate example
22. Explain the law of cause and effect and its relation to the origin of the Universe.
23. What are the different kinds of optical telescopes? Explain with diagrams.
24. Write a note on how our understanding of the nature of light has evolved through the ages.
25. In the sci-fi movie Interstellar, Cooper is drawn into a supermassive blackhole and has access to higher dimensions, He tries to communicate with his young daughter to change the past. Comment briefly on the logical conundrums involved in the entire climax of the movie.

PART – C

This is a compulsory question. This question carries 5 marks.

26. In about 150-200 words write about your journey through the cosmos in the CBCS course.