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RAN-2103000206030067

B.Sc. (Sem. VI) Examination March - 2025

Physics (Elective) - II

Astrophysics - II — Elective - II (ID)

[Total Marks: 50

સૂચના : / Instructions

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નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the details of signs on your answer book

Name of the Examination:

B.Sc. (Sem. VI)

Name of the Subject :

Physics (Elective) - II Astrophysics - II — Elective - II (ID)

Subject Code No.: 2103000206030067

Seat No.:

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Student's Signature

- (2) Draw neat diagrams wherever necessary.
- (3) Symbols used in the paper have their usual meaning.
- (4) Figures to the right indicate full marks of the question.
- (5) Scientific calculator may be used.

Q-1. Answer the following questions in brief :

(10)

1. What is the primary product of hydrogen fusion in the Sun?
2. State the Chandrasekhar limit
3. What happens to a white dwarf over time?
4. Which basic observed quantities in stars do not significantly vary even over longer periods of time?
5. What happens to time near a black hole's event horizon?
6. State Hubble's law.
7. Describe any two properties of black hole.
8. Provide the full form of QuaSaRS?
9. State the full form of OVVs.
10. Can a white dwarf support life?

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- Q-2. (A) Answer any one the following questions in detail. (6)**
- (1) How does the existence of white dwarfs help us understand the end stages of stellar evolution? Discuss their significance in astrophysics, including their role in binary systems and supernovae.
 - (2) Discuss the equation of State for Stellar Interior.
- Q-2. (B) Answer any one the following questions in brief. (4)**
- (1) Draw the evolution tracks of post-main sequence stars of different masses on the H-R diagram.
 - (2) Discuss the Solar Neutrino puzzle.
- Q-3. (A) Answer any one the following questions in detail. (6)**
- (1) Describe the process by which a stellar-mass black hole is formed. Include the role of a supernova explosion and the conditions necessary for its creation.
 - (2) Write a short note on discovery of Pulsars.
- Q-3. (B) Answer any one the following questions in brief. (4)**
- (1) With the appropriate diagram, discuss the primary pulse and secondary pulse of a typical pulsar.
 - (2) Describe the rotating Neutron star model of Pulsars in detail.
- Q-4. (A) Answer any one the following questions in detail. (6)**
- (1) Explain what is meant by gravitational red shift and cosmological red shift. Also explain that why the redshifts of Quasars are cosmological origin?
 - (2) Explain the Radio properties of Quasars in detail.
- Q-4. (B) Answer any one the following questions in brief. (4)**
- (1) Write a short note on Active Galactic Nuclei.
 - (2) Describe on “Seyfert Galaxies and N Galaxies.
- Q-5. (A) Answer any one the following questions in detail. (6)**
- (1) Discuss the law of Red-shift and the expansion of the universe.
 - (2) Write a short note on Cosmic Microwave Background Radiation

Q-5. (B) Answer any one the following questions in brief. (4)

- (1) What is Cosmology and why it's important to build cosmological theories?
 - (2) Draw the Schematic diagram showing universality of Hubble's law and provide its explanation.
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