UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

ONLINE END SEMESTER EXAMINATION
MAY 2021

Course: **ASTRONOMY AND ASTROPHYSICS** **Semester: VI**
Course Code: PHYS 3013
Programme: BSc (H): PHYSICS **Max. Marks: 100**
Instructions: Read the section headings carefully for Sections A, B and C **Total pages : 02**

SECTION A

1. Each Question will carry 5 Marks
2. Instruction: Complete the statement / Select the correct answer(s)

Q1	Match the following: i. Heliocentric — a. Jupiter ii. Europa — b. Uranus iii. Titan — c. Copernicus iv. Titania — d. Saturn v. Geocentric — e. Ptolemy	CO1
Q2	i. The Astronomers consider the stars to be approximate black bodies. The approximation helps them to determine the stars' surface _____ a) Pressure b) Volume c) Temperature d) Density ii. As the wavelength of the radiation decreases from the maximum, the intensity of the black body radiations _____ a) Increases b) Decreases c) First increases then decrease d) First decreases then increase	CO1
Q3	Match the following: i. First artificial satellite — a. Twinkling of stars ii. Not seen from Moon — b. Yuri Gagarin iii. Name of our galaxy — c. Sputnik iv. Looks reddish in night sky — d. Milky Way v. First person in space — e. Mars	CO1
Q4	Match the following: i. Triton — a. Aryabhatta ii. First Indian in space — b. Comets iii. First Indian satellite in space — c. Neptune iv. Founder of Indian space program — d. Rakesh Sharma v. Contain large amounts of ice — e. Vikram Sarabhai	CO1

Q5	Photons of energy 5.0 x 10^{-19} J are determined to be the cause of transitions observed in a stellar spectra. The frequency and wavelength of such photons are ……. and ……... respectively. (Given h = 6.626 x 10^{-34} Js).	CO1
Q6	Match the following: i. Rhea — a. Sun ii. Asteroids orbit the — b. Andromeda iii. Large Magellanic Cloud — c. Mercury iv. Galaxy closest to Milky way — d. Saturn v. Planet with orbit closest to Sun — e. Galaxy	CO1
SECTION B **1. Each question will carry 10 marks** **2. Instruction: Write short / brief notes**		
Q7	Considering the elements of Optics, what can be the major different types of telescopes? Explain your choices. [3 + 7]	CO1
Q8	If you could see all the galaxies in the sky then into how many different types would you be able to separate them? What would these classes be?	CO3
Q9	Chart in words, the evolution path of Sun like stars until their end.	CO3
Q10	Compare the 'Big Bang' and the 'Steady State' scenarios of the Universe.	CO4
Q11	What are QUASARS? Also, what are AGNs? Are they related? [4 + 4 + 2] OR Write a short note on CMB radiation.	CO4
Section C **1. Each Question carries 20 Marks.** **2. Instruction: Write long answer.**		
Q12	State the prominent theories for the formation of Solar System. Describe and analyze in detail all the salient features of the Nebula theory. [6 + 14] OR Picturize in words the temperature profile of the Sun, from the core to the surface. Analyze in detail and describe in your own words the structure of Sun. [6 + 14]	CO2