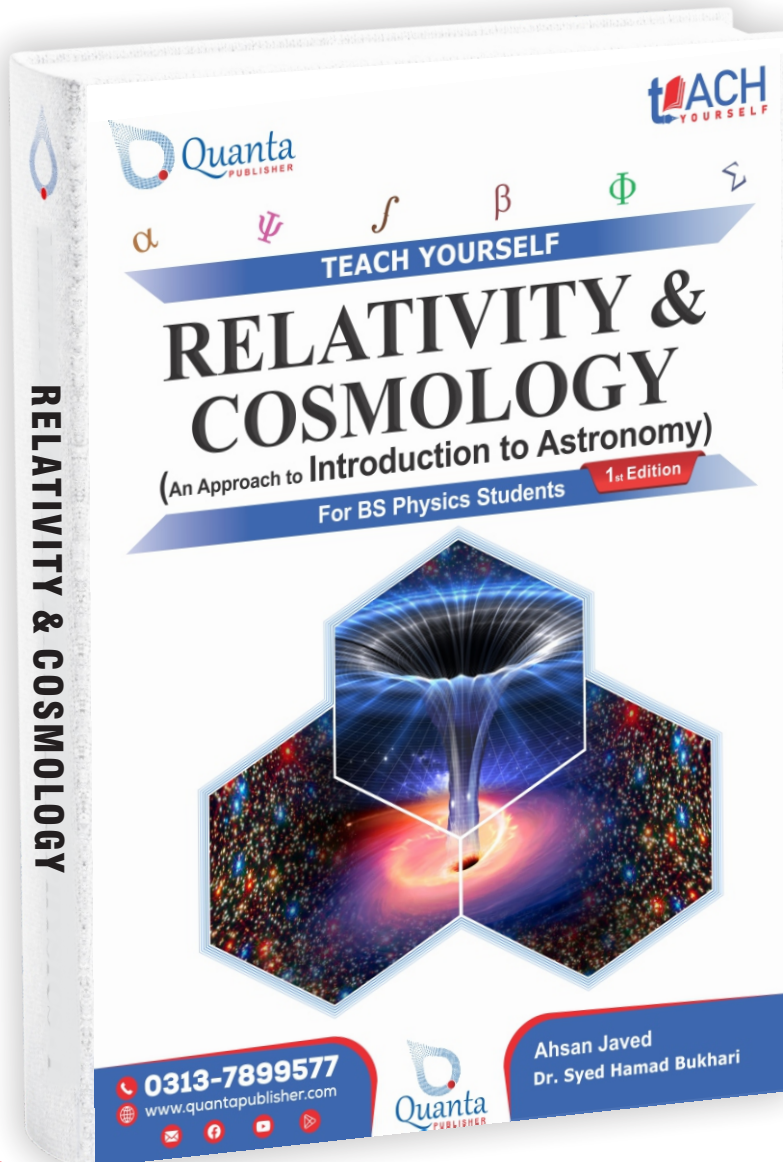




# PAST PAPERS

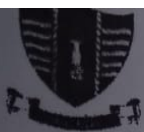


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# Govt. College UNIVERSITY, FAISALABAD

External Semester Examinations Fall-2022-2023

Roll No.: \_\_\_\_\_

Programme: BS Physics

Semester: 5<sup>th</sup>

Part: Subjective

Credit Hrs.: 3(3-0)

Course Code: PHY-509

Course Title: Relativity & Cosmology

Marks: 80

Time allowed: 2:30 Hours

**Note:** Attempt all questions. All the questions carry equal marks.

- |           |   |    |
|-----------|---|----|
| Q#II, a)  | Explain the Einstein's postulates of special relativity and Consequences of special relativity? | 10 |
| b)        | Write a note on Lorentz transformation?   | 6  |
| Q#III, a) | Write down the theory, deication and effects of Cerenkov radiation?                             | 10 |
| b)        | Explain Einsteins mass-energy relationship and its examples?                                    | 6  |
| Q#IV, a)  | How can we write a force equation in realitivity and rest mass?                                 | 10 |
| b)        | Write a short note about black holes?   | 6  |
| Q#V, a)   | What is general realitivity and the equivalence principle in detail?                            | 10 |
| b)        | Write a short summary about Cosmological red shift?   | 6  |
| Q#VI, a)  | Whats do you know about the conservation of mass of kinetic energy in uranium fission?          | 10 |
| b)        | Differentiate between pain production and annihilation?   | 6  |



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External Semester Examinations Fall-2022-2023

Roll No.: \_\_\_\_\_

Programme: BS Physics

Semester: 5<sup>th</sup>

Part: Objective

Credit Hrs.: 3(3-0)

Course Code: PHY-509

Course Title: Relativity & Cosmology

Marks: 20

Time allowed: 30 Minutes

Q # I	Encircle the correct one;	20
i)	The term "relativistic" refers to effects that are a) observed when speeds are near the speed of light. b) noticed about a moving object. c) observed when objects move backward in time. d) measured by stationary observers only.	
ii)	According to Einstein's Special Theory of Relativity, laws of physics can be formulated based on a) Inertial Frame of Reference b) non- Inertial Frame of Reference c) both non and Inertial Frame of Reference d) Quantum state	
iii)	Einstein's special relativity is based upon two postulates. The most radical of the two postulates states that a) the speed of light is finite. b) the classical velocity addition formula still holds at relativistic speeds. c) the speed of light is the same for all observers in all inertial reference frames. d) there is no ether surrounding the Earth.	
iv)	In Newtonian theory two events that are simultaneous in one inertial frame are simultaneous in every other inertial frame because there is a ..... absolute time. a) Single b) double c) triple d) none of these	
v)	'Black holes' refers to _____? a) Holes occurring in heavenly bodies b) Bright spots on the sun c) Collapsing object of high density d) Collapsing object of low density	
vi)	The equation, $x = a \cos(\omega t + \phi)$ represents a. Acceleration due to gravity b. Uniform straight line motion b. c. dc current d. Simple harmonic motion	
vii)	_____ transformation are replaced by the Lorentz transformation which confirms the postulate of relativity. a) Galelian b) Maxwell c) Plancks d) Newtons	
viii)	This value $9.1 \times 10^{-31}$ is represented the mass of _____. a) Electron b) Photon c) Neutron d) Muon	
ix)	In which year did Jim Parsons win The Best Actor in a Television Comedy Series for his role in The Big Bang Theory? a) 2000 b) 2009 c) 2011 d) 2012	
x)	If the linear momentum of a moving objects is doubled, then K.E will be a) Remain same b) increases by four times c) increases by two time d) increases by eight times	
xi)	If the K.E of a body is increased by 300% its momentum will increase by a) 100% b) 150% c) 200% d) 175%	
xii)	When was The Big Bang Theory premiered? a) 2007 b) 2009 c) 2008 d) 2010	
xiii)	A body at rest may have a) Energy b) Momentum c) Speed d) Velocity	
xiv)	Which of the following is Einstein's mass energy relation? a) $E_k = (m - m_0)c^2$ b) $E^2 - p^2 c^2 = m_0^2 c^4$ c) $E_k = mv^2/c^2$ d) $E = mc^2$	
xv)	Minkowski space or spacetime is used in mathematical physics and special relativity which combines ..... Euclidean Space a) 3-dimensional b) 2-dimensional c) 0-dimensional d) 1-dimensional	
xvi)	Black hole is defined by? a) A region in spacetime beyond which events cannot affect an outside observer b) A region of spacetime exhibiting such strong gravitational effects that nothing can escape from it c) A speculative structure linking separate points in spacetime d) none of these	
xvii)	Relative to its period on the earth, the period a pendulum on the moon is a. Shorter b. Longer c. The same as on the earth d. Varies with time	
xviii)	Big Bang theory explains.....? a) Origin of Universe b) Origin of Sun c) Laws of physics d) None of above	
xix)	The term "relativistic" refers to effects that are a) observed when speeds are near the speed of light. b) noticed about a moving object. c) observed when objects move backward in time. d) measured by stationary observers only	
xx)	In relativity an electric field and magnetic fields are _____ a) dependent b) independent c) interdependent d) null	

Govt. Postgraduate College of Science, Faisalabad.

Bs-Physics 5th Semester M/E Mid term examination

Course code: PHY-509 Time:- 60minutes

Course title:- Relativity & Cosmology Marks:-12

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Note:-Attempt all question

Q.1.State postulates of theory of Relativity. (1)

Q.2.Derive Lorentz Transformation Equations. (5)

Q.3.What is Light cone? Discuss its different regions. Why the world line of

Material particles always remain inside the light cone. (6)