

2020

Time : 3 hours

Full Marks : 60

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer any five questions in which Q. No. 1 is compulsory.

1. Answer any **three** questions of the following :
4×3 = 12
- (a) What are generalised co-ordinates ?
 - (b) Explain time dialation.
 - (c) What is Minkowski space.
 - (d) What is twin paradox ?
 - (e) What is light cone in relativity ?

UA – 11/2

(Turn over)

2. State Hamilton's principle. Obtain Euler-Lagrange's equations from this principle.
3+9 = 12
3. Deduce Hamilton's Canonical equations of motion and use it to obtain the time period of a simple harmonic oscillator. **12**
4. What are Poisson Brackets ? State and prove some of its properties. **8+4 = 12**
5. What are the postulates of special theory of relativity ? Deduce the Lorentz transformation equations. <https://www.jharkhandstudy.com> **12**
6. What are four vectors ? Define velocity and acceleration four vectors. **8+4 = 12**
7. Derive Lorentz transformation equation for an electromagnetic field. **12**
8. Derive Maxwell's equations in tensor form. **12**

9. What are Lieneard and Wiechert potentials ?
Find the expressions for electric field E
and magnetic field B of a charge in unifrom
motion. 3+9 = 12



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