



DRR-3213

B. Sc. (Sem. VI) Examination

March / April - 2016

Physics : Paper - VI

(Mechanics & Mathematical Methods)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य बपवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. SC. (SEM. VI)

Name of the Subject :
PHYSICS : PAPER - VI

Subject Code No. : 3 2 1 3 Section No. (1, 2,.....): Nil

Seat No. :

Student's Signature

- (2) Figures to the right indicate total marks carried by the question.
(3) All symbols used have their usual meaning.
(4) Students are allowed to use a non-programmable scientific calculator.

1 Answer in brief : 8

- (1) What is a Coriolis force?
- (2) What do you mean by precession in case of Foucault pendulum?
- (3) In which type of frame of reference do we get Pseudo forces?
- (4) Define rigid body.
- (5) What is a domain of a complex function?
- (6) What is an odd function?
- (7) Draw an Argand diagram for a complex number $Z = x + iy$
- (8) What is Fourier series?

2 (A) Answer any one in detail : 10

- (1) Discuss the motion of a body falling freely on the surface of the earth from a height. Derive an expression for its deviation because of the motion of the earth.

- (2) Explain angular momentum of a rigid body. Show that the angular momentum of a rigid body is not necessarily always in the same direction as the instantaneous axis of rotation.
- (B) Answer any one : 4
- (1) A body is falling freely from a height of 250m above the surface of the earth. Calculate the time of flight and displacement due to coriolis force at the north pole. (Take $g = 9.8 \text{ m/s}^2$)
- (2) A wheel that has a rotational kinetic energy of 24400 J when rotating at 602 *revolution/minute*. Calculate the moment of inertia of the wheel with respect to its axis of rotation.
- 3** (A) Answer any one in detail : **10**
- (1) Explain geometrical representation of the sum, difference and product of the complex numbers.
- (2) State and prove the condition for a function $f(z)$ to be an analytic.
- (B) Answer any one : 4
- (1) Prove that the modulus of the difference of two complex numbers is greater than or equal to the difference of their moduli.
- (2) Find the value of $\sum_{n=1}^{\infty} \frac{1}{n^2}$ using Fourier series.
- 4** Answer any two : **14**
- (1) Explain Newtonian principle of relativity.
- (2) Explain rotational kinetic energy of rigid body.
- (3) Define complex conjugate and explain its laws.
- (4) State and prove Dirichlet's theorem.
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