



JB-3096

B. Sc. (Sem. III) Examination
March/April – 2013
Applied Physics (Mechanics)
(New Course)

Time : Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दशांशिक निशानीवाणी विगतो उत्तरवही पर अवश्य कर्तवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. Sc. (Sem. 3)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Applied Physics (Mechanics) (NEW)"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="9"/> <input type="text" value="6"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) Question one is compulsory.
- (3) All questions are equal marks.
- (4) Draw neat diagram wherever necessary.
- (5) Scientific calculator can be used.

- 1 Answer the following questions in short as directed : 8
 - (i) What are normal co-ordinates and normal modes of a coupled system ?
 - (ii) What are forced vibrations ?
 - (iii) Distinguish between free and forced vibration.
 - (iv) Define quality factor and bandwidth of the sharpness of resonance.
- 2 (a) Describe an experiment for determining the moment of inertia of a flywheel. Derive the necessary formula. 8
- (b) A flywheel weight to tons and the whole of the weight may be considered as concentrated at a distance 3 ft from the axis. What is the amount of energy stored in the flywheel when rotating at a speed of 100 revolutions per minutes ? 6

OR

- 2 (a) Define moment of inertia. Calculate the moment of inertia of a thin disc about the axis normal to plane and passing through its center of gravity. 8
- (b) Write short note on Angular moment and Angular impulse. 6

- 3 (a) What do you understand by damped vibration ? Obtain an expression for displacement as a function of time for a damped oscillator. 8
- (b) Find whether the discharge of a condenser through the following components $C = 0.1 \mu\text{F}$, $L = 10 \text{ mH}$ and $R = 200 \text{ ohm}$, if the circuit is oscillatory, calculate its frequency. 6

OR

- 3 (a) Derive an expression for the velocity of a simple harmonic wave in a stretched string. 8
- (b) Show that the fundamental frequency of vibration of 6

a stretched string is given by $n = \frac{1}{2l} \sqrt{\frac{T}{m}}$.

- 4 (a) Describe the method of determining the velocity of sound by using a Kundt's tube. 8
- (b) Two open organ pipes of length 50 cm and 50.5 cm. produce 3 beats/second; calculate the velocity of sound in air. 6

OR

- 4 (a) What is resonance ? Explain through an experiment how this phenomenon is used to determine the velocity of sound in air. 8
- (b) Compare the length of an open end and closed end pipes which emit the same fundamental note. 6