

OR

fdl h , d l eku Bkl xkys ds dklj .k xq Roh; folko ds fy, 0; at d i klr dhft,] tcf d fcnq xkys ds ckj fLFkr gkA

Deduce an expression for gravitational potential due to an uniform solid sphere, at a point outside the sphere.

ç'u 2- n<+fi M dh xfr ds fy, ; wj l ehdj .k 0; Bi é dhft, A Derive Euler's equation of motion of a rigid body.

OR

tMRo vk?kwkz dks i fjHkP'kr dhft, , oafolko dh ead.k dh xfr dks l e>kb; A Define moment of Inertia and explain the motion of particle in potential well.

ç'u 3- fyLI ktw vkNfr; k D; k gkrh gA nks ijLij yæor- l jy vkorz xfr; ka ds l a kstu ftuds nkyu dkyka dk vuq kr 2% gS l s i klr xfr dk l ehdj .k i klr dhft, A

What are Lissajou's figures? Obtain the equation of motion due to superposition at of two mutually perpendicular simple harmonic motion whose time period are in the ratio 2:1.

OR

L-C ifji Fkka ds nkyu ka ds fy, vody l ehdj .k dh LFkki uk dhft, rFkk bl ds vkorzky dk l = 0; Bi uu dhft, A

Establish the differential equation for the oscillation of L-C circuit and deduce the expression for its time period.

ç'u 4- ijLij yæor fo | r p d h; (s-ka ead.k dh xfr dh foopuk dhft, A Discuss the motion of a charged particle in mutually perpendicular electric and magnetic field.

OR

jS[kd Rojd dh l j p u k r F k k f l) k r l e > k b ; A

Explain the construction and principle of linear accelerator.

ç'u 5- cdu vk?kwkz fdl sdgrsgA bl ds fy, , d 0; at d fuxier dhft, A What is bending moment? Deduce an expression for it.

OR

culyh i es dks fyf[k, , oaf l) dhft, A

State and prove Bernoulli's theorem.

Code No. : B-203(B)

Annual Examination - 2017

B.Sc. - I

PHYSICS

Paper - I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

Max.Marks : 50

Min.Marks : 17

Time : 3 Hrs.

Vhi % [k.M v* eanl vfry?kjkjh izu gA ftlgagy djuk vfuok; Z gA [k.M ^c* eay?kjkjh ç'u , oa [k.M ^l * eanl?kz mYkjh ç'u gA [k.M v* dks l c l s i g y s y d j A

Note : Section 'A', containing 10 very short-answer-type questions, is compulsory. Section 'B' consists of short-answer-type questions and Section 'C' consists of long-answer-type questions. Section 'A' has to be solved first.

Section - 'A'

fuFuFdr vfry?kjkjh ç'ula ds mYkj , d ; k nks o l D ; k s e a n A

(Answer the following very short-answer-type questions in one or two sentences.) (1x10=10)

ç'u 1- ml funak ra= dk uke fyf[k,] tksU; Wu ds fu; e dk ikyu d j r s g A Write the name of reference frame that follows the Newton's law.

ç'u 2- dtyj ds xgh; xfr ds rrrh; fu; e dk xf.krh; : i fyf[k, A Write the mathematical form of Kepler's third law of planetary motion.

ç'u 3- e[; tMRo vk?kwkz rFkk e[; v{kka ea l eak fyf[k, A Write the relation between principal moment of Inertia and principal axes.

ç'u 4- folko dh ds fuEure fcnqij iD.krk dk eku fdruk gkrk gS What will be value of gradient at the lowest point of the potential well ?

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ç'u 5- voefnr nkfy = dh vuqknh vkofYk (fr) ds fy, 0; at d fyf[k, A

Write the expression for the resonant frequency (fr) of the damped harmonic oscillator.

ç'u 6- , d vkof'kr d.k dks , d l eku pcdh; {ks= ds l ekarj fn'kk ea Nk&Nk x; k gS bl ds ekxZ dk vkdkj D; k gksk\

A charged particle is released in a uniform magnetic field in its parallel direction. What will be the shape of its path?

ç'u 7- nks 0; frdkjh rjxka ds vk; ke 1/2 vuqkr ea gA U; ure rFkk vf/kdre rhor'kva dk vuqkr D; k gksk\

The amplitudes of the two interfering waves are in 1:2 ratio. What will be the ratio of minimum and maximum intensities?

ç'u 8- Økfl r \vec{E} rFkk \vec{B} {ks=ka ea vfo{kfi r fudyus okys vk; ula dk ox fdruk gkrk gS

What is the velocity of undeflected ions emerging out of crossed \vec{E} and \vec{B} fields?

ç'u 9- iKW tu vuqkr dk l d) kird eku D; k gkrk gS

What is the theoretical value of Poisson's Ratio?

ç'u 10- lok'k tyh dk l # fyf[k, A

Write Poiseuille's formula.

Section - 'B'

fuEufedr y?k mYkj; ç'ula ds mYkj 150&200 'kñ l hek ea nA

(Answer the following short-answer-type questions with word limit 150-200) (3x5=15)

ç'u 1- fl) djksfd cy vk?kwZ $\vec{\tau} = dL/dt$; l ox ifjorU dh nj $\frac{dL}{dt}$

Prove that the torque $\vec{\tau} =$ rate of change of angular momentum $\frac{dL}{dt}$

OR

Åtk l j{k.k dk fu; e fyf[k, A

Write the law of conservation of energy.

(3)

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ç'u 2- fl) djksfd , d ; ksd ysyd dsfuyEcu fcnqrFkk nksyu fcnq ijLij ifjorU; gksr gS

Show that the point of suspension and the point of oscillation of a compound pendulum are interchangeable?

OR

gyegkVt vuqknD; k gS bl dk mi ; ks fyf[k, A

What is Helmholtz Resonator? Write its use.

ç'u 3- v; kji .k dk fl) kr fyf[k, A ; g fl) kr dc ykxgsk gsrFkk dc ugh

State the principle of superposition. In which condition this principle is applicable and when is it invalid?

OR

fyLI ktw vkNfr; k D; k gkrh gS buds mi ; ks fyf[k, A

What are Lissajous Figures? Write their uses.

ç'u 4- byDVkU xu D; k gS bl dh dk; fof/k dks l e>kb; A

What is an electron gun? Explain its working?

OR

l kbDyKs/WU dk dk; Zkjh fl) kr l e>kb; A

Write the working principle of Cyclotron.

ç'u 5- dsVh yhoj D; k gS bl dk vf/kdre voueu dgk; gkrk gS

What is Cantilever? Where is the maximum depression in it?

OR

/kkjkj[kh; iDkg rFkk fo{k/k iDkg ea varj crkb; A

Distinguish between the streamline flow and turbulent flow.

Section - 'C'

fuEufedr nFkZ mYkj; ç'ula ds mYkj 300&350 'kñ l hek ea nA

(Answer the following long-answer-type questions with word limit 300-350) (5x5=25)

ç'u 1- xlyh; funZkkad i) fr eafdl h xfreku d.k ds ox rFkk Roj .k ds fy, , d 0; at d fuxter dhft, A

Derive an expression for the velocity and acceleration of a moving particle in spherical co-ordinate system.

P.T.O.