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TH241130MINB

Reg. No.....

Name.....

FYUG PROGRAMME EXAMINATION, NOVEMBER 2024

(2024 Admission Regular)

SEMESTER I – MINOR B COURSE (PHYSICS)

PH1DSCB101B24 - FOUNDATIONS OF PHYSICS

Time: 1.5 Hours **Maximum Marks: 50**

PART A

I. Answer all questions (MCQ). Each question carries 1 mark

Q.No:	QUESTIONS	CO	LEVEL
1.	The length of a wire is reported as 2.4378 ± (21). This notation implies: (a) 2.4378 ± (0.021) (b) 2. 437821 (c) 2.4378 ± (0.0021) (d) 23. 4378	1	U
2.	If ΔU is the change in potential energy, the work W done by a conservative force equals: (a) $-\nabla U$ (b) $+\nabla U$ (c) $-\nabla U^2$ (d) $\frac{\nabla U}{U}$	4	U
3.	Kinetic energy of a particle can be (a) Positive, negative or zero (b) Positive or zero (c) Negative or zero (d) Positive and negative, but not zero	4	U
4.	Work – energy theorem can be used in (a) In both inertial and non inertial reference frames (b) Only in inertial reference frames (c) Only in non inertial reference frames (d) In accelerated reference frames	4	U
5.	For mathematical operators, Python program has highest preference for (a) Multiplication (b) Exponentiation (c) Parenthesis (d) Addition	5	U

(5x1=5)

II. Answer all questions in one word. Each question carries 1 mark

Q.No:	QUESTIONS	CO	LEVEL
6.	Give any one example for circular motion.	2	U
7.	If the displacement of the particle is zero then what will be its average velocity?	1	Ap

8.	If a 1 kg object falls with an acceleration of 9.8 m/s^2, the required force has magnitude of ____ .	3	Ap
9.	Write an application of Newton's first law.	3	Ap
10.	Write the syntax in Python program to print the remainder of two numbers 40 and 6.	5	An

(5x1=5)

PART B

III. Answer any six questions in one paragraph. Each question carries 5 marks.

Q.No:	QUESTIONS	CO	LEVEL
11.	Find the angle between the vectors $\vec{A} = 2.00\,\hat{\imath} + 3.00\hat{\jmath} + 1.00\hat{k}$ and $\vec{B} = -4.00\hat{\imath} + 2.00\hat{\jmath} - 1.00\hat{k}$	1	Ap
12.	(i) Define instantaneous velocity. (ii)A bird is flying due east. Its distance from a tall building is given by $x(t) = 32.0\,m + (11.3\,m/s)t - (0.04\,m/s^3)t^3$. Find the instantaneous velocity of the bird when t= 8.00 s.	2	Ap
13.	A worker applies a constant horizontal force with magnitude 10 N to a box with mass 20 kg resting on a level, freshly waxed floor with negligible friction. Estimate the acceleration of the box.	3	Ap
14.	A toboggan loaded with students (total weight w) slides down a snow-covered hill that slopes at a constant angle α. The toboggan is well waxed, so there is virtually no friction. Compute its acceleration.	3	Ap
15.	Derive an expression for instantaneous power.	4	An
16.	Show that 1 hp = 746 W.	4	Ap
17.	Discuss the three types of flow of control in Python programming using examples.	5	An
18.	Discuss the different types of tokens used in Python program.	5	U

(6x5=30)

PART C

IV. Answer any one question. The question carries 10 marks.

Q.No:	QUESTIONS	CO	LEVEL
19.	Define a projectile. With the help of equations of motion show that the shape of trajectory in projectile motion is a parabola. Obtain the relations for maximum height and maximum range of a projectile motion in terms of initial speed v_0 and an initial angle α_0.	2	Ap
20.	(a) Differentiate between static, kinetic and rolling frictional forces and deduce the coefficients of friction in each case. (b) Discuss conservative and non-conservative forces with examples.	4	An

(1x10=10)

CO : Course Outcomes

Level : R – Remember, U – Understand, Ap- Apply, An- Analyze, E- Evaluate, C- Create