**KV, Banbasa NHPC**

**Term – I Examination**

**Class XI Subject Physics SET A**

**Session 2021 – 2022**

Time: 90 Minutes

General Instructions: 1. The Question Paper contains three sections. 2. Section A has 25 questions. Attempt any 20 questions. 3. Section B has 24 questions. Attempt any 20 questions. 4. Section C has 6 questions. Attempt any 5 questions. 5. All questions carry equal marks. 6. There is no negative marking. 7. Take

Section A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | The strongest force in the nature is | | | |
|  | (i) strong nuclear | (ii) electromagnetic | (iii) gravitational | (iv) weak nuclear |
| 2 | Which is a property of nuclear forces? | | | |
|  | (i) charge dependent | (ii) distance dependent | (iii) mass dependent | (iv) none of these |
| 3 | Which of the following is interdisciplinary? | | | |
|  | (i) ray optics | (b) current and electricity | (iii) radioactivity | (iv) none of these |
| 4 | Identify the derived unit among the following. | | | |
|  | (i) Ampere | (ii) Candela | (iii) radian | (iv) Joule |
| 5 | There are ­­­­­­­­­­­­---------------------­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom | | | |
|  | (i) 9,912,770,631 | (ii) 9,192,631.770 | (iii) 9,631,770,192 | (iv) 9,770,631,192 |
| 6 | The dimension of work is | | | |
|  | (i) [M-1L-2T2] | (ii) [M1L2T2] | (iii) [M1L2T-2] | (iv) [M2L2T2] |
| 7 | A bus travelling between two cities is an example of | | | |
|  | (i) uniform motion | (ii) non-uniform motion | (iii) circular motion | (iv) motion in a straight line |
| 8 | Which of the following graphs represents motion at constant speed? | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 9 | The correct relationship between distance and displacement is | | | |
|  | (i) distance = displacement | (ii) distance ≥ displacement | (iii) distance ≤ displacement | (iv) none of these |
| 10 | Velocity can never be \_\_\_\_\_\_\_\_\_\_\_\_\_ than speed. | | | |
|  | (i) more | (ii) less | (iii) equal | (iv) none of these |
| 11 | For a uniformly accelerated object, the position time graph is a | | | |
|  | (i) horizontal line | (ii) vertical line | (iii) circle | (iv) a curve |
| 12 | Which of the following position time graph is not possible? | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 13 | Which of the following is a scalar quantity? | | | |
|  | (i) current | (ii) displacement | (iii) velocity | (iv) momentum |
| 14 | Which of the following is a vector quantity? | | | |
|  | (i) current | (ii) force | (iii) energy | (iv) work |
| 15 | The dot (scalar) product of two vectors is always a | | | |
|  | (i) scalar | (ii) vector | (iii) number | (iv) none of these |
| 16 | The cross product of two vector is always a vector that is | | | |
|  | (i) parallel to each vector | (ii) perpendicular to each vector | (iii) normal to either vector | (iv) none of these |
| 17 | Two or more vectors are called co-initial if | | | |
|  | (i) have same value | (ii) have same direction | (iii) have same units | (iv) they start at same point |
| 18 | The magnitude of a null vector is | | | |
|  | (i) zero | (ii) unit | (iii) infinite | (iv) none of these |
| 19 | When two parallel vectors are cross multiplied, the result is | | | |
|  | (i) unit vector | (ii) null vector | (iii) either (i) or (ii) | (iv) none of these |
| 20 | An object thrown at an angle with respect to the horizontal, moves over a | | | |
|  | (i) circular path | (ii) straight line path | (iii) hyperbolic path | (iv) parabolic path |
| 21 | A ball is thrown such that it attains maximum height above Earth’s surface. What is its angle of projection? | | | |
|  | (i) 300 | (ii) 450 | (iii) 900 | (iv) 600 |
| 22 | The inertia of an object depends upon its | | | |
|  | (i) speed | (ii) velocity | (iii) mass | (iv) momentum |
| 23 | Force exerted on an object can change its | | | |
|  | (i) speed | (ii) direction | (iii) shape | (iv) all of these |
| 24 | The second law of motion can be expressed mathematically as | | | |
|  | (i) | (ii) | (iii) | (iv) |

Section B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 25 | Number of significant figures in 001.122310 is | | | |
|  | (i) 6 | (ii) 7 | (iii) 8 | (iv) 9 |
| 26 | The time period of a simple pendulum depends upon its length (L) and acceleration due to gravity (g) such that | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 27 | The unit of energy in SI and CGS system is Joule and Erg, respectively. Then | | | |
|  | (i) 1 Joule = 105 erg | (ii) 1 Joule = 107 erg | (iii) 1 Joule = 109 erg | (iv) 1 Joule = 1011 erg |
| 28 | Speed of an object is given as . The object would be stationary at | | | |
|  | (i) t = 1 s | (ii) t = 2 s | (iii) t = 3 s | (iv) t = 4s |
| 29 | A bus starts at station A at 8 AM and reaches station B at 9:30 AM. It stops at station B for 30 minutes and then reaches station C at 11 AM. If total distance covered is 150 km, then average speed of the bus is | | | |
|  | (i) 40 km/h | (ii) 45 km/h | (iii) 50 km/h | (iv) 55 km/h |
| 30 | The position of an object is given as . Its velocity at time t = 2 s is | | | |
|  | (i) 2 m/s | (ii) 4 m/s | (iii) 6 n/s | (iv) 8 n/s |
| 31 | A ball is thrown vertically upwards with initial speed of 10 m/s. Find out its height after 1 s. | | | |
|  | (i) 5 cm | (ii) 5 m | (iii) 50 cm | (iv) 50 m |
| 32 | The area covered by v-t graph is a measure of | | | |
|  | (i) distance | (ii) acceleration | (iii) velocity | (iv) energy |
| 33 | A ball dropped from certain height is an example of | | | |
|  | (i) retarded motion | (ii) accelerated motion | (iii) rotational motion | (iv) none of these |
| 34 | The motion of an object is shown by following speed time graph. What is the distance covered by the object. | | | |
|  | (i) 10 m | (ii) 20 m | (iii) 30 m | (iv) 40 m |
| 35 | The unit vector for is | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 36 | A ball is thrown in such a way that its range and height are equal. Then the angle of projection is | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 37 | An object covers maximum horizontal distance when thrown at an angle of | | | |
|  | (i) 300 | (ii) 450 | (iii) 600 | (iv) 900 |
| 38 | The dot product of and is | | | |
|  | (i) -1 unit | (ii) -3 unit | (iii) 1 unit | (iv) 3 unit |
| 39 | The cross product of and is | | | |
|  | (i) 0 | (ii) *i* | (iii) *j* | (iv) *k* |
| 40 | A ball of mass 50 g is moving with speed of 10 m/s and returns with a speed of 8 m/s after striking the wall. What is the impulse imparted to the ball? | | | |
|  | (i) 0.9 kg.m/s | (ii) 1.8 kg.m/s | (iii) 0.9 g.m/s | (iv) 1.8 g.m/s |
| 41 | A force of 12 N works at an angle of 300 above horizontal direction. Its horizontal and vertical components are | | | |
|  | (i) | (ii) | (iii) | (iv) |
| 42 | The angle between vector and is | | | |
|  | (i) 00 | (ii) 900 | (iii) 1200 | (iv) 1800 |
| 43 | Identify the correct relationship | | | |
|  | (i) | (ii) | (iii) | (iv) none of these |
| 44 | If a force of 40 N acts on an object of mass 100 kg, its acceleration will be | | | |
|  | (i) 4 m/s2 | (ii) 0.4 m/s2 | (iii) 0.01 m/s2 | (iv) 40 m/s2 |
| 45 | Assertion : Newton’s second law is the real law of motion  Reason : Both first and third law can be drawn from second law of motion. | | | |
|  | (i) Both Assertion and Reason are correct and reason is correct explanation of assertion. | (ii) Both Assertion and Reason are correct but reason is not correct explanation of assertion. | (iii) assertion is correct but reason Is not | (iv) reason is correct but assertion is not |
| 46 | Assertion : A person weighs much less on the Moon than on the Earth.  Reason : Newton’s third law does not hold good on the Moon. | | | |
|  | i) Both Assertion and Reason are correct and reason is correct explanation of assertion. | (ii) Both Assertion and Reason are correct but reason is not correct explanation of assertion. | (iii) assertion is correct but reason Is not | (iv) reason is correct but assertion is not |
| 47 | Assertion : Momentum of an object remains constant under application of net external force.  Reason : Internal forces can do no work due to Newton’s third law of motion. | | | |
|  | i) Both Assertion and Reason are correct and reason is correct explanation of assertion. | (ii) Both Assertion and Reason are correct but reason is not correct explanation of assertion. | (iii) assertion is correct but reason Is not | (iv) reason is correct but assertion is not |
| 48 | Assertion : If a person jumps from boat to river shore, the boat moves away from the shore.  Reason : This is due to conservation of mass. | | | |
|  | i) Both Assertion and Reason are correct and reason is correct explanation of assertion. | (ii) Both Assertion and Reason are correct but reason is not correct explanation of assertion. | (iii) assertion is correct but reason Is not | (iv) reason is correct but assertion is not |
| 49 | Assertion : Lubricants are used to increase friction.  Reason: Friction is necessary in certain cases. | | | |
|  | i) Both Assertion and Reason are correct and reason is correct explanation of assertion. | (ii) Both Assertion and Reason are correct but reason is not correct explanation of assertion. | (iii) assertion is correct but reason Is not | (iv) reason is correct but assertion is not |

Section C

Case Study

Friction is a dissipative force which opposes relative motion between two surfaces. Dissipative means a force where energy is converted in such a form that it cannot be recovered. It is sometime misunderstood as violation of law of conservation of energy. However, this law is not broken, neither does the law of conservation of momentum. The force of friction depends upon many factors like type of surfaces under relative motion, normal forces etc. It can be reduced by application of lubricants and increased by using cohesive materials.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 50 | The force of friction | | | |
|  | (i) opposes relative motion | (ii) supports relative motion | (iii) does not affect motion | (iv) none of these |
| 51 | The force of friction can be reduced by using | | | |
|  | (i) cohesive material | (ii) lubricants | (iii) it cannot be reduced | (iv) none of these |
| 52 | Friction is an example of | | | |
|  | (i) conservative force | (ii) non-conservative force | (iii) gravitational force | (iv) repulsive force |
| 53 | Many simple approaches, like use of tyres, is used to \_\_\_\_\_\_\_\_\_\_\_ frictional force. | | | |
|  | (i) decrease | (ii) keep same | (iii) increase | (iv) none of these |
| 54 | It is difficult to drive vehicles in desert due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction between loose sand particles. | | | |
|  | (i) infinite | (ii) high | (iii) low | (iv) zero |
| 55 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction is the highest value of friction. | | | |
|  | (i) kinetic | (ii) static | (iii) rolling | (iv) none of these |

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**Term – I Examination**

**Class XI Subject Physics SET A Answer Key**

**Session 2021 – 2022**

Section A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | (i) strong nuclear | | | |
|  |  |  |  |  |
| 2 | (ii) distance dependent | | | |
|  |  |  |  |  |
| 3 | (iii) radioactivity | | | |
|  |  |  |  |  |
| 4 | (iv) Joule | | | |
|  |  |  |  |  |
| 5 | (ii) 9,192,631.770 | | | |
|  |  |  |  |  |
| 6 | (iii) [M1L2T-2] | | | |
|  |  |  |  | (iv) [M2L2T2] |
| 7 | (ii) non-uniform motion | | | |
|  |  |  |  |  |
| 8 | (i) | | | |
|  |  |  |  |  |
| 9 | (ii) distance ≥ displacement | | | |
|  |  |  |  |  |
| 10 | (i) more | | | |
|  |  |  |  |  |
| 11 | (iv) a curve | | | |
|  |  |  |  |  |
| 12 | (i) | | | |
|  |  |  |  |  |
| 13 | (i) current | | | |
|  |  |  |  |  |
| 14 | (ii) force | | | |
|  |  |  |  |  |
| 15 | (i) scalar | | | |
|  |  |  |  |  |
| 16 | (ii) perpendicular to each vector | | | |
|  |  |  |  |  |
| 17 | (iv) they start at same point | | | |
|  |  |  |  |  |
| 18 | (i) zero | | | |
|  |  |  |  |  |
| 19 | (ii) null vector | | | |
|  |  |  |  |  |
| 20 | (iv) parabolic path | | | |
|  |  |  |  |  |
| 21 | (iii) 900 | | | |
|  |  |  |  |  |
| 22 | (iii) mass | | | |
|  |  |  |  |  |
| 23 | (iv) all of these | | | |
|  |  |  |  |  |
| 24 | (ii) | | | |
|  |  |  |  |  |

Section B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 25 | (ii) 7 | | | |
|  |  |  |  |  |
| 26 | (ii) | | | |
|  |  |  |  |  |
| 27 | (ii) 1 Joule = 107 erg | | | |
|  |  |  |  |  |
| 28 | (ii) t = 2 s | | | |
|  |  |  |  |  |
| 29 | (iii) 50 km/h | | | |
|  |  |  |  |  |
| 30 | (ii) 4 m/s | | | |
|  |  |  |  |  |
| 31 | (ii) 5 m | | | |
|  |  |  |  |  |
| 32 | (i) distance | | | |
|  |  |  |  |  |
| 33 | (ii) accelerated motion | | | |
|  |  |  |  |  |
| 34 | (iii) 30 m | | | |
|  |  |  |  |  |
| 35 | (i) | | | |
|  |  |  |  |  |
| 36 | (iv) | | | |
|  |  |  |  |  |
| 37 | (ii) 450 | | | |
|  |  |  |  |  |
| 38 | (ii) -3 unit | | | |
|  |  |  |  |  |
| 39 | (i) 0 | | | |
|  |  |  |  |  |
| 40 | (i) 0.9 kg.m/s | | | |
|  |  |  |  |  |
| 41 | (iii) , | | | |
|  |  |  |  |  |
| 42 | (ii) 900 | | | |
|  |  |  |  |  |
| 43 | (i) | | | |
|  |  |  |  |  |
| 44 | (ii) 0.4 m/s2 | | | |
|  |  |  |  |  |
| 45 | (i) Both Assertion and Reason are correct and reason is correct explanation of assertion | | | |
|  |  |  |  |  |
| 46 | (iii) assertion is correct but reason Is not | | | |
|  |  |  |  |  |
| 47 | (iv) reason is correct but assertion is not | | | |
|  |  |  |  |  |
| 48 | (iii) assertion is correct but reason Is not | | | |
|  |  |  |  |  |
| 49 | (iv) reason is correct but assertion is not | | | |
|  |  |  |  |  |

Section C

Case Study

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 50 | (i) opposes relative motion | | | |
|  |  |  |  |  |
| 51 | (ii) lubricants | | | |
|  |  |  |  |  |
| 52 | (ii) non-conservative force | | | |
|  |  |  |  |  |
| 53 | (iii) increase | | | |
|  |  |  |  |  |
| 54 | (iii) low | | | |
|  |  |  |  |  |
| 55 | (ii) static | | | |
|  |  |  |  |  |