ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

RESOURCES FOR

"HSC-I PHYSICS"

ZUEB EXAMINATIONS 2021

PREFACE:

The ZUEB examination board acknowledges the serious problems encountered by the schools and colleges in smooth execution of the teaching and learning processes due to sudden and prolonged school closures during the covid-19 spread. The board also recognizes the health, psychological and financial issues encountered by students due to the spread of covid-19.

Considering all these problems and issues the ZUEB Board has developed these resources based on the condensed syllabus 2021 to facilitate students in learning the content through quality resource materials.

The schools and students could download these materials from www.zueb.pk to prepare their students for the high quality and standardized ZUEB examinations 2021.

The materials consist of examination syllabus with specific students learning outcomes per topic, Multiple Choice Questions (MCQs) to assess different thinking levels, Constructed Response Questions (CRQs) with possible answers, Extended Response Questions (ERQs) with possible answers and learning materials.

ACADEMIC UNIT ZUEB:

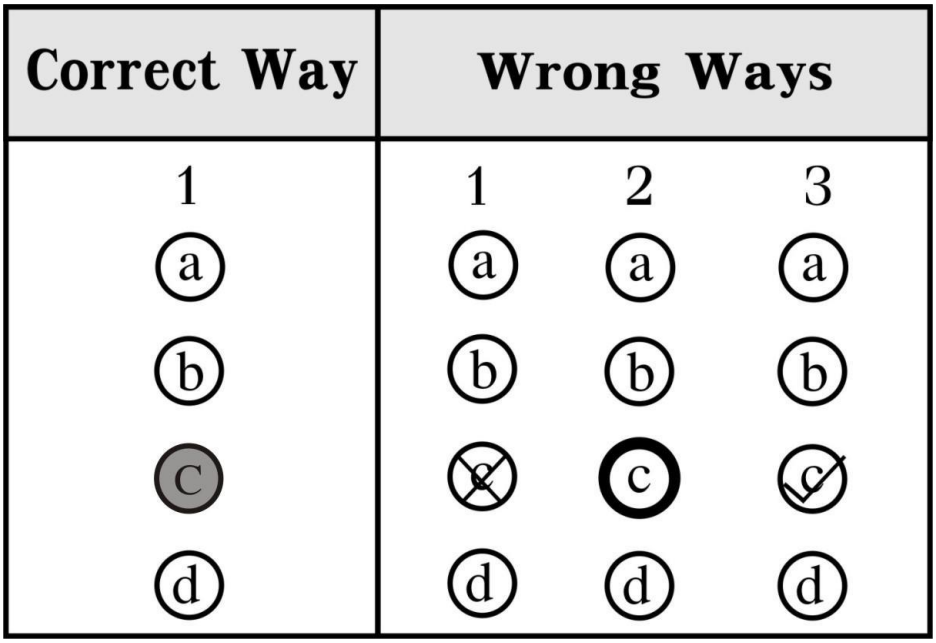
1: Multiple Choice Questions:

The Multiple-Choice Questions with a stem, correct answer and 3 distractors or plausible wrong answers format is designed to assess the content and thinking of students from; R (Remembering); U(Understanding) and A (Applying, Analyzing, Evaluating, Creating). The questions are also classified into three difficulty levels accordingly; D (DIFFICULT), M (MODERATE), E (EASY)

HOW TO ATTEMPT AN MCQ:

MCQ:

- **EACH MCQ HAS FOUR OPTIONS, A, B, C AND D. SELECT ONE OPTION AS THE BEST ANSWER AND FILL IN THE CIRCLE OF THAT OPTION, FOLLOWING THE INSTRUCTIONS GIVEN BY THE INVIGILATOR.**
- **USE BLACK PEN/PENCIL TO FILL IN THE CIRCLE.**



S#	MCQ'S MATERIAL (CHAPTER -01)	KEY	CL	DL
1.	What are the dimensions of velocity? a) LT^{-2} b) $L^{-2}T$ c) $L^{-1}T^{-1}$ d) **$\underline{L\,T^{-1}}$**	**$\underline{L\,T^{-1}}$**	**K/R**	**E**
2.	What are the dimensions of acceleration? a) LT^{2} b) LT^{3} c) **$\underline{LT^{-2}}$** d) LT^{1}	**$\underline{LT^{-2}}$**	**K/R**	**D**
3.	What are the dimensions of momentum? a) $ML^{-1}T$ b) $ML^{-2}T$ c) MLT^{-2} d) **$\underline{M\,L\,T^{-1}}$**	**$\underline{M\,L\,T^{-1}}$**	**K/R**	**M**
4.	What are the dimensions of force? a) **$\underline{M\,L\,T^{-2}}$**	**$\underline{M\,L\,T^{-2}}$**	**K/R**	**D**

	b) $M L^{-1} T^{-2}$ c) $M L T^{2}$ d) $M L T^{-1}$			
5.5	The dimensions of torque are: a) $M L^{2} T$ b) $M L^{2} T^{2}$ c) **$\underline{M L^{2} T^{-2}}$** d) $M L T^{2}$	**$\underline{M L^{2} T^{-2}}$**	**K/R**	**M**
6.	What are the dimensions of angular velocity? a) **$\underline{T^{-1}}$** b) T^{-2} c) T^{2} d) T	**$\underline{T^{-1}}$**	**K/R**	**E**
7.	What are dimensions of angular acceleration? a) T^{-1} b) **$\underline{T^{-2}}$** c) T^{2} d) T	**$\underline{T^{-2}}$**	**K/R**	**E**
8.	What are the dimensions of work? a) $M^{3} L T^{2}$ b) $M L^{-1} T$ c) **$\underline{M L^{2} T^{-2}}$** d) $M L T^{-1}$	**$\underline{M L^{2} T^{-2}}$**	**K/R**	**D**
9.	What are the dimensions of energy (kinetic energy)? a) $M L^{2} T^{3}$ b) $M L^{-1} T$ c) **$\underline{M L^{2} T^{-2}}$** d) $M L T^{-1}$	**$\underline{M L^{2} T^{-2}}$**	**K/R**	**M**
10.	What are the dimensions of Power? a) $M L^{2} T^{3}$ b) $M L^{-1} T$ c) **$\underline{M L^{2} T^{-3}}$** d) $M L T^{-1}$	**$\underline{M L^{2} T^{-3}}$**	**K/R**	**D**
11.	The dimension of density is: a) $L T^{-2}$ b) $M L^{3}$ c) $M L^{-1} T^{-2}$ d) **$\underline{M L^{-3}}$**	**$\underline{M L^{-3}}$**	**K/R**	**M**
12.	What are dimensions of frequency? a) T^{2} b) T^{-3} c) **$\underline{T^{-1}}$** d) T	**$\underline{T^{-1}}$**	**K/R**	**E**
13.	The dimension of "G" are: a) $M^{-1} L^{-2} T^{3}$ b) **$\underline{M^{-1} L^{3} T^{-2}}$** c) $M L^{-2} T^{3}$ d) none of these	**$\underline{M^{-1} L^{3} T^{-2}}$**	**K/R**	**E**
14.	The dimension of angular momentum: a) **$\underline{M L^{2} T^{-1}}$**	**$\underline{M L^{2} T^{-1}}$**	**K/R**	**D**

	b) M L ^{2} T c) M L T $^{-1}$ d) M L T $^{-2}$			
15.	The dimension of angular viscosity are: a) ML^0T^{-1} b) ML^0T^{-2} c) $\boldsymbol{M^0L^0T^{-1}}$ d) $M^0L^0T^{-2}$	$\boldsymbol{M^0L^0T^{-1}}$	**K/R**	**M**
16.	The ratio of the dimensions of area to those of volume is a) $\boldsymbol{L^{-1}}$ b) L^{-2} c) L^2 d) L	$\boldsymbol{L^{-1}}$	**K/R**	**D**
17.	The dimension of coefficient of friction is: a) MLT b) ML^2T^1 c) $\boldsymbol{M^0L^0T^0}$ **d)** ML^0T^{-1}	$\boldsymbol{M^0L^0T^0}$	**K/R**	**M**
18.	The dimensions of G/g are: a)$M^0L^1T^{-2}$ b) $M^1L^2T^{-2}$ c) $M^{-1}L^2T^2$ d) $\boldsymbol{M^{-1}L^2T^0}$	$\boldsymbol{M^{-1}L^2T^0}$	**K/R**	**E**
19.	A vector is a physical quantity which has: a) Magnitude **b) Both magnitude and direction** c) Direction d) Either magnitude or direction	**Both magnitude and direction**	**K/R**	**E**
20.	Scalar is a physical quantity: a) Number only **b) Number with proper units,** c) Direction only d) Number with direction	**Number with proper units,**	**K/R**	**D**
21.	A vector which can represent the position of a point with respect to some fixed point in a coordinate system is called. a) Null vector b) free vector **c) position vector** **[2007]**	**position vector**	**K/R**	**M**
22.	A vector which can be displaced parallel to itself and is applied at any point is known as _____ vector. a) Null b) Unit c) Position **d) Free** **[2009, 03 (P.M) , 92]**	**Free**	**K/R**	**D**

23.	If a vector quantity is divided by its magnitude, the vector obtained is called: **a) Unit vector** b) position vector c) null vector d) free vector **[1997 . 96, 1992]**	**Unit vector**	**K/R**	**M**
24.	If a Null or Zero vector is multiplied by an finite number, it gives a _____. a) Unit vector **b) Zero vector**	**Zero vector**	**K/R**	**E**
25.	The magnitude of unit vector will always be: **a) 1** b) 0 (zero) c) none of these	**1**	**K/R**	**E**
26.	The magnitude of a vector is always treated as: a) negative **b) non-negative** c) negative and positive both	**non-negative**	**K/R**	**D**
27.	Two or more vectors are added by: **a) head and tail rule** b) simple addition c) none of these	**head and tail rule**	**K/R**	**M**
28.	The angle between the horizontal and vertical component of vector is: a) 0° b) 45° **c) 90°**	**90°**	**K/R**	**D**
29.	The vector in space has: a) One component **b) Three components** c) Two components d) None of these	**Three components**	**K/R**	**M**
30.	The vector in a plane has: a) One component **b) Two components** c) Three components d) None of these	**Two components**	**K/R**	**E**

31.	When a vector is multiplied by a negative number its direction: a) Remains same **b) changes by 180** c) Not change d) Changes by 210 **[2009]**	**changes by 180**	**K/R**	**E**
32.	The dot product of two vectors is zero when they are a) In the same direction **b) perpendicular to each other** c) in the opposite direction	**perpendicular to each other**	**K/R**	**D**
33.	The cross product of two vectors is zero when they are a) Parallel to each other b) perpendicular to each other c) Opposite in direction **d) both a) and c)**	**both a) and c)**	**K/R**	**M**
34.	The cross product of two vectors is a: a) scalar **b) vector** c) none of these	**vector**	**K/R**	**D**
35.	The dot product of two vectors is a: **a) scalar** b) vector c) none of these	**scalar**	**K/R**	**M**
36.	The unit vectors $\hat{i}, \hat{j}$ *and* $\hat{k}$ are: a) Parallel to each other **b) perpendicular to each other** c) none of the above **[2015, 2006 , 2002 (P.E)]**	**perpendicular to each other**	**K/R**	**E**
37.	$\hat{k} . (\hat{i} \times \hat{j})$ is equal to: a) Zero **b) one** c) j d) – k	**one**	**K/R**	**E**
38.	The dot product of a unit vector *i & k* is: **a) Zero** b) 1 c) -1 d) j [2019]	**Zero**	**K/R**	**D**

39.	$(\hat{i} \times \hat{j}).(\hat{j} \times \hat{i})$ is: a) Zero b) 1 **c) -1** d) j	**-1**	**K/R**	**M**
40.	$\hat{k} . (\hat{i} . \hat{j})$ has value: **a) Zero** b) One c) j d) k **[2002 (P.M)]**	**Zero**	**K/R**	**D**
41.	$j \times j$ is equal to: a) j^2 b) j c) one **d) zero**	**zero**	**K/R**	**M**
42.	If i , j and k are the unit vectors along x, y and z axes respectively, then k x j = a) $\hat{i}$ b) $-\hat{i}$ c) 1 d) -1	$-\hat{i}$	**K/R**	**E**
43.	If $\vec{A} = a\hat{i}$ and $\vec{B} = b\hat{j}$, then $\vec{A} \times \vec{B}$ is equal to: a) $\vec{0}$ b) $ab\hat{k}$ c) $-ab\hat{k}$ d) none of these [2017supply]	$ab\hat{k}$	**K/R**	**E**
44.	If $\vec{A} = a\hat{i}$ and $\vec{B} = b\hat{j}$, then $\vec{B} \times \vec{A}$ is equal to: a) $\vec{0}$ b) $ab\hat{k}$ c) $-ab\hat{k}$ d) none of these **[2014 ,05]**		**K/R**	**D**

45.	If $\vec{A}$. $\vec{B}$ = 0 and $\vec{A} x \vec{B}$ = 0 and $\vec{A} \neq$ O, the vector $\vec{B}$ is: a) Equal to A **b) Zero** c) Perpendicular to A d) Parallel to A **[2004]**	**Zero**	**K/R**	**M**
46.	If the velocity time graph of a body is a straight line, parallel to time- axis, its acceleration will be: **a) Zero** **b)** Maximum **c)** Minimum **d)** Uniform	**Zero**	**K/R**	**D**
47.	If the velocity time graph of a moving body is a curve, the body moves with: a) Constant speed **b)** Constant velocity b) Constant acceleration **d) Changing acceleration**.	**Changing acceleration**.	**K/R**	**M**
48.	When a constant force is applied on a body, it move with: **a)** Constant speed **b)** Constant velocity **c) Constant acceleration** **d)** None	**Constant acceleration**	**K/R**	**E**
49.	Swimming is possible because of which law of motion **a)** First **b)** Second **c) Third** **d)** None of these	**Third**	**K/R**	**E**
50.	A boy pushes first a large and then a small car. He moves the small faster. This is an example of: **a)** Newton's first law of motion **b) Newton's second law of motion** **c)** Newton's third law of motion **d)** None of these	**Newton's second law of motion**	**K/R**	**D**
51.	Newton's first law of motion is also called **a)** Law of torque **b)** Law of force **c) Law of inertia**. **d)** None of these	**Law of inertia**	**K/R**	**M**
52.	Inertia of a body is measured in term of: a) **Its mass** b) Its weight c) Its velocity d) Its reaction	**Its mass**	**K/R**	**D**

53.	The second law of motion shows the relation between **a)** Mass and weight **b)** Mass and velocity **c)** **Mass and acceleration** **d)** Force and Velocity	**Mass and acceleration**	**K/R**	**M**
54.	Newton's second law of motion is also called: **a)** Law of gravitation **b)** Law of inertia **c)** Law of inertial frame **d)** **Law of acceleration**	**Law of acceleration**	**K/R**	**E**
55.	In C.G.S system the unit of force is: a) Joule b) Newton c) **Dyne** d) Slug Foot / s^2	**Dyne**	**K/R**	**E**
56.	One dyne is equal to: **a)** **10^{-5} N** **b)** 10^{5} N **c)** 10^{-3} N **d)** 10^{3} N	**10^{-5} N**	**K/R**	**D**
57.	The rate of change of linear momentum is equal to: **a)** Acceleration **b)** Torque **c)** Angular velocity **d)** **Force**	**Force**	**U**	**M**
58.	The unit of linear impulse is the same as that of: **a)** Force **b)** **Momentum** **c)** Energy **d)** None of these	**Momentum**	**K/R**	**D**
59.	Impulse or Impulse of force can be expressed as: **a)** $F \Delta t$ **b)** $m V_f - m V_i$ **c)** Change of momentum **d)** **All of these**	**All of these**	**U**	**M**
60.	A stone has mass 100 gm. Its weight will be: a) 9800 N b) **0.98 N** c) 0.0980 N d) 98000 N	**0.98 N**	**K/R**	**E**
61.	Inertia of a body is measured in terms of: a) **Its mass** b) Its weight c) Its velocity d) Its reaction	**Its mass**	**U**	**E**
62.	A body is thrown vertically upward with initial velocity 9.8 m/s. It will attain a height: a) 9.8 m b) 19.8 m c) **4.9 m** d) 29.4 m	**4.9 m**	**K/R**	**D**

63.	A mass of 5 kg moves with an acceleration of 10 m/s^2 force on it is: a) 10 N b) **50 N** c) 2 N d) 15 N	**50 N**	**U**	**M**
64.	Pull of earth on a mass of 20 kg on the surface of earth is: a) 20 N b) 19.6 N c) **196 N** d) 1960 N	**196 N**	**K/R**	**D**
65.	If F is kept constant and m is doubled, then acceleration is a) One-four b) **One-half** c) One-third d) One-ninth	**One-half**	**U**	**M**
66.	The force which attracts a body towards the center of earth is called: a) Mass b) **Weight** c) Density d) Acceleration	**Weight**	**K/R**	**E**
67.	Newton is the force which produces an acceleration of 1 m / Sec^2 in a body of mass: a) 0.5 Kg b) **1 Kg** c) 2 Kg d) 2 gm	**1 Kg**	**U**	**E**
68.	A force of 50 N acts on a body for 10 second what will be the change in momentum: a) 200 N.S b) 800 N.S c) 5 N.S d) **500 N.S** **[2012]**	**500 N.S**	**K/R**	**D**
69.	A helicopter weighing 3920 N if is moving up with the constant spe 4m/s. the force on helicopter is a) 4720N b) **3920N** c) 3924N d) 3916N **[2002 P.E]**	**3920N**	**U**	**M**
70.	A helicopter of mass 3 x 1 0 ^{3} kg rises vertically with a constant speed of 25 m/sec. what resultant force acts on the helicopter? a) Zero b) 3 x 10 ^{4} N downward c) **3 x 10 ^{4} N upward** d) 7.5 x 10 ^{4} N upward.	**3 x 10 ^{4} N upward**	**K/R**	**D**
71.	A body has an initial velocity of 8 m/s. after moving 4m its velocity is 12 m/s. what is the acceleration? a) **10 m/s^2** b) 100 m/s^2 c) 4 m/s^2 d) 40 m/s^2 **[2003 (P.M)]**	**10 m/s^2**	**U**	**M**

72.	A body goes from 2 meter to 8-meter mark and back to 2-meter mark in 3 sec. its average speed is: a) 2 m sec^{-1} b) 6 m sec^{-1} c) **4 m sec^{-1}** d) Zero **[2013, 03 (P.M)]**	**4 m sec^{-1}**	**K/R**	**E**
73.	How much height does a freely falling body of mass 10 kg lose in 2 sec? a) 9.8 m b) **19.6 m** c) 49 m d) 4. 9 m **[2002 P.M , 2011]**	**19.6 m**	**U**	**E**
74.	A 1kg stone when falling from a height of 10 m, strikes the ground with the velocity of a) 10 m/s b) **14 m/s** c) 98 m/s d) 19.6 m/s	**14 m/s**	**K/R**	**D**
75.	If a light object collides elastically with a massive body which is at rest, light object will: a) **Rebound with the same velocity** b) be stopped c) Rebound with twice the velocity d)cause the massive body to move	**Rebound with the same velocity**	**U**	**M**
76.	The magnitude of static friction is: a) Always less than the kinetic friction b) Always greater than kinetic friction c) Equal to kinetic friction d) **Sometime smaller and sometime greater than the kinetic friction**	**Sometime smaller and sometime greater than the kinetic friction**	**K/R**	**D**
77.	A force which resists the motion of a body is called: a) Friction b) State friction c) Kinetic friction d) **All of these** **[2015.12]**	**All of these**	**U**	**M**
78.	The property of fluids due to which they resist their flow is called: **a)** Static friction **b)** Coefficient of friction **c) viscosity** **d)** Terminal velocity	**viscosity**	**K/R**	**E**
79.	A body falling down through a fluid experiences a frictional force which is given by: a) Law of graviton b) Smell's law c) **Stoke's law** d) None of these **[2007, 06 , 02 P.E]**	**Stoke's law**	**U**	**E**

80.	Stokes' Law for fluid friction is given as: **a)** $F = 6 \pi \eta r^2 \nu$ **b)** **$F = 6 \pi \eta r \nu$** **c)** $F = 4 \pi \eta r^2 \nu$ **d)** $F = \pi \eta r \nu$ **[2005]**	**$F = 6 \pi \eta r \nu$**	**K/R**	**D**
81.	In Stoke's Law, the viscous force is not proportional to: **a)** Co-efficient of viscosity **b)** Radius of the sphere **c)** Terminal velocity **d)** **Mass of the sphere.**	**Mass of the sphere.**	**U**	**M**
82.	Stoke's Law holds goods for the: **a)** Bodies of all shapes **b)** **Motion through viscous medium** **c)** Motion through non-viscous medium **d)** Motion through a vacuun **[1996]**	**Motion through viscous medium**	**K/R**	**D**
83.	A rain drop continues to fall with a uniform velocity when: **a)** Its weight is balanced by air friction **b)** **Its weight is balanced by air friction and up thrust** **c)** Its weight is balanced by up thrust **d)** None of these **[2018]**	**Its weight is balanced by air friction and up thrust**	**U**	**M**
84.	An object is falling through a viscous fluid with terminal velocity. Its velocity: **a)** is decreasing **b)** Is increasing **c)** remains constant **d)** **becomes zero** **[2019]**	**becomes zero**	**K/R**	**E**
85.	If F be the limiting friction and R be the normal reaction force, then co-efficient of static friction is equal to: **a)** **F/R** **b)** FR **c)** R/F **d)** 1/FR	**F/R**	**U**	**E**
86.	The acceleration of a body moving down a smooth plane inclined at 30° will be: a) $9.8\ m/s^2$ **b)** **$4.9\ m/s^2$** c) $980\ m/s^2$ d) None of these	**$4.9\ m/s^2$**	**K/R**	**D**
87.	A body is moving up a frictionless inclined plane surface at an angle of 45°. Its acceleration is given by: a) $6.93\ m/s^2$ **b)** **$-6.93\ m/s^2$** c) $3.46\ m/s^2$ d) $-3.46\ m/s^2$	**$-6.93\ m/s^2$**	**U**	**M**

88.	In projectile motion the object is purely under the influence of: a) Centripetal force b**) Force of gravity** c) Restoring force d) None of these **[2004]**	**Force of gravity**	**K/R**	**D**
89.	When motion on a curved path, when one component of velocity is constant and the other is variable is called: a) Circular motion b) **Projectile motion** c) Vibratory motion **[2003 (P.E)]**	**Projectile motion**	**U**	**M**
90.	In projectile motion a body moves with: a) Constant vertical component of velocity b) **Constant horizontal component of velocity** c) Both changing horizontal and vertical components of velocity. d) Horizontal component changing but vertical component of velocity constant.	**Constant horizontal component of velocity**	**K/R**	**E**
91.	At maximum height, the vertical component of the velocity of projectile is: a) Minimum b) **Zero** c) Maximum d) 9.8 m/s	**Zero**	**U**	**E**
92.	In projectile the acceleration along vertical direction will: a) Decrease b) Increase c) **Remain the same** d) None of these	**Remain the same**	**K/R**	**D**
93.	A bomb is dropped from an airplane. Its acceleration is: a) Continuously increasing b) Continuously decreasing c) **Constant** d)None of these	**Constant**	**U**	**M**
94.	The path of the projectile is: a**) Parabolic** b) Hyperbolic c) Elliptical d) Straight **[2003 (P.M)]**	**Parabolic**	**K/R**	**D**
95.	A projectile is fired with the initial velocity of 90 m/s to hit a ground level target. Its maximum horizontal range will be: A. a) 9.2m b) **826.5m** c) 413m d) 81 m	**826.5m**	**U**	**M**
96.	If the angle of elevation of the projectile is 90^o then its horizontal range will be: a) Minimum b) **Zero** c) Maximum d) 9.8 m/s	**Zero**	**K/R**	**E**

97.	For the maximum range of the projectile the angle of elevation must be: a) 0^o b) **45º** c) 90^o d) 30^o	**45º**	**U**	**E**
98.	If a projectile has some horizontal range at an angel of elevation of 15^o then its range will be the same when the angle of elevation is equal to; a) 30^o b) 45^o c) **75º** d) 90^o **[2009, 2002 (P.M)]**	**75º**	**K/R**	**D**
99.	If a projectile is thrown at an angle of 35°, it hits a certain target. It will have the same range if it is thrown at an angle of: a) 45° b) **55°** c) 10° d) 70° **[2008]**	**55°**	**U**	**M**
100.	Two projectiles A and B are thrown up with the same speed at an angle of 60° and 30° respectively with the horizontal, then a) The range of "A" will be greater b) The range of "B" will be greater c) **The range of A and B will be the same** d) The range is independent of the angles **[2002 (P.M)]**	**The range of A and B will be the same**	**K/R**	**D**
101.	If a projectile is launched at 45° with velocity 100 m/s, it hits the target it will be have double the range if its velocity is: a) **141.4m/s** b) 200m/s c) 173.2 m/s d) 400 m/s	**141.4m/s**	**U**	**M**
102.	The horizontal range of the projectile is directly proportional to the: a) Initial velocity b) **Square of the initial velocity** c) Square root of the initial velocity d) None of these	**Square of the initial velocity**	**K/R**	**E**
103.	The horizontal range of the projectile is directly proportion to the a) Sine of the angle of elevation b) **Sine of twice of the angle of elevation** c) Square of sine of the angle of elevation **[2010]**	**Sine of twice of the angle of elevation**	**U**	**E**
104.	The horizontal range of a projectile depends upon: a) The angle of projection b) The velocity of the projectile c) 'g' at the place **d) All of them**	**All of them**	**K/R**	**D**
105.	Maximum height of a projectile depends on: a) Angle b) Velocity c) **Both angle and velocity**	**Both angle and velocity**	**U**	**M**

106.	In projectile motion the small angle of elevation produces: a**) <u>Flat trajectory</u>** b) High trajectory c) Straight d) Circular trajectory	**<u>Flat trajectory</u>**	**K/R**	**D**
107.	In projectile motion the large angle of elevation produces: a) Flat trajectory b) Low trajectory c) **<u>High trajectory</u>**	**<u>High trajectory</u>**	**U**	**M**
108.	For the projectiles with low trajectory, their time of flight will be: a) **<u>Short</u>** b) Long c) Zero d) None of these **[2003 (P.M)]**	**<u>Short</u>**	**K/R**	**E**
109.	Due to presence of air resistance the total time of flight of a projectile. a) Remains the same b) **<u>Decreases</u>** c) Becomes zero d) Increases [2018]	**<u>Decreases</u>**	**U**	**E**
110.	A bullet is fired horizontally with 20 m/s in the absence of air friction, horizontal velocity component after 2s will be: a) 40 m/s b) **<u>20 m/s</u>** c) 10 m/s d) 5 m/s [2019]	**<u>20 m/s</u>**	**K/R**	**D**
111.	An angle subtended at its center by an arc whose length is equal to its radius is: a) 37.3° b) 47.3° c) **<u>57.3°</u>** d) 67.3° **[2019,2006 , 01**	**<u>57.3°</u>**	**U**	**M**
112.	One radian is equal to: a) 0.017° b) **<u>57.3°</u>** c) 35.7° d) 0.117° **[2002 (P.E) , 2008]**	**<u>57.3°</u>**	**K/R**	**D**
113.	A body moving along a circular path with an increasing speed possesses. a) Tangential acceleration only b) Centripetal acceleration only. c) **<u>Both tangential and centripetal acceleration</u>** d) No acceleration **[2007]**	**<u>Both tangential and centripetal acceleration</u>**	**U**	**M**
114.	Centripetal force is also called: a) **<u>Centre- seeking force</u>** b) Centripetal force c) Tangential force d) None of these **[2005]**	**<u>Centre-seeking force</u>**	**K/R**	**E**

115.	When a body moves with a constant speed in a circle: a) **Its velocity is changing** b) Its acceleration is zero c) Its acceleration is increasing d) Its velocity is uniform **[2005 , 01]**	**Its velocity is changing**	**U**	**E**
116.	The angle between centripetal acceleration and tangential acceleration is: a) 0° b**) 90°** c) 180° d) 45° **[2002 (P.E)]**	**90°**	**K/R**	**D**
117.	The centripetal acceleration of a body moving along a circle is: a) $4\ T^2\ r / \pi^2$ b**) $4\pi^2 r / T^2$** c) $4\ r^2\ T^2 / \pi^2$ d) $4\ \pi^2 / T^2\ r$ **[2000]**	**$4\pi^2 r / T^2$**	**U**	**M**
118.	S.I unit of angular velocity is a) m/sec b) **Radians/ sec** c) Deg/ sec d) Rev/ sec **[2000]**	**Radians/ sec**	**K/R**	**D**
119.	When a body moves along the circumference with uniform speed change take place in its: a) **Liner velocity** b) Tangent acceleration c) Both d) rev/ sec	**Liner velocity**	**U**	**M**
120.	The expression for the time period of an object moving with constant speed ν along a circle of radius 'r' is given by: a) $4\ \pi\ r / \nu$ b) **$2\ \pi\ r / \nu$** c) $\pi\ r^2 / \upsilon$ d) $4\ \pi^2\ r / \upsilon$	**$2\ \pi\ r / \nu$**	**K/R**	**E**
121.	The rate of change of angular momentum with respect to time is: a) Force b) Angular velocity c) Angular acceleration **d) Torque** **[2006,19]**	**Torque**	**U**	**E**
122.	Two forces which are equal in magnitude but opposite in direction, not acting on the same line, constitute a: **a) Couple** b) Circle c) Power d) Force **[2006]**	**Couple**	**K/R**	**D**
123.	The S.I unit of angular momentum is: a) kg m/s b) kg ms **c) J-s** d) $J\text{-}s^{-1}$	**J-s**	**U**	**M**

	[2005]			
124.	A body in equilibrium a) Can move with constant acceleration b) is always at rest **c) Can move with constant velocity** **[2004 , 2018]**	**Can move with constant velocity**	**K/R**	**D**
125.	When the net torque acting on a system is zero, which of the following will be constant? a) Force **b) Angular momentum** c) Linear momentum **[2003 (P.E)]**	**Angular momentum**	**U**	**M**
126.	The physical quantity which produce angular acceleration is called: **a) Torque** b) Work c) Power d) Energy **[2002 (P.E)]**	**Torque**	**K/R**	**E**
127.	The gradational force between two bodies does not depend upon: a) **The sum of their masses** b) Their separation c) Product of their masses **[2005,19supply]**	**The sum of their masses**	**U**	**E**
128.	The ocean tides are caused by gravitational force exerting earth by: a) **Both the sun and the moon** b) Jupiter only. c) Moon only d) Sun only	**Both the sun and the moon**	**K/R**	**D**
129.	The equation which gives the magnitude of centripetal acceleration of the moon is: a) $\frac{4\pi^2 R}{T^2}$ b) $\frac{4\pi R}{T^2}$ c) $\frac{4\pi^2 R}{T}$ **[1990, 2008 , 11, 12]**	$\frac{4\pi^2 R}{T^2}$	**U**	**M**
130.	If we go up from the surface of the earth to a distance equal to the radius of the earth, the value of 'g' will be: a) $\frac{1}{2}g$ b) $\frac{1}{4}g$ c) 2 g d) 4 g **[2014, 09 , 03(P.M) , 90, 89]**	$\frac{1}{4}g$	**K/R**	**D**
131.	If a man goes to a height equal to the radius of the earth from its surface, his weight relative to that of earth would become: a) Half b) **One fourth**	**One fourth**	**U**	**M**

	c) Twice d) Same **[2002 (P.M)]**			
132.	Above the surface of the earth if we go to a distance equal to double the earth's radius the value of "g" will become. a) **One ninth** b) One-third c) One fourth d) One half	**One ninth**	**K/R**	**E**
133.	When the space ship is at a distance equal to twice of the earth's radius from its center then the gravitational acceleration is: a) 4.9 m/s^2 b) 19.6 m/s^2 c) **2.45 m/s^2**	**2.45 m/s^2**	**U**	**E**
134.	Acceleration due to gravity at the center of the earth is: a) **Zero** b) Maximum c) None of the these	**Zero**	**K/R**	**D**
135.	A hole is drilled through the earth along the diameter and a stone is dropped into it. When the stone is at the center of the earth it has: a) **Mass** b) Weight c) Acceleration	**Mass**	**U**	**M**
136.	The value of 'g' varies with radius of earth as it is: a) Inversely proportional to the radius of the earth b**) Inversely proportional to the square of the radius of the earth.** c) Directly proportional to the square of the radius of the earth **[2008]**	**Inversely proportional to the square of the radius of the earth.**	**K/R**	**D**
137.	If the mass of the earth becomes four times to its initial value, then the value of 'g' will be: a) Equal to its initial value b) **Four times to its initial value** c) One fourth of its initial value **[2015]**	**Four times to its initial value**	**U**	**M**
138.	If the mass becomes 4 times, the acceleration due to gravity will become: a) Half b) Double c) Threefold d) **Fourfold**		**K/R**	**E**
139.	The mass of a planet and its diameter are three times that of earth then the acceleration due to gravity on the surface of the planet will be: a) **One third on the earth's** b) Half on the earth's c) None of the these	**One third on the earth's**	**U**	**E**
140.	If a planet existed whose mass and radius were both twice that of the earth, then acceleration due to gravity at its surface would be: a) **4.9 m/s^2** b) 19.6 m/s^2	**4.9 m/s^2**	**K/R**	**D**

	c) 2.45 m/s^2 **[1990]**			
141.	If the radius of earth were to shrink its mass remaining the same, the acceleration due to gravity on the earth's surface would (i) Decrease (ii) **Increase** (iii) Remain the same. **[2003 (P.M) 90]**	**Increase**	**U**	**M**
142.	If the radius of the earth were to shrink by 1% while its mass remaining same, the acceleration due to gravity on the earth's surface would: a) Decrease b) Remain the same c) **Increase**	**Increase**	**K/R**	**D**
143.	What happens to the person's weight when he goes down to the bottom of deep mine compared to his weight on the surface? a) It will remain the same b) It will increase c) **It will decrease**	**It will decrease**	**U**	**M**
144.	The acceleration of free fall on moon is about one sixth of its value earth. If on the earth a body has mass 'm' and weight 'w', then on t moon, mass and weight will be respectively about: a) $\frac{m}{6}$ and $\frac{w}{6}$ b) $\frac{m}{6}$ and w c) $\mathbf{m \text{ and } \frac{w}{6}}$	$\mathbf{m \text{ and } \frac{w}{6}}$	**K/R**	**E**
145.	On the surface of the moon the weight of a person: a) Increases b) **Decreases** c) Remains the same	**Decreases**	**U**	**E**
146.	A person whose weight is 120 pound on the earth, on the moon his weight will be approximately: a) **20-pound** b) 30-pound c) 40 pound **[2013]**	**20-pound**	**K/R**	**D**
147.	The weight of a man is **600N** at the earth; his weight on the moon, where $g_m = \frac{g}{6}$, will be: a) 3600N b) 600N c) 300N d) ***100N***	***100N***	**U**	**M**
148.	If the distance between two masses is doubled, the gravitational force between them becomes: a) **One fourth of its original value** b) Half of its original value c) Four times of its original value	**One fourth of its original value**	**K/R**	**D**

	[2019]			
149.	Power is equal to: a) F x d / t b) F.V / t c) **F . d / t** d) F x V / t	**F . d / t**	**U**	**M**
150.	A man weighing 600 N climbs 5.0 m vertically upward in 8.0 seconds his rate of working is: a) 175 watt b) 275 watt c) **375 watt**	**375 watt**	**K/R**	**E**
151.	Watt may be defined as: a) Joule per coulomb b) **Joule per second** c) Newton meter **[2003 (P.E)]**	**Joule per second**	**U**	**E**
152.	A body executes simple harmonic motion if: (a) a = k . x (b) v = - k . x (c) **a = -** $\sqrt{k}$ **x** (d) a = - k . x^2 **[2009]**		**K/R**	**D**
153.	The value of elastic restoring force in case of a spring is: (a) K x (b) **– K x** (c) ½ K x (d) None of these **[2004]**	**– K x**	**U**	**M**
154.	The frequency of a simple pendulum is given by (a) $\upsilon = 2\pi\sqrt{g/L}$ (b) $\upsilon = 2\pi\sqrt{L/g}$ (c) $\upsilon = 1/2\pi\sqrt{L/g}$ (d) $\upsilon = 1/2\pi\sqrt{g/L}$ **[2008]**	$\upsilon = 1/2\pi\sqrt{g/L}$	**K/R**	**D**
155.	If the mass of a body in a spring is increased to 4 times, the period of vibration will be: (a) 4 times (b) **2 times** (c) $\sqrt{2}$ times (d) Same as before **[2008]**	**2 times**	**U**	**M**
156.	If the mass of a body in a spring is doubled, the period of vibration of the body becomes: (a) Double (b) Half (c) $\sqrt{2}$ **times** (d) four times	$\sqrt{2}$ **times**	**K/R**	**E**

	[2007]			
157.	If the bob of a vibration simple pendulum is suddenly detached from the string at its mean position, its path will be: (a) A straight line (b) A circle (c) **A parabola** (d) A hyperbola [2005]	**A parabola**	**U**	**E**
158.	The time period of a simple pendulum depends upon its (a) **Length** (b) Amplitude (c) Mass of the bob (d) Temperature [2015, 2013, 2003]	**Length**	**K/R**	**D**
159.	An object is executing simple harmonic motion. Its kinetic energy is maximum at its: (a) **Mean position** (b) Extreme position (c) Extreme position. (d) At any point [2003]	**Mean position**	**U**	**M**
160.	The frequency of a second's pendulum is: (a) 1 Hz (b) 2 Hz (c) **0.5 Hz** (d) None of these [2004]	**0.5 Hz**	**K/R**	**D**
161.	If the bob of a simple pendulum is replaced by another bob of double mass but of the same size, its time period. (a) Increases (b) Decreases (c) **Remains the same** (d) Becomes infinity [2004, 2003 P.E]	**Remains the same**	**U**	**M**
162.	The product of frequency and time period is: (a) **1** (b) 2 (c) 3 (d) 4 [2019]	**1**	**K/R**	**E**
163.	The time period of simple pendulum does not depend upon: (a) **mass** (b) length (c) acceleration due to gravity (d) both b and c [2019 SUPPLY)	**mass**	**U**	**E**
164.	The velocity of a sound in a gas increases with: (a) **Temperature** (b) Pressure (c) Loudness (d) Frequency	**Temperature**	**K/R**	**D**

	[2005]			
165.	Which one of the following properties of sound is affective by the change in temperature? (a) Amplitude (b) **Wavelength** (c) Frequency (d) Intensity	**Wavelength**	**U**	**M**
166.	When the temperature of air rises, the speed of sound waves increases because. (a) The frequency of the wave increases. (b) **The wavelength of the wave increase.** (c) Both the frequency and wavelength (d) Neither frequency nor wavelength increase	**The wavelength of the wave increase.**	**K/R**	**D**
167.	Which of the following phenomenon cannot be explained on the particle nature of light:? (a) Photoelectric effect (b) Compton's effect (c) Pair production (d) **Interference**	**Interference**	**U**	**M**
168.	Two light waves meet at time when one has the instantaneous amplitude A and the other has the instantaneous amplitude B. their combined amplitude is: (a) A + B (b)**Between (A + B) and - (A + B)** (c) A - B (d) Indeterminate	**Between (A + B) and - (A + B)**	**K/R**	**E**
169.	Double slit arrangement is suggested by Young is order to obtain: (a) Monochromatic light (b) Destructive interference (c) Constructive interference (d) **Phase coherence** **[2014, 2004]**	**Phase coherence**	**U**	**E**
170.	In Young's double slit experiment, the fringe spacing is: (a) $\frac{d\lambda}{L}$ (b) $\frac{\lambda L}{d}$ (c) $\frac{d}{\lambda L}$ (d) $L\ \lambda\ d$	$\frac{\lambda L}{d}$	**K/R**	**D**
171.	Two monochromatic waves of same wave length are traveling through a medium. They can interfere destructively provided their path difference is:	**5/2 λ**	**U**	**M**

	(a) 2λ (b) λ (c) **5/2** λ (d) 5λ			
172.	The phenomena of interference of light was first demonstrated by: (a) Newton (b) Einstein (c) **Thomas Young** (d) Michelson	**Thomas Young**	**K/R**	**D**
173.	In Young's double slit arrangement, the bright fringes obtained are of: (a) **Uniform intensity** (b) Non uniform width (c) Colored (d) Circular	**Uniform intensity**	**U**	**M**
174.	The distance between two consecutive nodes of a transverse stationary wave is equal to: **(a)** $\frac{\lambda}{2}$ (b) λ (c) $\frac{\lambda}{4}$ (d) 2λ	$\frac{\lambda}{2}$	**K/R**	**E**
175.	In Michelson interferometer, semi silvered plate is used to obtain. (a) Dispersion (b**) Phase coherence** (c) Monochromatic light (d) Unpolarized light	**Phase coherence**	**U**	**E**
176.	To replace a bright fringe by the next bright fringe in a Michelson interferometer, the movable mirror is moved through a distance equal to: (a) λ (b) **$\lambda/2$** (c) $\lambda/4$ (d) 2λ	**$\lambda/2$**	**K/R**	**D**
177.	Interferometers measures: (a) **Wavelength of light** (b) Thickness of thin objects (c) Illuminating power of light (d) Velocity of light in gases	**Wavelength of light**	**U**	**M**
178.	Bending of light around the obstacles is called: (a) Polarization (b) Interference (c) **Diffraction** (d) Refraction	**Diffraction**	**K/R**	**D**

179.	If 2000 lines /cm are ruled on a grating. Its grating element is (a) $5x10^{-4}$ m (b) $5x10^{-5}$ m (c) **$5x10^{-6}$ m** (d) $5x10^{-8}$ m	**$5x10^{-6}$ m**	**U**	**M**
180.	Diffraction of light is special type of. (a) Reflection (b) Refraction (c) **Interference** (d) Polarization	**Interference**	**K/R**	**E**
181.	When both the point source and the screen are placed at finite distance from the diffracting obstacle the phenomenon is called. (a) **Fresnel diffraction** (b) Fraunhofer diffraction	**Fresnel diffraction**	**U**	**E**
182.	In Fraunhofer's diffraction wave front used is: (a) Spherical (b) Circular (c) **Plane** (d) Conical	**Plane**	**K/R**	**D**
183.	The number of lines per cm of a diffraction grating is 4000. Its grating element is: (a) $2.5x10^{-6}$cm (b) $4x10^{2}$cm **(c) $2.5x10^{-4}$cm** (d) $4x10^{5}$ cm	**$2.5x10^{-4}$cm**	**U**	**M**