

WARNING	Any malpractice or any attempt to commit any kind of malpractice in the Examination will DISQUALIFY THE CANDIDATE.		
PAPER – I PHYSICS & CHEMISTRY–2016			
Version Code	A2	Question Booklet Serial Number :	5237666
Time : 150 Minutes	Number of Questions : 120		Maximum Marks : 480
Name of Candidate			
Roll Number			
Signature of Candidate			
INSTRUCTIONS TO THE CANDIDATE			
1. Please ensure that the VERSION CODE shown at the top of this Question Booklet is the same as that shown in the OMR Answer Sheet issued to you. If you have received a Question Booklet with a different Version Code, please get it replaced with a Question Booklet with the same Version Code as that of the OMR Answer Sheet from the Invigilator. THIS IS VERY IMPORTANT. 2. Please fill the items such as Name, Roll Number and Signature in the columns given above. Please also write Question Booklet Serial No. given at the top of this page against item 3 in the OMR Answer Sheet. 3. This Question Booklet contains 120 questions. For each question, five answers are suggested and given against (A), (B), (C), (D) and (E) of which only one will be the Most Appropriate Answer. Mark the bubble containing the letter corresponding to the 'Most Appropriate Answer' in the OMR Answer Sheet, by using either Blue or Black ball-point pen only. 4. Negative Marking: In order to discourage wild guessing, the score will be subjected to penalization formula based on the number of right answers actually marked and the number of wrong answers marked. Each correct answer will be awarded FOUR marks. ONE mark will be deducted for each incorrect answer. More than one answer marked against a question will be deemed as incorrect answer and will be negatively marked. 5. Please read the instructions given in the OMR Answer Sheet for marking answers. Candidates are advised to strictly follow the instructions contained in the OMR Answer Sheet.			
IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 120 QUESTIONS IN SERIAL ORDER. IF NOT, REQUEST FOR REPLACEMENT.			
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PLEASE ENSURE THAT THIS QUESTION BOOKLET CONTAINS
120 QUESTIONS SERIALLY NUMBERED FROM 1 TO 120.
PRINTED PAGES : 32

1. The one which does not represent a force in any context is
(A) friction (B) impulse (C) tension
(D) weight (E) viscous drag
2. The Work-Energy theorem states that the change in
(A) kinetic energy of a particle is equal to the work done on it by the net force
(B) kinetic energy of a particle is equal to the work done by one of forces acting on it
(C) potential energy of a particle is equal to the work done on it by the net force
(D) potential energy of a particle is equal to the work done by one of forces acting on it
(E) total energy of a particle is equal to the work done on it by the net force
3. A car of mass 1500 kg is lifted up a distance of 30 m by crane A in 0.5 minutes. The second crane B does the same job in 1 minute. The ratio of their powers is
(A) 1 : 2 (B) 2 : 1 (C) 1 : 1
(D) 1 : 4 (E) 4 : 1
4. Water from a hose pipe of radius 5 cm strikes a wall normally at a speed of 5 ms^{-1} . The force exerted on the wall in newton is
(A) 13.5π (B) 6.25π (C) 62.5π
(D) 27π (E) 125π

Space for rough work

5. The position vectors of two identical particles with respect to the origin in three dimensional co-ordinate system are $\vec{r}_1$ and $\vec{r}_2$. The position vector of centre of mass of the system is given by
- (A) $\vec{r}_1 + \vec{r}_2$ (B) $\frac{\vec{r}_1 - \vec{r}_2}{2}$ (C) $\vec{r}_1 - \vec{r}_2$
(D) $\frac{\vec{r}_1 + \vec{r}_2}{2}$ (E) $\frac{\vec{r}_1 + \vec{r}_2}{3}$
6. If a body of moment of inertia 2 kg m^2 revolves about its own axis making 2 rotations per second, then its angular momentum (in Js) is
- (A) 2π (B) 4π (C) 6π
(D) 8π (E) 10π
7. A rigid body is the one in which
- (A) it can have only rotational motion
(B) it can have only translational motion
(C) the distances between all pairs of particles of the body do not change
(D) its shape can be deformed
(E) its centre of mass always lies inside the material of the body
8. A body hanging from a massless spring stretches it by 3 cm on earth's surface. At a place 800 km above the earth's surface, the same body will stretch the spring by (Radius of earth = 6400 km)
- (A) $\left(\frac{34}{27}\right) \text{ cm}$ (B) $\left(\frac{64}{27}\right) \text{ cm}$ (C) $\left(\frac{27}{64}\right) \text{ cm}$
(D) $\left(\frac{27}{34}\right) \text{ cm}$ (E) $\left(\frac{35}{81}\right) \text{ cm}$

Space for rough work

9. The acceleration due to gravity on the surface of a planet is one-fourth of the value on earth. When a brass ball is brought to this planet, its
- (A) mass is halved
 - (B) weight is halved
 - (C) mass becomes one-fourth
 - (D) weight becomes one-fourth
 - (E) mass and weight remain the same
10. Polar satellites
- (A) are high altitude satellites
 - (B) are widely used for telecommunication
 - (C) are used for environmental studies
 - (D) go around the earth in a east-west direction
 - (E) have time-period of rotation of 24 hours
11. If a capillary tube of radius r is immersed in a liquid, the liquid rises to a height h . The corresponding mass of liquid column is m . The mass of water that would rise in another capillary tube of twice the radius is
- (A) $2m$
 - (B) $5m$
 - (C) $3m$
 - (D) $4m$
 - (E) $\frac{m}{2}$
12. In a horizontal pipe of non-uniform cross-section, water flows with a velocity of 1 ms^{-1} at a point where the diameter of the pipe is 20 cm. The velocity of water (in ms^{-1}) at a point where the diameter of the pipe is 5 cm is
- (A) 64
 - (B) 24
 - (C) 8
 - (D) 32
 - (E) 16

Space for rough work

