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TRINITY COLLEGE NABBINGO

END OF TERM I EXAMINATIONS

S.2 PHYSICS

TIME: 2 HOURS

INSTRUCTIONS

- *Answer **all** questions in both sections.*
- *The correct alternative in section **A MUST** be written in the table below.*
- *Answers to section **B** questions **MUST** be written in the spaces provided.*

ANSWER GRID FOR SECTION A

1.	11.	21.
2.	12.	22.
3.	13.	23.
4.	14.	24.
5.	15.	25.
6.	16.	26.
7.	17.	27.
8.	18.	28.
9.	19.	29.
10.	20.	30.

Turn Over

SECTION A

1. Fluid pressure can be measured using a;

   A. Barometer B. Manometer C. Hydrometer D. Lactometer

2. An engine rated 1000W raises water through a vertical height of 50m is 10s. Find the weight of water raised.

   A. $5\times10^{-1}N$ B. $2\times10^{2}N$ C. $2\times10^{1}N$ D. $5\times10^{3}N$

3. Which one of the following sets consists of brittle materials only?

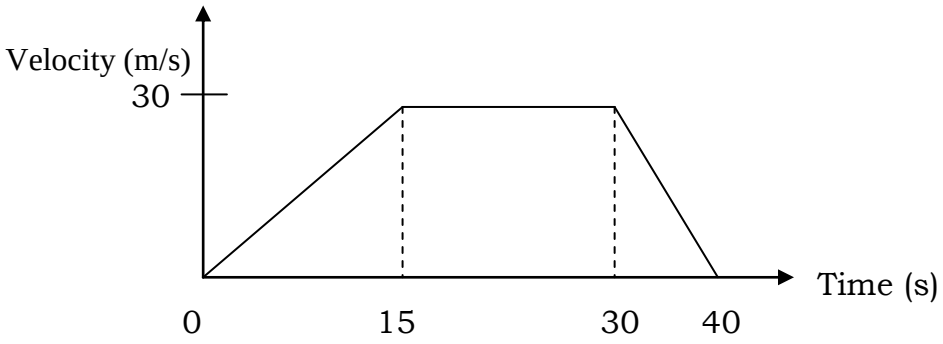
   A. Rubber and concrete B. Copper and wood
   C. Glass and concrete D. Chalk and plastic

4. Find the density of a rubber bung whose mass is 80g and volume 40cm^3.

   A. 0.5kgm^{-3} B. 2.0kgm^{-3} C. 3200kgm^{-3} D. 2000kgm^{-3}

5. Which one of the following has the lowest density?

   A. Steam B. Mercury C. mercury D. water

6. 

   Find the distance covered at constant velocity.

   A. $1.50\times10^{2}m$ B. $4.5\times10^{2}m$ C. $2.25\times10^{2}m$ D. $8.00\times10^{2}m$

7. When a copper II sulphate crystal is placed at the bottom of a test tube containing water, a dense blue solution is formed in the water at the bottom due to;

   A. surface tension B. capillarity
   C. diffusion D. Brownian motion

8. A force of 5N changes the momentum of a body from 50kgm/s to 250kgm/s. Find the time taken;

A. $1.7\times10^{-2}s$ B. $2.5\times10^{-2}s$ C. $6.0\times10^{1}s$ D. $4.0\times10^{1}s$

9. Solids are not easily compressed because their molecules;

A. are closely packed
B. are far apart
C. vibrate about their positions
D. are strongly held.

10. The energy which a body has by reason of its motion is;

A. Potential energy
B. kinetic energy
C. internal energy
D. chemical energy

11. The density of a substance is the;

A. volume of a given unit quantity of matter
B. pull of gravity on a substance
C. quantity of matter in unit volume
D. space occupied by a substance

12. A body moving at a velocity of 40m/s accelerates at a rate of $4m/s^2$ for 5 seconds. find the distance covered;

A. 50m B. 200m C. 300m D. 250m

13. A measuring cylinder of volume $39.25cm^3$ has a length of 0.5cm. find its radius in cm;

A. 5 B. 25 C. 0.2 D. 0.04

14. A body of mass 1500g is placed on a planet where the acceleration due to gravity is two-fifth that of the earth. Find the weight of the body on the planet.

A. $\frac{1500\times10}{5}$ B. $\frac{1500\times2\times10}{1000\times5}$

C. $\frac{1500\times5\times10}{1000\times2}$ D. $\frac{1500\times2\times10}{5}$

15. A body of mass 20kg develops a power of 20W after climbing steps for 80s. if each step is 20cm high, find the number of steps climbed;

A. 400 steps
B. 100 steps
C. 40 steps
D. 4 steps

16. A body of mass 10kg accelerates uniformly from rest to a velocity of 20m/s in 5s. Find the force acting on it;

A. 2.5N B. 4N C. 10N D. 40N

17. Which one of the following are second class levers?

(i) Sea saw (ii) wheel barrow
(iii) Pair of tongue (iv) Nut cracker

A. (i) and (iv) only B. (i) and (ii) only
C. (ii) and (iii) only D. (iii) and (iv) only

18. A body of mass 2kg is projected vertically upwards with a velocity of 10m/s. Find the maximum height reached;

A. 0.5m B. 5.0m C. 10.0m D. 50.0m

19. A needle floats on the surface of water because of;

A. adhesion B. viscosity
C. surface tension D. capillary attraction

20. A body of mass 30kg weighs 60N on planet X. which of the following statements is true?

A. The mass of the body is greater that it is on the earth
B. The acceleration due to gravity on X is less than that on earth.
C. The mass of the body is less on X than it is on the earth.
D. The acceleration due to gravity on X is greater than that on the earth.

21. A crane lifts mass of 500kg through a height of 12m in 5s. Find the power output.

A. $\frac{500\times10\times12}{5}W$ B. $500\times5\times12W$
C. $\frac{500\times12}{10\times5}W$ D. $\frac{500\times10\times5}{12}W$

22. When a body is raised above the ground its gravitation potential energy.

A. is lowered B. is raised
C. remains constant D. changes to kinetic energy

23. Find the force that would give a mass of 400g on acceleration of $8m/s^2$.

A. 0.5N B. 20.0N C. 3.2N D.50.0N

24. A razor blade floating on water sinks when a few drops of paraffin are added to the water because;

A. paraffin is denser than water
B. surface tension of water increases
C. cohesion of water molecules increases
D. surface tension of water reduced.

25. A body which is accelerating;

A. travels with increasing velocity
B. experiences zero force
C. decreases its velocity to zero
D. travels in a straight line

26. The recoil velocity of a gun will depend on;

(i) Mass of the shell
(ii) Velocity of the shell
(iii) Muzzle diameter of the gun
(iv) Mass of the gun

A. (i) only
B. (i), (ii) and (iv) only
C. (iii) only
D. (ii) and (iii) only

27. When oil of volume $6\times10^{-3}cm^3$ is dropped on a clean water surface, it forms a circular patch of one molecule of diameter 2cm. find the thickness of oil.

A. $14.32\times10^{-4}cm$
B. $.214\times10^{2}cm$
C. $4.77\times10^{-4}cm$
D. $1.91\times10^{-3}cm$

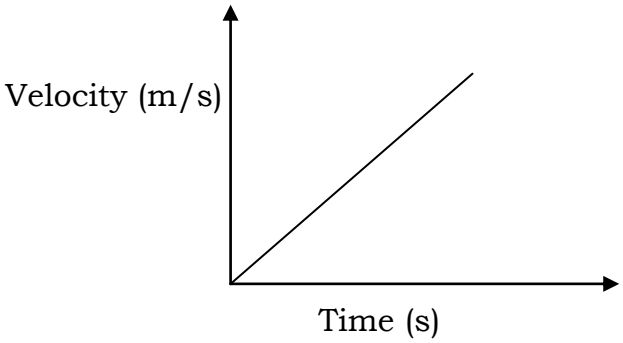
28. Gas leaking from a cylinder, at one corner of a room reaches another corner by way of;

A. evaporation
B. osmosis
C. Brownian motion
D. diffusion

29. The force that gives a body of mass 1kg an acceleration of $1ms^{-2}$ is called;

A. newton
B. friction
C. gravity
D. weight

30.



The velocity-time graph in figure above shows the motion of an object moving with;

A. decreasing acceleration
B. constant velocity
C. constant acceleration
D. increasing acceleration

SECTION B

31. (a) What is meant by

(i) Velocity of a machine? *(1 mark)*

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(ii) Pitch of a screw *(1 mark)*

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(b) A screw jack with a lever arm of 56cm and a pitch of 2.5mm is used to raise a load of 800N. If its efficiency is 25%, find;

(i) the velocity ratio *(3 marks)*

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(ii) mechanical advantage *(3 marks)*

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(c) Sketch a pulley system of VR = 5. *(2 marks)*

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32. (a) Define the following terms as applied to motion.

(i) Distance *(1mark)*

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(ii) Displacement *(1 mark)*

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(iii) Momentum *(1 mark)*

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(iv) Uniform acceleration *(1 mark)*

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(b) State Newton's laws of motion.

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(c) Write the ***three*** equations of linear motion. *(3 marks)*

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(d) A vehicle accelerates uniformly from rest to a velocity of 15m/s for 10 seconds. It maintains this speed for another 15 seconds and eventually comes to rest with a uniform deceleration after 7seconds.

(i) Sketch the velocity graph of the vehicle's journey above.

(2 marks)

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(ii) Calculate the total distance it travelled. *(3 marks)*

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33. (a) (i) Define moment of a force. *(1 mark)*

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(ii) State the principle of moments. *(1 mark)*

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(b) (i) State ***two*** applications of the principle of moments. *(2 marks)*

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(ii) Draw a diagram to show the forces acting on an object resting on a table. *(2 marks)*

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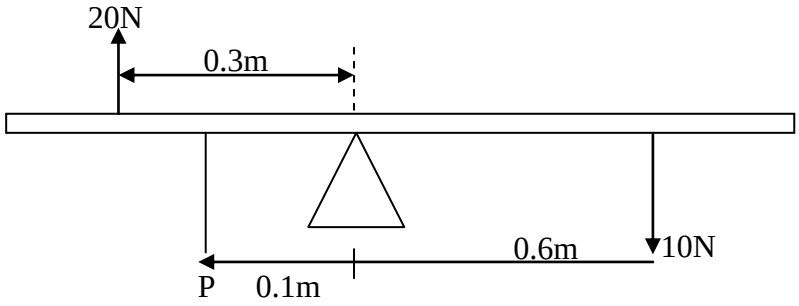
(c)



Forces of 20N, 10N and P act on a uniform rod pivoted at its centre ad shown above. Find the magnitude of P if the system is in equilibrium.

(4 marks)

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(d) Explain the following observation.

(i) When mercury and water are separately poured on glass, mercury doesn't wet glass but water does. *(2marks)*

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(ii) When a detergent is added to a clean water surface, a needle floating on it (water surface sinks) *(2 marks)*

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END