

535/1

PHYSICS

PAPER 1

AUGUST 2019

$2\frac{1}{4}$  HOURS



**ST. BRIDGET GIRLS HIGH SCHOOL**  
**END OF TERM II EXAMINATION 2019**

**S.1**

**PHYSICS**

**PAPER 1**

**TIME: 2HOURS:15MINUTES**

***Instructions to candidates***

- ❖ *Section A contains 40 objective type questions. You are required to write the correct answer A,B,C or D in the boxes at the right hand side*
- ❖ *Section B contains 10 structured questions. Answers are to be written in the spaces provided on the question paper.*
- ❖ *Acceleration due to gravity =  $10\text{ms}^{-2}$*

**For Examiners use only**

| Qn41 | Qn42 | Qn43 | Qn44 | Qn45 | Qn46 | Qn47 | Qn48 | Qn49 | Qn50 | MCQ | Total |
|------|------|------|------|------|------|------|------|------|------|-----|-------|
|      |      |      |      |      |      |      |      |      |      |     |       |
|      |      |      |      |      |      |      |      |      |      |     |       |

**SECTION A (40MARKS)**

**1. A stone is thrown vertically upwards. At the highest point , the stone**

- A. has maximum velocity**
- B. is starting to move downwards with no acceleration**
- C. is starting to move downwards with maximum velocity**
- D. has zero speed**

☐

**2. A stone of mass 20g falls through a distance of 10m. Calculate the kinetic energy it loses.**

- |                |                 |
|----------------|-----------------|
| <b>A. 0J</b>   | <b>B. 20J</b>   |
| <b>C. 200J</b> | <b>D. 2000J</b> |

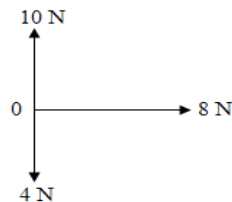
☐

**3. Which one of the following list contains vector quantities only?**

- A. Kinetic energy, potential energy, velocity**
- B. Acceleration, displacement, force**
- C. Displacement, kinetic energy, power**
- D. Time, velocity, density**

☐

**4. Forces of 10N, 8N and 4N acts on object, O as shown in fig. 2 . Find the magnitude of the resultant on O.**



- |                  |                  |
|------------------|------------------|
| <b>A. 10.0 N</b> | <b>B. 16.1 N</b> |
| <b>C. 22.0 N</b> | <b>D. 100.</b>   |

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5. The below figure shows Winnie a senior one girl in St Bridget on a swing .



Winnie will have

- A. maximum potential energy at P and R      B. maximum potential energy at Q ☐
- C. maximum kinetic energy at P      D. no kinetic energy at Q ☐

6. A thermopile is an instrument which converts

- A. heat energy to electrical energy  
B. electrical energy to light energy  
C. light energy to electrical energy  
D. chemical energy to heat energy

☐

7. A car of mass  $1.5 \times 10^3 \text{ kg}$  climbs a hill in 900s. If the top of the hill is 50m above the starting point find the average power output of the engine.

- A.  $1.38 \times 10 \text{ W}$       B.  $8.33 \times 10^2 \text{ W}$   
C.  $5.00 \times 10^3 \text{ W}$       D.  $50 \times 10^5 \text{ W}$

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8. An object of mass 2kg dropped from a top of a building hits the ground with a kinetic energy of 900J. the height of the building is

- A. 30m      C. 90m  
B. 45m      D. 180m

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9. The most suitable instrument for measuring the outer diameter of a test tube is

- A. a ruler.      B. a tape measure.  
C. vernier callipers.      D. a micrometer screw gauge.

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10. A crane raises a mass of 500 kg vertically upwards at a speed of  $10 \text{ ms}^{-1}$ . Find the power developed

- A.  $5.0 \times 10^0$       B.  $5.0 \times 10^1$   
C.  $5.0 \times 10^2$       D.  $5.0 \times 10^4$

☐

11. A girl whose mass is 50 kg runs up a staircase 25 m high in 4 s. Find the power she develops.

- A.  $\frac{50 \times 4}{25} \text{ W}$       B.  $\frac{50 \times 10}{25 \times 4} \text{ W}$   
C.  $\frac{50 \times 25}{4} \text{ W}$       D.  $\frac{50 \times 10 \times 25}{4} \text{ W}$

☐

12. A pump is rated at 400W. How many kilograms of water can it raise in one hour through a height of 72m?

- A. 0.8kg                      B. 5.6kg  
C. 33.3kg                    D. 2000kg

☐

13. A boy carrying a load of 6 kg runs upstairs. If the work that the boy does is 300 J, find the height of the stairs.

14. A. 3m                                              B. 5m

☐

- C. 6m                                              D. 10m

15. Which of the following statements is true about an electric motor? It changes

- A. Kinetic energy to electric energy                      B. Electrical energy to light energy  
C. Electrical energy to kinetic energy                    D. Chemical energy to electrical energy

☐

16. In which action(s) below is there a work done?

- I.        Pushing a wall without moving it.  
II.      Taking a book from a table to a higher shelf.  
III.     Walking on a bridge for 50 m

- A. I only                                              B. II only

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- C. III only                                            D. II and III only

17. Which of the following forms mechanical energy?

- A. Electrical energy and kinetic energy                    B. Potential energy and nuclear energy  
C. Nuclear energy and kinetic energy                    D. Potential energy and kinetic energy

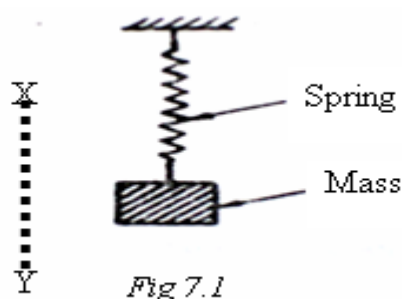
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18. An object, of mass 2kg, dropped from the top of a building hits the ground with kinetic energy of 900J. The height of the building is

- A. 30m                                              B. 45m  
C. 90m                                              D. 180m

☐

19. A mass attached to the end of a string moves up and down to maximum and minimum points X and Y as shown in figure 7.1 below.



When the mass is at X the

- A. kinetic energy is maximum, potential energy is minimum
  - B. kinetic energy is zero, potential is maximum
  - C. kinetic energy is equal to potential energy
  - D. kinetic energy and potential energy are both zero
20. A toy car is pulled with a force of 10 N for 5m. If the friction force between the block and the surface is 5N, what is the net work done on the toy car?



- A. 50 J
  - B. 100 J
  - C. 200 J
  - D. 25 J
21. Ali and Veli move identical boxes equal distances in a horizontal direction. Since Ali is a weak child, the time needed for him to carry his box is two times longer than for Veli. Which of the following is true for Ali and Veli.
- A. Ali does less work than Veli
  - B. Veli does less work than Ali.
  - C. Each does the same work.
  - D. Neither Ali nor Veli do any work
22. When water spreads on a glass plate, the forces between it's molecules and glass molecules are due to
- A. Surface tension
  - B. Adhesion
  - C. Cohesion
  - D. Viscosity

23. The particles in a solid at room temperature are

A. Close together and vibrating.    B. Close together and stationary.

C. Far apart and moving at random.    D. Close together and moving at random

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24. A bullet of mass 5g is fired at a speed of  $400\text{ms}^{-1}$ . How much energy does it have?

A.  $\frac{1}{2} \times 5 \times 10^2 \times 400\text{J}$

B.  $\frac{1}{2} \times 5 \times 10^3 \times 400\text{J}$

C.  $\frac{1}{2} \times 5 \times 10^{-3} \times 400 \times 400\text{J}$

D.  $\frac{1}{2} \times 5 \times 10^2 \times 400 \times 400\text{J}$

☐

25. Three of the fundamental physical quantities are:

A. Density, mass and time

B. Length, time and mass

C. Length, time and weight

D. Volume, density and mass

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26. Convert  $25\text{cm}^3$  into  $\text{m}^3$

A.  $02.5 \times 10^5$

B.  $2.5 \times 10^2$

C.  $2.5 \times 10^{-1}$

D.  $2.5 \times 10^{-5}$

☐

27. The width of a meter rule is accurately measured by a

A. micrometer screw gauge

B. vernier caliper

C. tape measure

D. meter rule

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28. The product of mass and acceleration is

A. Force

B. Inertia

C. Velocity

D. Momentum

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29. Which of the following decreases when a substance is heated?

A. Mass

B. Volume

C. Density

D. Weight

☐

30. The volume of  $10\text{cm}^3$  of liquid T of density  $0.7\text{g cm}^{-3}$  is mixed with  $15\text{cm}^3$  of another liquid M of density  $1.3\text{g cm}^{-3}$ . The two liquids mix completely with their volumes not changing. The density of the mixture is

A.  $0.94\text{g cm}^{-3}$

B.  $1.06\text{g cm}^{-3}$

C.  $1.00\text{g cm}^{-3}$

D.  $0.80\text{g cm}^{-3}$

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31. Which of the following is not elastic?

A. Glass

B. Rubber

C. Plasticine

D. Copper

32. A body of mass 20kg falls freely from a height of 5m. Find the velocity with which it hits the ground.

A.  $3.2 \text{ ms}^{-1}$

B.  $4.5 \text{ ms}^{-1}$

C.  $7.1 \text{ ms}^{-1}$

D.  $10.0 \text{ ms}^{-1}$

33. Mercury forms spherical drops when split on a wooden bench because it;

A. is very viscous

B. has a high density

C. has a high cohesive force

D. has a high adhesive force

34. If 10g water and  $10\text{cm}^3$  alcohol are mixed what will be the mass of the mixture?

(Density of alcohol =  $0.80 \text{ gcm}^{-3}$ )

A. 18g

C. 16g

B. 20g

D. 19g

35. Two litres of corn oil has a mass of 1.85kg. What is the density of the oil?

A.  $1850 \text{ kgm}^{-3}$

B.  $925 \text{ kgm}^{-3}$

C.  $185 \text{ kgm}^{-3}$

D.  $92.5 \text{ kgm}^{-3}$

36. What is the volume and mass of the block which measures by 2m, by 3m by 5m if its density is  $1500 \text{ kgm}^{-3}$ ?

A.  $50\text{m}^3$ ; 75 000 kg

B.  $100 \text{ m}^3$ ; 75 000 kg

C.  $30\text{m}^3$ ; 75 000 kg

D.  $30 \text{ m}^3$ ; 75 000 kg

37. A block of wood 10m x 5m x 4m has a mass of 80 000 kg. What is the density of this wood?

A.  $2000\text{kgm}^{-3}$

B.  $4000 \text{ kgm}^{-3}$

C.  $200 \text{ kgm}^{-3}$

D.  $400 \text{ kgm}^{-3}$

38. A box of dimensions 0.2m by 0.3m by 0.5m is full of a gas of density  $200\text{kgm}^{-3}$ . The mass of the gas is

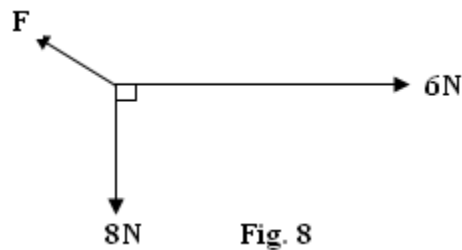
A.  $3 \times 10^{-2}\text{kg}$

B.  $6.0 \times 100\text{kg}$

C.  $2 \times 10^2\text{kg}$

D.  $6.7 \times 10^3\text{kg}$

39. Three forces act on a body as shown in the above figure



If the forces are in equilibrium, calculate F

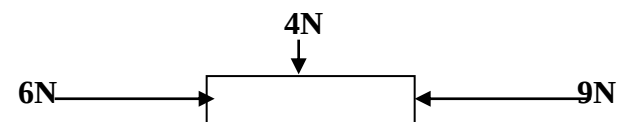
A. 20N

B. 14N

C. 10N

D. 3.7N

40.



A vertical force of 4N and horizontal forces of 6N and 9N were applied on a block as shown in the figure. Calculate the resultant force on the block.

A. 3N

B. 5N

C. 15N

D. 19N

**SECTION B (40 MARKS)**

*Attempt all questions in this Section*

**41.**

- a. State the law of conservation of mechanical energy (01mark)**

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- b. Write in the order of occurrence the energy changes which occur when an object falls from a point above the ground (02marks)**

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- c. Name on device which converts electrical energy to sound energy (01mark)**

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**42.**

- a. Define the joule. (01mark)**

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- b. The work done to move a body through a distance of 5m is 30J. Find the force that acts on the body. (03marks)**

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**43.**

- a. Define the term potential energy (01mark)**

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- b. A body of mass  $m$  kg is released from rest from a point  $h$  above the ground. Show that the velocity with which the body hits the ground is given by  $\sqrt{2gh}$  where  $g$  is the acceleration due to gravity (03marks)**

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44.

- a. Define the term Coefficient of frictional force (01mark)

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- b. State two factors which affect the magnitude of frictional force between two surfaces which are in contact (01mark)

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- c. A block of wood of mass 5 kg is placed on a table top. Find the limiting friction if the coefficient of friction is 0.5. (Take  $g = 10 \text{ m/s}^2$ ). (02marks)

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45.

- a. Define the following terms.

- i. Work. (01mark)

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- ii. Power. (01mark)

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- b. A crane lifts a load of 3500 N through a vertical height of 5 m in 5 second. Calculate:

- i. The work done. (01mark)

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- ii. The power developed by the crane. (01mark)

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46.

- a. Distinguish between renewable sources of energy and non renewable sources of energy (02marks)

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- b. Give four examples of each of the sources of energy above (02marks)

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47.

- a. Define a joule. (01mark)

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- b. A boy of mass 45 kg runs up a flight of 60 steps in 5 seconds. If each step is 12 cm. Calculate

- i. the work done against gravity by the boy. (01mark)

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- ii. The power developed by the boy. (01mark)

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48. Explain the following

- a. An oscillating pendulum comes to rest after sometimes (02marks)

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- b. The mass of the body remains unchanged as one move from the earth to the moon while the weight varies (02marks)

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49.

a. Define the term density

(01mark)

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b. Describe briefly how Cherry a senior one girl at St. Bridget high school would determine the density of her mathematical set.

(02marks)

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Given that the mass of her mathematical set is 164.5 g and when she immersed it in 300 cm<sup>3</sup> of water in a measuring cylinder, the level of water rose to 370 cm<sup>3</sup>. Help Leticia the determine the density of her mathematical set

(01mark)

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50.

a. 0.0018 m<sup>3</sup> of fresh water of density 1000 kgm<sup>-3</sup> is mixed with 0.0022 m<sup>3</sup> of sea water of density 1,025 kgm<sup>-3</sup>. Calculate the density of the mixture.

(02marks)

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b. Give any four differences between mass and weight (02marks)

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**SEE YOU NEXT TERM**