SMJK YU HUA
MID YEAR EXAMINATION 2014

Subject : Physics Paper 1
Form : 5A – 5F
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No. of printed pages : 11

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Name :_____
Class : _____

Answer all questions

1 Which of the following is a basic unit?
A Hertz
B Joule
C Watt
D Kelvin

2 Which of the following physical quantities is **not** a vector quantity?
A Pressure
B Force
C Mass
D Acceleration

3 Diagram 1 is a velocity-time graph showing the motion of an object.

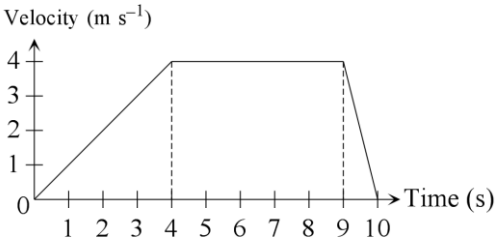


Diagram 1

Calculate the total distance, in m, travelled by the object in 10 s.
A 100
B 60
C 40
D 30

4 Diagram 2 shows a box with a mass of 10 kg is pushed forward by a force of 65 N. The frictional force between the box and the floor is 5 N.

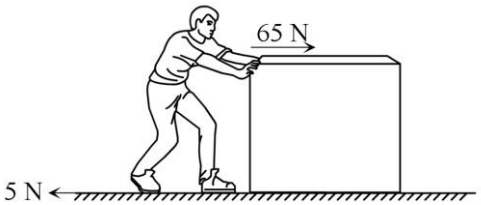


Diagram 2

Calculate the acceleration of the box.
A 6 m s^{-2}
B 13 m s^{-2}
C 70 m s^{-2}
D 325 m s^{-2}

5 Diagram 3 shows a mattress is used in a high jump event.

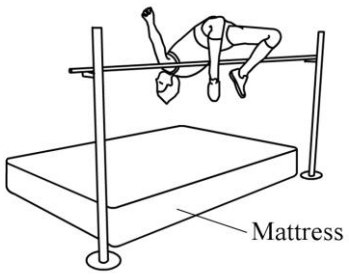


Diagram 3

What is the function of the mattress?
A To shorten the impact time between the athlete and the mattress
B To reduce the change of momentum of the athlete when the athlete lands on the mattress
C To increase the change of momentum of the athlete when the athlete lands on the mattress
D To reduce the impulsive force acting on the athlete when the athlete lands on the mattress

6 A ball falls from a height of 80 m.
Calculate the time taken for the ball to reach the ground.

A 3.50 s
B 4.00 s
C 4.30 s
D 4.40 s

7 Diagram 4 shows two loads, *S* and *T*.

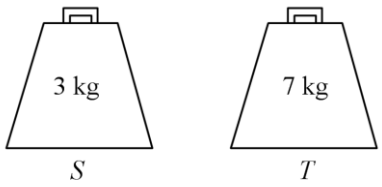


Diagram 4

Which statement is correct when *S* and *T* are in free fall?

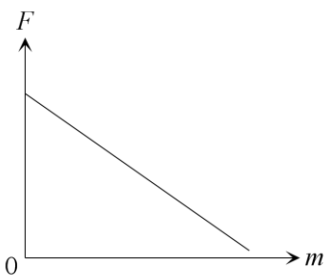
A The impulses acting on *S* and on *T* are the same
B The accelerations of *S* and *T* are the same
C The velocities of *S* and *T* are the same
D The momentum of *S* and *T* are the same

8 Diagram 5 shows a durian falling from a tree.

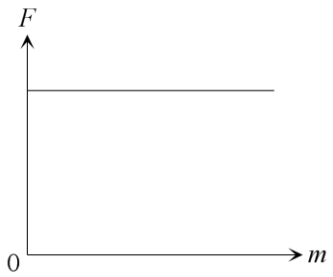
Diagram 5

Which of the following graphs shows the relationship between the gravitational force, *F*, acting on the durian and the mass, *m*, of the durian?

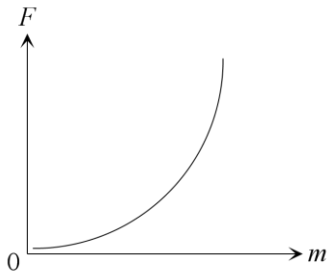
A



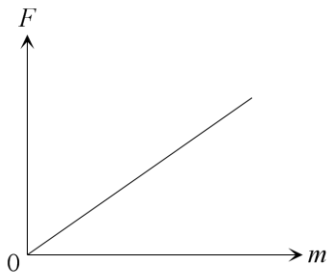
B



C



D



9 Diagram 6 shows a metal sphere of mass 3 kg sliding down a smooth slope and stop at point *Q*.

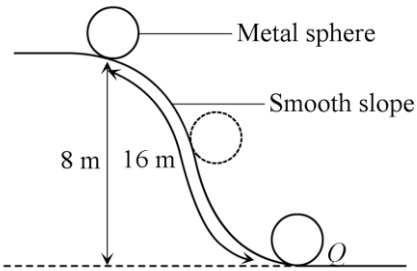


Diagram 6

What is the work done by the metal sphere?

A 30 J
B 48 J
C 240 J
D 480 J

10 Diagram 7 shows a trolley being released on a smooth plane.

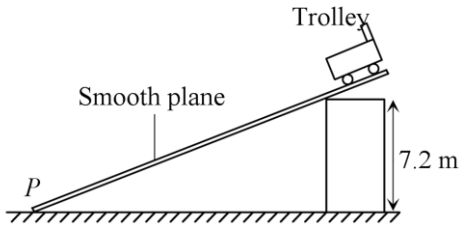


Diagram 7

Calculate the velocity of trolley at *P*.

A 144.0 m s^{-1}
B 72.0 m s^{-1}
C 36.0 m s^{-1}
D 12.0 m s^{-1}

11 Diagram 8 shows a boy with mass 65 kg climbing up a tree at a height of 8 m in 100 s.

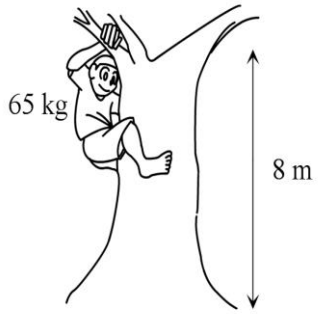


Diagram 8

Calculate the power generated by the boy.

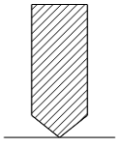
A 5 W
B 26 W
C 52 W
D 50 W

12 Which of the following phenomena experiences forces in equilibrium?

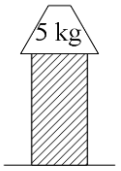
A A rockets accelerates upwards
B A ship floating at rest in the sea
C A durian falling from a tree
D A car descending a hill at an increasing velocity

13 Which of the following wooden rods of the same mass exerts the highest pressure on the floor?

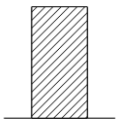
A



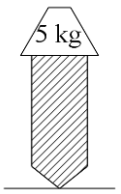
B



C

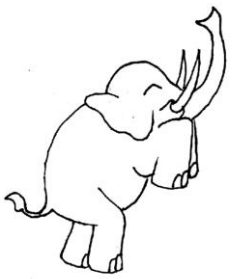


D

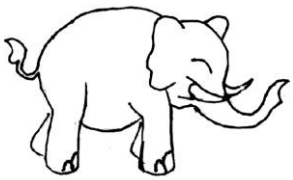


14 Which posture of elephant exerts the maximum pressure on the floor?

A

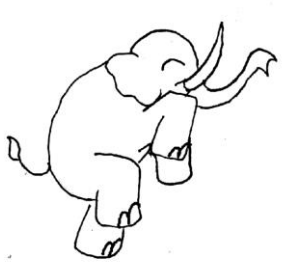


B



C

D



15 170 g of soft drink is mixed with 200 cm^3 of water. The volume of the mixture becomes 400 cm^3.
Calculate the density of the mixture.
[Density of water is 1 g cm^{-3}]

A 0.43 g cm^{-3}
B 0.50 g cm^{-3}
C 0.93 g cm^{-3}
D 1.08 g cm^{-3}

16 Diagram 9 shows a fish in the sea.

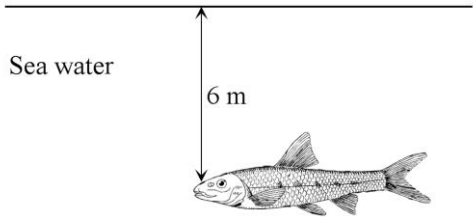


Diagram 9

Calculate the pressure exerted by the water on the fish.
[Density of water = 1 000 kg m^{-3}]

A 6×10^4 Pa
B 6×10^9 Pa
C 6×10^3 Pa
D 6×10^2 Pa

17 The density of substance *X* is 5.80×10^3 kg m^{-3}. Substance *X* will sink in the liquid

	Liquid	Density of liquid/ kg m^{-3}
A	*P*	5.87×10^3
B	*Q*	1.53×10^4
C	*R*	5.60×10^3
D	*S*	2.64×10^4

18 Diagram 10 shows a manometer connected to a container filled with gas.

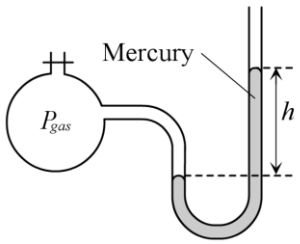


Diagram 10

What is the pressure, P_{gas}, inside the container?
[p = density of mercury, g = gravitational acceleration, P_{atm} = atmospheric pressure]

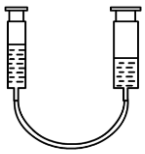
A $P_{gas} = hpg - P_{atm}$
B $P_{gas} = P_{atm} - hpg$
C $P_{gas} = P_{atm} + hpg$
D $P_{gas} = hpg$

19 Which statement explains why gases are more compressible than solids?

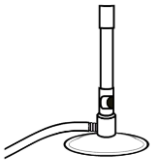
A The distance between gas molecules is larger than the distance between solid molecules
B The force between gas molecules is larger than the force between solid molecules
C The density of gas molecules is larger than the density of solid molecules
D The mass of gas molecules is larger than the mass of solid molecules

20 Which of the following apparatus uses the Pascal's principle?

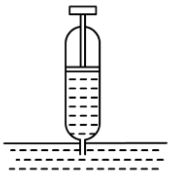
A



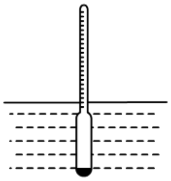
B



C



D



21 What is the maximum temperature increase of the water at the bottom of a 907 m waterfall? [Gravitational force, G = 10 m s^{-2}, specific heat capcity of water = 4.2×10^3 J kg^{-1}°C]

A 0.22°C
B 0.46°C
C 2.16°C
D 4.63°C

22 The air pressure in a container is 169 kPa at a temperature of 35°C.
What is the air pressure in the container at a temperature of 54°C?
[Assume the volume of the air pressure in the container is constant]

A 110 kPa
B 159 kPa
C 179 kPa
D 261 kPa

23 Diagram 11 shows the condition of a bottle which initially contains hot air, before and after being put into a basin of ice.

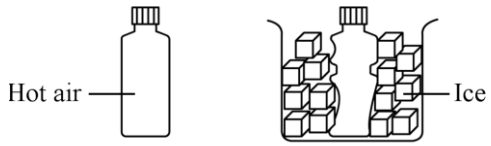


Diagram 11

Which of the following laws explained the situation?

A Euler's law
B Newton's law
C Charles's law
D Boyle's law

24 Diagram 12 shows the apparatus used to investigate the relationship between the length, ℓ, and the temperatre, T, of the trapped air.

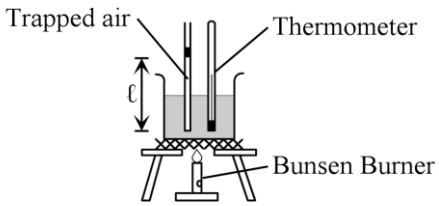
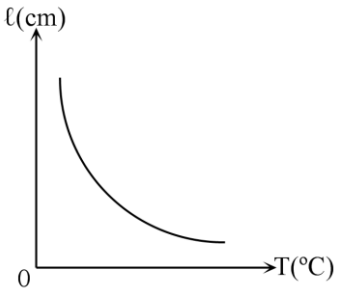


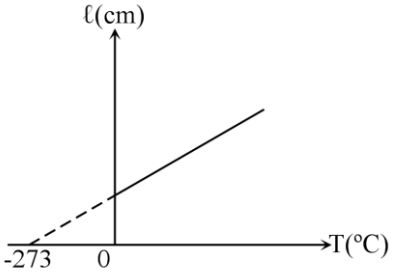
Diagram 12

Which of the following graphs shows the relationship between ℓ and T?

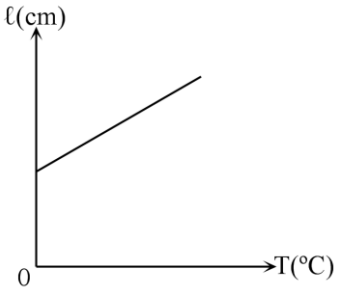
A



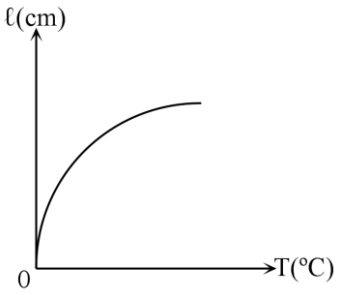
B



C



D



25 Diagram 13 shows a student looking at the image of a ball in a plane mirror.

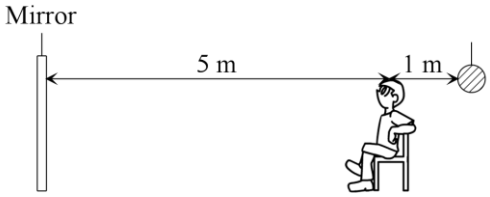


Diagram 13

Calculate the distance, in m, of the image from the student.

A 12
B 11
C 10
D 6

26 Diagram 14 shows two lorries, *M* and *N*, travelling in the opposite directions, pasing through a sharp bend.

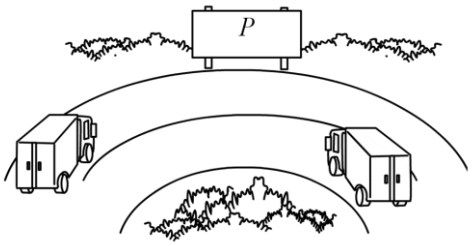
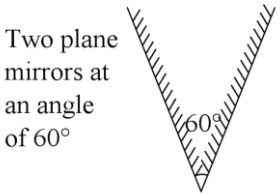


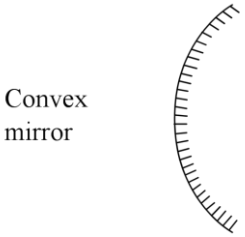
Diagram 14

Choose the mirror that is most suitable to place at *P* so that the driver in lorry *M* can see the lorry *N*.

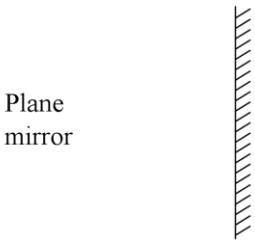
A



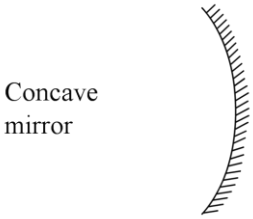
B



C



D



27 Diagram 15 shows a student sitting 10 m in front of a plane mirror.

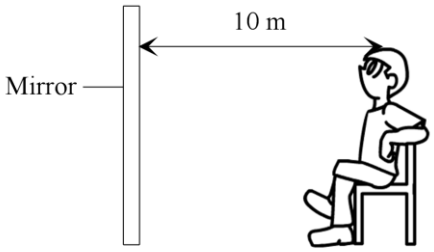


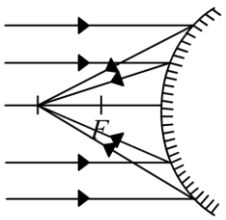
Diagram 15

If the mirror is moved 6 m towards the student, what is the distance between the student and his image?

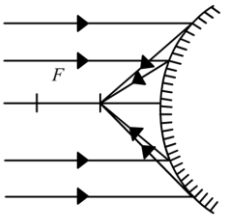
A 20 m
B 10 m
C 8 m
D 4 m

28 Which of the following diagrams shows the correct reflection of light from a convex mirror? [*F* is the principal focus]

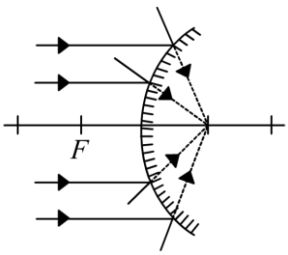
A



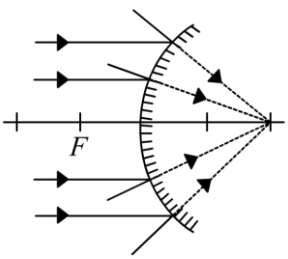
B



C



D



29 Diagram 16 shows a ray of light travelling from air to liquid *X* at an angle of incidence of 50°.

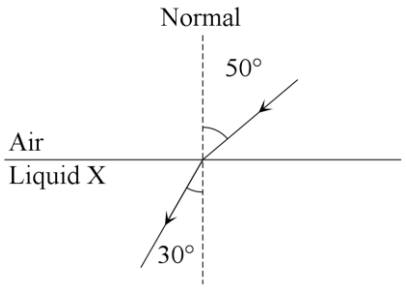


Diagram 16

Find the refractive index liquid *X*.

A 1.53
B 1.27
C 0.65
D 0.38

30 Diagram 17 shows a ray of light travelling from medium *S* to medium *T*.

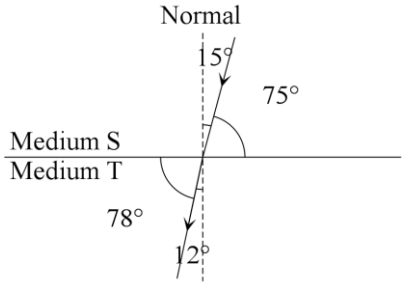


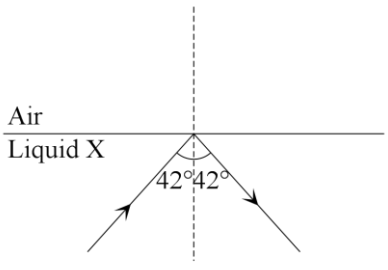
Diagram 17

Find the refractive index of the medium *T*.

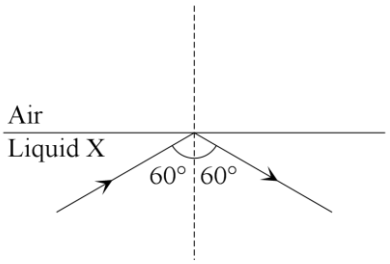
A 4.65
B 1.24
C 0.99
D 0.26

31 Which of the following diagrams shows the total internal reflection if the critical angle of liquid *X* is 46°?

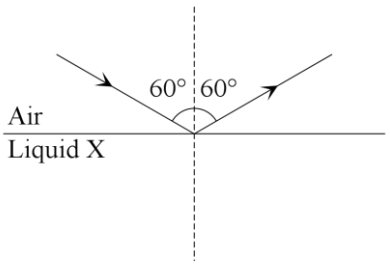
A



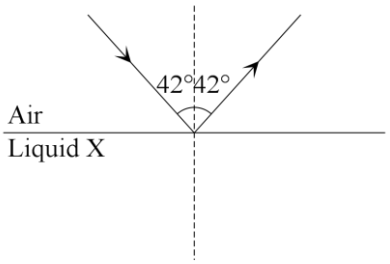
B



C



D



32 Diagram 18 shows a light ray, *X*, directed into a glass block. The critical angle of the glass block is 46°.

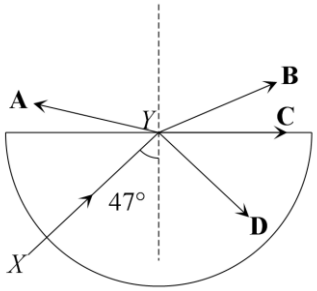
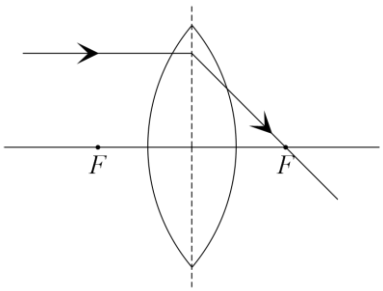


Diagram 18

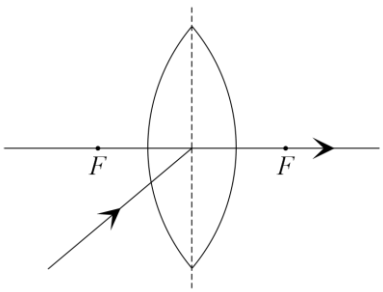
Which ray, **A**, **B**, **C** or **D** is the correct ray after the ray of light *X* struck point *Y*?

33 Which of the following diagrams shows the correct path of a light ray passing through a lense?
[*F* is the focal point of lense]

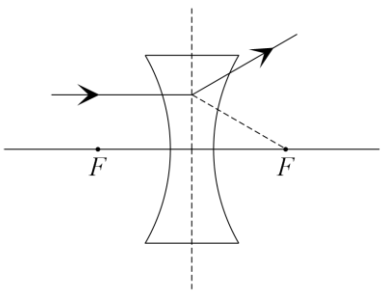
A



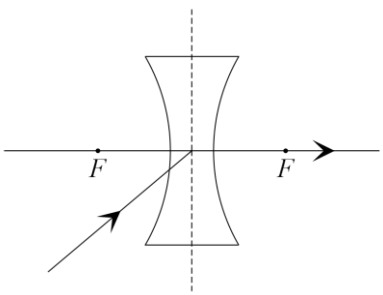
B



C



D



34 Which of the following conditions is required for a lens to be used as a magnifying lens?
[*f* = focal length]

	Type of lens	Objects distance
A	Concave	Between *f* and 2*f*
B	Concave	Less than *f*
C	Convex	Less than *f*
D	Convex	More than *f*

35 Diagram 19 shows the formation of the image of an object by a convex lens.

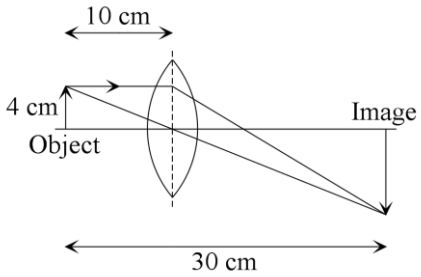


Diagram 19

Given that the height of the object is 4 cm, find the height of the image.

A 12.00 cm
B 8.00 cm
C 3.00 cm
D 2.00 cm

36 Diagram 20 shows a load oscillating on a spring.

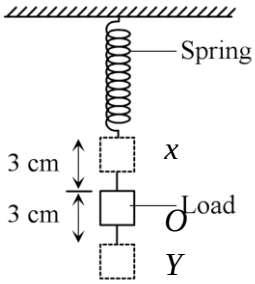
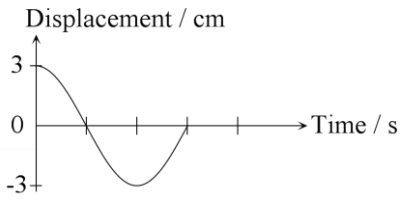


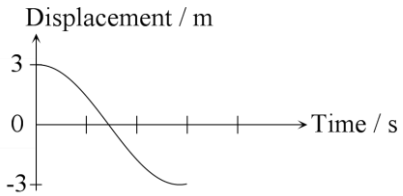
Diagram 20

Which of the following displacement-time graphs represents the oscillation of the load from position *X* to position *Y*, and back to position *O*?

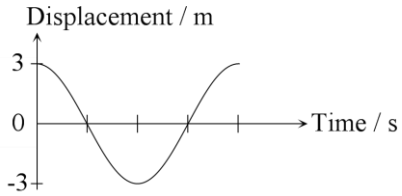
A



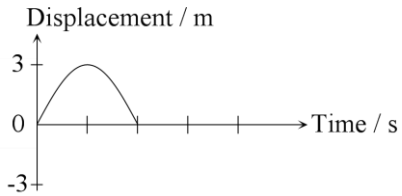
B



C



D



37 Which statement is correct when a wave is reflected by a reflector?

A The amplitude of wave before and after reflection is the same

B The frequency of wave becomes smaller after reflection

C The wavelength of wave becomes longer after reflection

D The speed of wave becomes faster after reflection

38 Diagram 21 shows water waves passing through a gap.

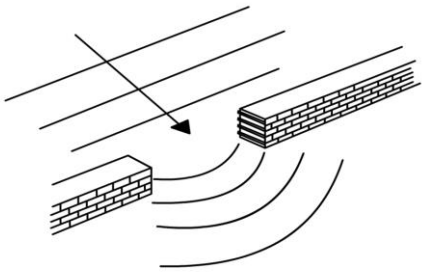


Diagram 21

The phenomenon which can be used to explain the propagation of waves is

A Interference

B Diffraction

C Refraction

D Reflection

39 Diagram 22 shows water waves passing a big rock in a sea.

Diagram 22

The phenomenon which can be used to explain the propagation of waves is

A Refraction

B Reflection

C Diffraction

D Interference

40 Diagram 23 shows the fringers formed on the screen when red light is used in a Young's double slit experiment.

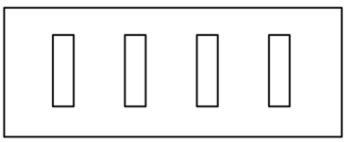
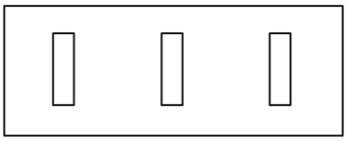


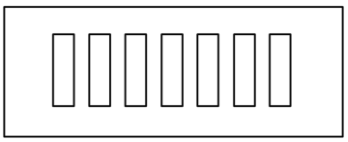
Diagram 23

Which of the following fringers are observed when the red light is replaced by blue light?

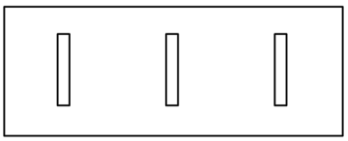
A



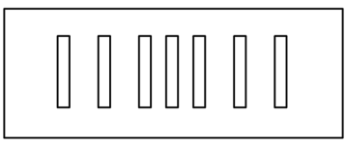
B



C



D



41 Diagram 24 shows the interference wave patterns formed by waves from two coherent sources, *X* and *Y*.

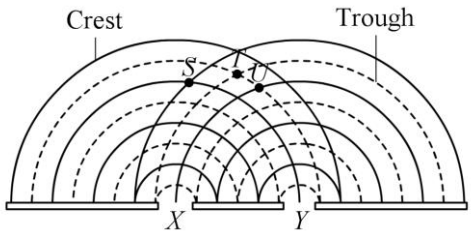


Diagram 24

Which combination is correct?

	Constructive interference	Destructive interference
A	*S*	*U*
B	*S*	*T*
C	*T*	*S*
D	*U*	*T*

42 A radar transmits a sound wave to find the depth of a wrecked ship. If the reflected sound wave is detected 0.3 s, calculate the depth of the wrecked ship.
[Velocity of sound wave in water = 1 552 m s^{-1}]
A 232.8 m
B 465.6 m
C 2 328.0 m
D 4 656.0 m

43 A radar transmits a signal towards an aeroplane. After 4.1×10^{-3} s, the radar detects the reflected signal.
Calculate the distance of the aeroplane from the radar.
[Velocity of the signal = 3.1×10^{8} m s^{-1}]
A 2.5×10^{6} m
B 1.3×10^{6} m
C 6.4×10^{5} m
D 3.2×10^{5} m

44 The electric current supplied by a battery in a circuit is 8.0×10^{-3} A.
What is the quantity of charge that flows in 3 hours?
A 2.7×10^{-3} C
B 2.4×10^{-2} C
C 1.4 C
D 8.6 × 0 C

45 The factor that does **not** influences the resistance of a wire is
A the cross-sectional area of the wire
B the material of the wire
C the age of the wire
D the length of the wire

46 Diagram 25 shows an electric circuit.

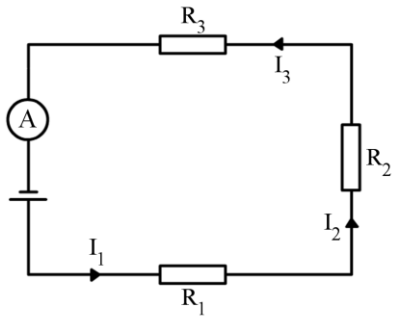


Diagram 25

Which of the following is correct?
A $I_1 < I_2 < I_3$
B $I_1 < I_2 = I_3$
C $I_1 = I_2 = I_3$
D $I_1 > I_2 < I_3$

47 Diagram 26 shows an electric circuit.

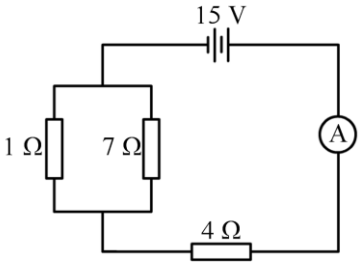


Diagram 26

The reading on the ammeter is
A 1.25 A
B 2.92 A
C 3.08 A
D 40.00 A

48 Diagram 27 shows an electric circuit.

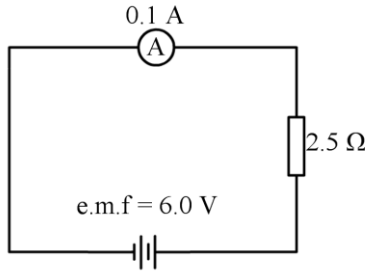


Diagram 27

What is the internal resistance of the battery in the circuit?

A 2.30 Ω
B 57.50 Ω
C 59.00 Ω
D 61.00 Ω

49 The electromotive force of a dry cell is

A the energy generated by the dry cell
B the energy per unit charge generated by the dry cell
C the charge generated by the dry cell
D the current generated by the dry cell

50 Diagram 28 shows an electric circuit.

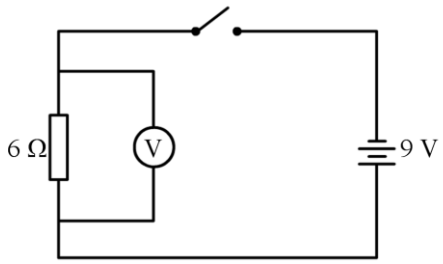


Diagram 28

How much power is dissipated in the resistor when the switch is closed?

A 0.7 W
B 1.5 W
C 13.5 W
D 54.0 W

SMJK YU HUA
MID YEAR EXAMINATION 2014

Subject : Physics
Form : 5A – 5F
Date : 22.5.2014 / Thursday
Time : 10.45 – 12.00 tgh
No. of Candidates : 278
No. of printed pages : 11

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Checked by : En Tan Kok Tong
Approved by : En Pradeep Kumar C
(Head of Physic Panel)
Verified by : Pn Lew Poh Peng
(Head of Science & Maths Department)
Verified by : Pn Ean Yong Moon
(Senior Assistant for Administration)

Name :_____
Class : _____

Answer:

1 D	**2** C	**3** D	**4** A	**5** D
6 B	**7** B	**8** B	**9** C	**10** D
11 C	**12** B	**13** D	**14** D	**15** C
16 A	**17** C	**18** C	**19** A	**20** A
21 C	**22** C	**23** C	**24** B	**25** B
26 B	**27** C	**28** C	**29** A	**30** B
31 B	**32** D	**33** A	**34** C	**35** B
36 A	**37** A	**38** B	**39** C	**40** B
41 A	**42** A	**43** C	**44** D	**45** C
46 C	**47** C	**48** B	**49** B	**50** C