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2017 Past GCE Ordinary Level Paper 1

Section 1 (forty two questions)

Directions: *each of the statements in this section is followed by four suggested answers. Select the best answer for each question*

Questions 1 – 42

1. A couple can be defined as
   A. The product of force and perpendicular distance from the pivot
   B. The product of perpendicular force and distance from the pivot
   C. Two equal forces acting in the same direction
   D. Two equal forces acting at different points in opposite directions
2. Which of the following properties of solid will change if it were transported from the earth to the moon
   A. Mass C. Density
   B. Weight D. Surface area
3. Identify the pair of forces that are all non contact forces from the pairs below
   A. Weight and up thrust
   B. Frictional force and electrostatic force
   C. Air resistance force and tension force
   D. Magnetic force and weight
4. Compensating for friction on a runway means
   A. Reducing frictional forces to zero
   B. Raising one end of the run way
   C. Adjusting the run way to balance friction with an equal but opposite force
   D. Ignoring frictional forces along the run way
5. A trolley of fixed mass undergoes an acceleration of 5 ms^{-2} when a force of 15 N is applied. Assuming no external force acts on the system, what force will give the trolley an acceleration of 3ms^{-2}?
   A. 15 N B. 12 N C. 9 N D. 20 N
6. A spring balance reads 36.4 N when a mass hangs from it in air, and 32.0 N when the same mass hangs from it in a liquid. The up thrust on the mass in the liquid is
   A. 68.4 N B. 4.4 N C. 34.2 N D. 2.2 N
7. The acceleration of a moving body is defined as
   A. The rate of change of displacement
   B. The rate of change of velocity
   C. The rate of change of displacement with time
   D. The rate of change of velocity with time
8. A graph of velocity against time is plotted for a car of mass 800 kg moving from one station to another. The area under the line and the time axis gives
   A. The acceleration of the car
   B. The average speed of the car
   C. The distance covered by the car
   D. The momentum of the car
9. During a handball match, a ball of mass 60 kg running at a velocity of 4 ms-1 collides with another boy of mass 70 kg running at a velocity of 3 ms-1 towards him. The total momentum of the two boys before collision in kgms-1 is
   A. 30 B 210 C. 240 D. 450

10. A body accelerating from rest with an acceleration of 2 ms^{-2}. When it has travelled a distance of 9 m its speed will be
    A. 2 B 6 C 3.5 D 18
11. Which of the graphs in figure 1 below shows the relationship between the velocity Y of an object falling freely near the surface of the earth and time X?

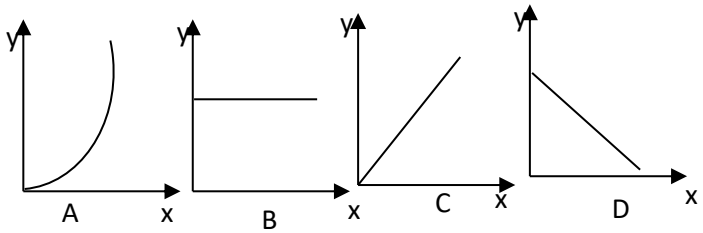
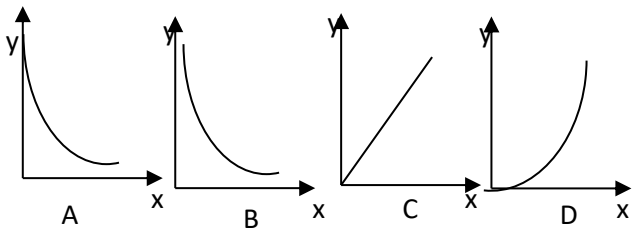


Figure 1

12. Which of the following pairs is made of only renewable sources of energy?
    A. Geothermal, sunlight C. Coal, wind
    B. Tide, natural gas D. Petrol, wood
13. Which of the following energies is possessed by a stretched rubber band?
    A. Heat energy
    B. sound energy
    C. Electrical energy
    D. Potential energy
14. The energy transferred from an object to another when there is a difference in temperature is
    A. Heat energy
    B. Potential energy
    C. Kinetic energy
    D. Electrical energy
15. Which of the following statements about energy conversion is true?
A. An electric motor converts kinetic energy to electrical energy
B. A loudspeaker converts electrical energy to sound energy
C. An electric heater converts heat energy to electrical energy
D. A burning log of wood converts potential energy to heat energy
16. Hydraulic machines use oil instead of water because
    A. Oil is less viscous
    B. Oil is incompressible
    C. Oil is translucent
    D. Oil prevents rusting
17. The SI unit of pressure is
    A. Pascals (Pa)
    B. Millimeters of mercury (mmHg)
    C. Bars (Ba)
    D. Atmospheres (atm)
18. When the cutting edge of a knife is sharpened it cuts easier because it exerts
    A. More pressure on the object
    B. Less pressure on the object
    C. Less force on the object
19. The temperature of a body is 360 K. what is this value in degree Celsius?

A. 87 B 186 C 273 D 260

20. A stone of mass 250 g displaced water in a measuring cylinder from 35 cm^3 mark to the 90 cm^3 mark. Its density in g cm^{-3} is
A. 7.14 B. 4.55 C. 2.78 D. 0.22
21. Which of the graphs in figure 2 best shows the relationship between the pressure Y and depth X of water in a pond



Figure

22. When water at 100^{0}C is heated to turn to vapour
A. The mass of the water increases
B. The kinetic energy of its molecules remain the same
C. The potential energy of its molecules decreases
D. The density of the water increases
23. Why is it important to lag the calorimeter and its contents when measuring the specific heat capacities of solids and liquids?
A. To ensure even distribution of heat
B. To ensure good electrical contact
C. To measure accurate temperature changes
D. To prevent heat loss to the environment
24. The lower fixed point of a mercury thermometer is
A. The temperature of mercury at standard atmospheric pressure
B. The temperature of pure melting ice
C. The temperature of pure boiling water at standard atmospheric pressure
D. The temperature of pure melting mercury
25. The lower and upper fixed point of a non graduated thermometer are at the 6 cm and 42 cm marks respectively. The fundamental interval of the thermometer is
A. 36 cm B. 42 cm C. 48 cm D 6 cm
26. How many joules of heat energy are supplied by an electric heater rated 8 kW in 10 s?
A. 0.8J B. 80J C. 8000J D. 80000J
27. An object of mass 1.5 kg has a specific heat capacity of 450 Jkg-1K-1. What quantity of heat energy is needed to raise its temperature from 296K to 316K?
A. 13500J C. 3000 J
B. 1350 J D. 135000J
28. A positively charged glass rod is one which has
A. Gained protons
B. Lost protons
C. Gained electrons
D. Lost electrons
29. A radio set is rated 12V 100W. A fuse that can be used to protect the radio set must have a value of
A. 12 A B. 8 A C. 9 A D. 10 A
30. Three 2Ω resistors are connected as shown in figure 3 below

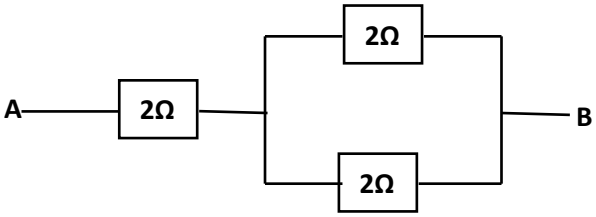
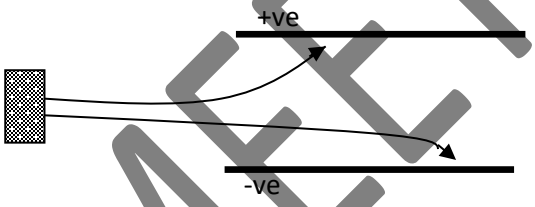


Figure 3

The combined resistance across AB is

A. 2Ω B. 3Ω C. 4Ω D. 6Ω

31. Which of the following rules can be used to determine the magnetic field direction about a straight current-carrying conductor?
    A. Cork screw rule
    B. Fleming's left hand rule
    C. Fleming's right hand rule
    D. Left hand grip rule
32. A material that is easily magnetized and demagnetized is referred to as
    A. An electromagnet
    B. A hard magnetic material
    C. A soft magnetic material
    D. A non-magnetic material
33. A transformer is used to operate a 24 V radio from a 240 V mains supply. Which of the following statements is true?
    A. The input current in the transformer is directly
    B. The transformer has more turns in the secondary than in the primary
    C. The transformer is a step-down transformer
    D. The turns ratio Ns/Np of the transformer is 10:1
34. Isotopes of the same element have different numbers of
    A. Electrons C. ions
    B. Protons D. neutrons
35. Two nuclear radiations X, and Z are passed through an electric field as shown in figure 4



The radiations are

A. X= alpha , Z = Gamma
B. X= Beta, Z = Gamma
C. X= Beta, Z = Alpha
D. X= Alpha, Z= Beta

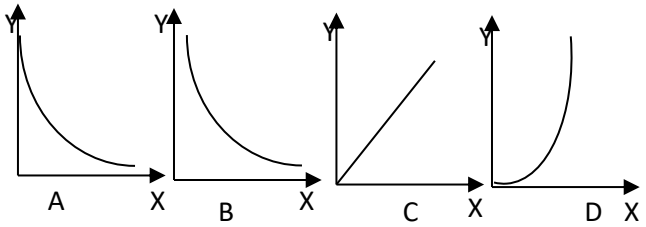
36. Radium – 226 decays a daughter nuclide by the emission of two particles according to the following equation:

N

The value of Z is

A. 86 B 84 C 90 D 92

37. Which of the following statements about gamma rays is correct?
    A. They carry a negative charge
    B. They are deflected by electric field
    C. They are the least penetrating
    D. They are not deflected by magnetic fields
38. Which of the graphs in figure 5 best shows the relationship between the activity Y of a radioactive substance and the time of decay X?



Figure

39. A student stands 10.0 cm in front of a plane mirror and sees his image in the mirror. How far is he from his image?
    A. 5.0cm B. 10.0cm C. 20.0cm D 100.0cm
40. The image formed by a convex lens used a magnifying glass is
    A. Upright, real and larger than the object
    B. Upright, real and smaller than the object
    C. Upright, virtual and larger than the object
    D. Upright, virtual and smaller than the object

41. A ray of light is reflected by a mirror as shown in figure 6

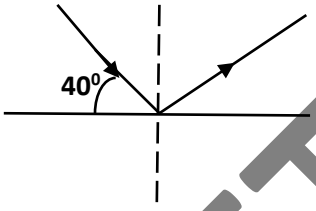
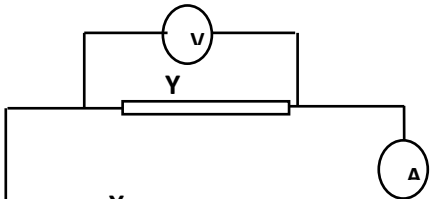


Figure 6

The angle of reflection is
    A. 40^0 B. 50^0 C. 90^0 D. 100^0
42. When an object is placed beyond 2F in front of a diverging (concave) lens, the image formed has the following characteristics
    A. Virtual, and erect
    B. Diminished, and inverted
    C. Virtual and magnified
    D. Real and erect

Section 2 (Eight Questions)

Directions: *these groups of question deal with practical situations. Each situation is followed by a set of questions. Select the best answer for each question.*



43. The component X is called
    A. Ammeter C. rheostat
    B. Resistor D. voltmeter
44. What property of A permits it to be connected as shown
    A. It has a very high resistance
    B. It has a very low resistance
    C. It cannot be easily damaged
    D. It has a very low conductivity
45. The slope of the graph of the p.d across Y plotted against the current through it represents
    A. Conductivity C. Voltage
    B. Current D. resistance
46. If Y is a filament bulb, which of the following graphs shows how the p.d V varies with current I?

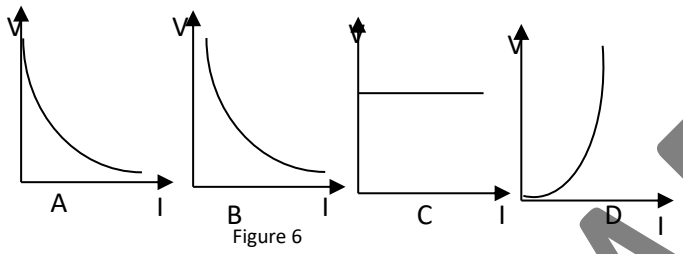


Figure 6

Question 47- 50

The waveform in figure 8 is produced by an instrument vibrating at a frequency of 50 Hz connected to a cathode ray oscilloscope

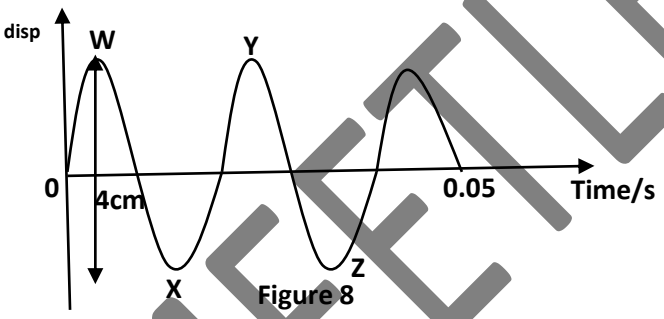


Figure 8

47. The amplitude of the wave is
    A. 4 cm C . 2cm
    B. 0.05 cm D. 8 cm
48. The period of oscillation of the wave is
    A. 50s B. 2.5 s C. 0.01 s D. 0.02s
49. If the wave is travelling at a speed of 100 ms^{-1}, the wavelength of the wave is
    A. 5000 m C. 2 m
    B. 150 m D. 0.5 m
50. Two points in phase on the waveform are
    A. W and X C. W and Z
    B. W and Y D. X and Y