UNEB U.C.E PHYSICS 2008

SECTION A: (40 MARKS)

Answer all questions

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

a. A ruler

b. A tape measure

c. Vernier calipers

d. A micrometer screw gauge

2. An isotope of a nuclide 35x17 has

a. 18 protons and 17 neutrons

b. 17 electrons and 18 neutrons

c. 17 protons and 20 neutrons

d. 18 protons and 18 neutrons

3. Which of the following is NOT an effect of an electric magnet?

a. Electrolysis

b. Magnetic effect

c. Heating effect

d. Radioactivity

4. The rate of evaporation of a liquid increases when

(i). temperature increases

(ii)Pressure increases

(i) Its surface area increases.

a. (i) and (ii)

b. (i) and (iii)

c. (ii) and (iii)

d. (i), (ii) and (iii)

5. The slope of a velocity -time graph is the

a. Speed of the body

b. Velocity of the body

c. Acceleration of the body

d. Distance travelled by the body

6. Which one of the following objects can be charged by friction?

a. Safety pin

b. Copper plate

c. Razor blade

d. Plastic ruler

7. Which of the following works with a direct current only?

a. Electroplating

b. Electric lamp

c. Transformer

d. Electric bell

8. A ray of light travelling from a dense to a denser medium is

a. Refracted towards the normal

b. Reflected away from the normal

c. Always reflected back to the same medium

d. Always transmitted without being reflected

9. A car accelerates from $4.0ms^{-1}$ to $20.0\ ms^{-1}$ in 8.0s. how far does it travel in this time?

a. 32m

b. 96m

c. 128m

d. 160m

10. Radiation in a thermos flask is minimized by

a. Cork

b. Vacuum

c. Felt pad

d. Silvered glass walls

11. A mass of 500 g produces an extension of 10 cm in a spring. Find the force that will produce an extension of 25cm.

a. 0.5N

b. 12.5N

c. 50.0N

d. 200.0N

12. Which of the following is a best conductor of heat?

a. Silver

b. Iron

c. Copper

d. Aluminium

13. Calculate the power wasted as heat in a cable of resistance 0.5# when transmits 2 k w at 100v.

a. 800w

b. 200w

c. 100w

d. 50w

14. The image formed in a plane mirror is

(i) The same distance behind as the object is in front

(ii) Totally inverted

(iii) Magnified and virtual

a. (i) and (ii) only

b. (i) and (iii) only

c. (ii) and (iii) only

d. (i), (ii) and (iii)

15. Hot water pipes are designed with bends in them in order to

a. Reduce the speed of water

b. Give the pipe more rigidity

c. Allow for pressure changes

d. Allow for expansion of the pipe

16. Which of the following equations represents a nuclei process in which an a-particular is emitted?

17. The possible energy transfer in an electric bulb is

a. Light energy to heat energy

b. Heat energy to electrical energy

c. Electrical energy to light energy

d. Light energy to electrical energy

18.

Figure 1 shows magnetic field lines between two magnetic poles. The poles marked P.Q.X and Y are respectively.

a. North, south, south and north

b. South, north, north and south

c. North, north, south and north

d. South, south, north and south

19. A body has a constant velocity when

(i) Acceleration is increasing

(ii) It is moving in a straight line

(iii) The net force on the body is zero

a. (iii) only

b. (i) and (ii) only

c. (i) and (iii) only

d. (ii) and (iii) only

20. Light travelling in air is incident on a medium at an angle of 60^0. Find the refractive index, if the angle of refraction is 30^0.

a. 0.50

b. 0.58

c. 1.73

d. 2.00

21. The recoil velocity of a gun will depend on :

(i) Mass of the shell

(ii) Muzzle velocity of shell

(iii) Muzzle diameter of the gun

(iv) Mass of the gun

a. (i) only

b. (iii) only

c. (ii) and (iii) only

d. (i), (ii) and (iv) only

22. A 5 kg mass falling steadily at $0.8m^{-1}$ is used to drive dynamo. If the dynamo's output power is 12 w, find the efficiency of the system.

a. 3.0%

b. 3.3%

c. 30.0%

d. 33.3%

23. The principle of conservation of energy states that

a. Energy is the ability to do work

b. Energy is composed of kinetic and potential energy

c. Energy will always be converted from one form to another

d. Energy cannot be created or destroyed but it can be changed from one form into another.

24. When oil of volume $6x10^{-3}$ 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. $4.77x10^4$ cm

b. $14.32x10^4$ cm

c. $1.91x10^3$ cm

d. $5.24x10^2$ cm

25. The X and Y-plates in a cathode ray oscilloscope make up the

a. Electron gun

b. Deflection system

c. Focusing system

d. Accelerating system

26.An 'echo sounder' in a boat emits a pulse of sound which returns 0.2 s later, after reflection from the sea-bed. If sound travels at 1500 ms^{-1} in sea water, how deep is the water?

a. 7,500 m

b. 600 m

c. 300 m

d. 150 m

27. Cathode rays are

a. Electromagnetic waves.

b. Stream of x-rays

c. Protons emitted by a hot cathode

d. Streams of electrons moving at high speed

28.Figure 2 shows two cells each of e.m.f 4.5 volts and internal resistance 0.5# , connected to a 2# resistor. What is the ammeter reading?

a. 1.5 A

b. 2.0 A

c. 4.0 A

d. 9.0 A

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

a. Diffusion

b. Evaporation

c. Brownian motion

d. Osmosis

30. A man takes one minute to lift 4 bags of sugar each of weight 50N through a height of 1.5 m. calculate the power expended

a. 1.25 W

b. 5.00 W

c. 75.00 W

d. 300.00 W

31. The wave length of a progressive transverse wave is defined as the

a. Height of a crest

b. Distance between a trough and a crest

c. Distance between successive crests

d. Distance between any two troughs

32. A current of 6A flows for 2 hours in a circuit. Calculate the quantity of electricity that flows in this time.

a. 3 C

b. 12 C

c. 720 C

d. 43200 C

33. The strength of material is its ability to resist

(i) Compression

(ii) Shearing forces

(iii) Change in size or shape

a. (i) only

b. (ii) only

c. (i) and (ii) only

d. (i), (ii) and (iii)

34.Two forces of 15 N act on a block placed on a smooth table as shown in figure 3. Find the resultant force on the block.

a. 20 N

b. 50 N

c. 525 N

d. 1000 N

35. A stationary wave is formed when two waves of

a. Equal amplitude and frequency travel along the same path in the same direction.

b. Equal amplitude and frequency travel perpendicularly to one another

c. Equal amplitude and frequency travel along the same path but in opposite directions.

d. Different frequencies travel along the same path but in opposite directions.

36. The rate at which electric charge flows past a point in a circuit is measured in

a. Watts

b. Volts

c. Amperes

d. Coulombs

37. The frequency of a vibrating string depends on

a. Pitch

b. Length

c. Medium

d. Amplitude

38. A car of mass 500 kg accelerates steadily from rest to 40 ms^{-1} in 10 s. calculate the force that produces this acceleration.

a. 20.000 N

b. 5,000 N

c. 2,000 N

d. 125 N

39. Which of the following gives the difference between a-particles and B-particles?

a. The charge of an a-particles is +2 while that of the B-particles is -1.

b. An a-particle is an electron while the B-particle is a helium atom

c. B-particles are more ionizing than a-particles

d. B-particles are heavier than a-particles

40. It is easier to use a claw hammer to remove a nail from a piece of woood if the handle is longer because

a. Effort applied becomes bigger

b. Turning effort becomes bigger

c. Anticlockwise moments will balance clockwise moments

d. Fulcrum is between the effort and the lord

SECTION B: (40 MARKS)

Answer all questions in this section. All working must be clearly shown in the spaces provided

41. (a) What is meant by boiling point of a liquid?

(b) why is cooking oil faster with a pressure cooker?

(c) state two differences between boiling and evaporation

42. Define work.

(b) a body is raised above the ground and then released above the ground and then released. State the subsequent energy changes that occured.

43. (a) state one factor which affects the magnitude of the force on current-carrying conductor in a magnetic field.

(b) Figure 4 shows a wire placed in a uniform magnetic field. If the force acting on the wire is into the paper.

(i) Indicate on the diagram the direction of the current through the wire.

(ii) Explain what happens when the battery terminals connected to wire AB are reversed.

43. (a) what is meant by radioactivity?

(b) The equation above shows a reaction which takes place in nuclear reactor

(i) Name the reaction shown by the equation

(ii) Find x and y

44. (a) Figure 5 shows a box of mass 2.0 kg on a smooth surface. If forces of 12N and 8N acts on it, find the acceleration.

(b) why does a stone released in space fall?

46. (a) state the laws of reflection

(b) Figure 6 shows two successive parallel wave fronts A and B incident on a straight barrier xy. Complete the diagram to show the reflected wave fronts

47. (a) what is a ductile material?

(b) give two examples of ductile materials

48. (a) Explain whether the eye is able to see the object clearly.

(b) What is meant by accommodation?

49. (a) The figure above shows part of the electromagnetic spectrum consisting of gam radio waves, infrared and visible light. Identify the bands to which these radiate.

(b) State one application of radiation in

(i) Band A

(ii) Band B

48. (a) What is meant by the atomic number of an element?

(b) one isotope of neon is denoted by $^{20}_{10}Ne$

How many neutrons does the isotope have?

(c) $^{60}_{70}$ co is radioactivity isotope of cobalt which emits a beta particle and very high energy gamma rays to from x.

Write a balanced equation for the nuclear equation.

49. state ohm's law

(b) Two resistors of resistances 3# and 6# are connected across a battery of 4v of negligible internal resistance as shown in figure 14 above. Find the

(i) Combined resistance

(ii) Current supplied by the battery

10. (a) what happens to an insulator when it is rubbed by another insulator of different material?

(b) Figure 7 shows a uniform rod of length 4.0 m improved from one end. If the weight of the rod is 120N, find the force F which keeps the rod horizontal.

50. Figure 8 shows a ray of light incident normally on a glass prism in air. The critical angle of the prism is 42^0.

(a) Complete the ray diagram to show the path of the light as it emerges from the prism

(b) Calculate the refractive index of the glass of the prism.