



RRB ALP Stage II General Science PDF

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1. 1 calorie equals to

- a. 1.2 joule
- b. 3.2 joule
- c. 4.2 joule
- d. 25 joule

Ans. c

Calorie is a unit of energy. The unit of energy in the International System of Units is the joule. One small calorie is approximately 4.2 joules

So

1 cal. = 4.2 joule

2 cal. = 8.4 joule

2. The transfer of heat in solid is called as

- a. Conduction
- b. Convection
- c. Radiation
- d. None of the above

Ans. a

In conduction the molecule of solid pass heat from one to another, without themselves moving from their position. Conduction is the transfer of heat energy by direct contact, convection is the movement of heat by actual motion of matter; radiation is the transfer of energy with the help of electromagnetic waves

3. The process by which heat is transferred without heating the space between the hot body and colder body is known as

- a. conduction
- b. radiation
- c. absorption
- d. none of these

Ans. b

Radiation is a method of heat transfer that does not rely upon any contact between the heat source and the heated object as is the case with conduction and convection. Heat can be transmitted through empty space by thermal radiation often called infrared radiation. This is a type electromagnetic radiation. A good example would be heating a tin can of water using a Bunsen burner. Initially the flame produces radiation which heats the tin can. The tin can then transfers heat to the water through

conduction. The hot water then rises to the top, in the convection process

4. The thermal conductivity values for water is

- a. 0.58
- b. 0.8
- c. 0.1
- d. 4.2

Ans. a

A measure of the ability of a material to transfer heat. Given two surfaces on either side of the material with a temperature difference between them, the thermal conductivity is the heat energy transferred per unit time and per unit surface area, divided by the temperature difference

The thermal conductivity of water is 0.58

5. Stainless steel pans are generally comes with copper base. The reason for this is

- a. Pans appear more colourful
- b. Copper is better conductor of heat than stainless steel
- c. Copper is more durable
- d. None of the above

Ans. b

Stainless steel pans lined with a copper core can deliver improved heat conductivity since copper has a reputation for providing greater control over temperature changes

This means that if you heat one end of a piece of copper, the other end will quickly reach the same temperature. Most metals are pretty good conductors; however, apart from silver, copper is the best.

6. Convert 2268 joules in calories?

- a. 270
- b. 1080
- c. 540
- d. 1620

Ans. c

1 calorie = 4.2 joule

Let's say X calorie = 2268 joules

So for finding X we have to divide 2268 joules by 4.2 because 1 joule = $\frac{1}{4.2}$ cal.
 $= \frac{2268}{4.2}$
 $= 540$ cal.



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7. What happen when 2000 calorie of heat is transferred to 200gm of water
- Rise in temperature is 10 degree
 - Rise in temperature is 100 degree
 - Decrease in temperature by 10 degree
 - None of the above

Ans. a

Mass of water 'M' = 200gm or 0.2kg

Heat supplied = 2000 cal. In joules

$(2000)(4.2)\text{joules}$

$=8400\text{ joules}$

Specific heat of water is $4200\text{j/kg}^\circ\text{C}$

Heat supplied $Q = (M)(S)(T)$

$8400 = (0.2)(4200)(T)$

$T = 100^\circ\text{C}$

Therefore the rise in temperature is 10 degree C

8. What is the thermal capacity of 1.5kg of water

- $6300\text{J}/^\circ\text{C}$
- $12600\text{J}/^\circ\text{C}$
- $3150\text{J}/^\circ\text{C}$
- None of the above

Ans. a

Specific heat of water $4200\text{J/kg}^\circ\text{C}$

Thermal capacity of 1.5kg of water =

$(1.5\text{kg})(4200\text{J/KG}^\circ\text{C})$

$=6300\text{J}/^\circ\text{C}$

9. You do a work of 250000 joules to cut a lawn with hand mover, if work done by lawnmower is 200000 joules then what is the efficiency of the lawnmower?

- 100%
- 95%
- 80%
- 50%

Ans. c

Efficiency = $(\text{work output} / \text{work input}) \times (100)$

Work input = 250000

Work output = 200000

$= (200000/250000) \times (100)$

$= 80\%$

10. Which is the example of second class lever

- Seesaw
- Pliers
- Nutcracker
- Pair of scissors

Ans. c

Lever in which load is sitting between fulcrum and effort is known as second class lever

Eg. Nut cracker

Wheel barrow

Bottle opener

11. What kind of simple machine does your front teeth resemble

- Inclined plane
- Wedge
- Wheel and axle
- Pulley

Ans. b

A wedge is a triangular shaped tool, and is a portable inclined plane, and one of the six classical simple machines. It can be used to separate two objects or portions of an object, lift up an object, or hold an object in place.

Your front teeth are incisors shaped like a wedge. Just like a wedge, incisors are thick at one end and thinner at the other

12. What is the mechanical advantage of a simple machine when a load of 450N can be lifted by force of 50N using a lever?

- 9
- 4
- 5
- 1

Ans. a

Mechanical advantage of a lever is

M.A of a lever = $\text{load}/\text{effort} = 450/50 = 9$

13. A boy of mass 30 kg sits at a distance of 80 cm from the fulcrum of a seesaw. Calculate the mass of the other boy who is sitting at a distance of 16 cm from the fulcrum?

- 100 kg
- 150 kg
- 200kg
- none of these

Ans. b

In fulcrum

$\text{Load} \times \text{Load arm} = \text{effort} \times \text{Effort arm}$

Let effort be X

$= (30) \times (80) = (X) \times (16)$

$= 16X = 2400$

$X = 2400/16$

$= 150\text{kg}$



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14. A lever has a load arm of 4m and effort arm is 8m calculate its mechanical advantage?

- a. 0.5
- b. 1
- c. 1.5
- d. 2

Ans. d

Mechanical advantage of lever is

$M.A = \text{effort arm/load arm}$

$= 8m/4m$

$= 2$

15. A class 1 lever with a length of 6m can lift a load of 60N with a force of 30 N find the position of the fulcrum?

- a. 25m
- b. 425m
- c. 12m
- d. 1m

Ans. D

Load = 60N

Effort = 30N

Let X be the distance of fulcrum from the load

Effort arm = (3-X)

As we know that

$(\text{Load})(\text{load arm}) = (\text{effort})(\text{effort arm})$

$(60N)(X) = (30N)(3-X)$

$60X = 90N - 30X$

$90X = 90N; X = 1m$

16. A single movable pulley is used to lift a load 800N. what effort is required

- a. 1600N
- b. 400N
- c. 200N
- d. 50N

Ans. b

As we know the mechanical advantage of single moved pulley is 2 so

$M.A \text{ of pulley} = \text{load/effort}$

Load is 800N

Let effort be X

$2 = 800N/X$

$X = 400N$

17. A crate of bananas weighing 3000 N is shipped from Ramgarh to Delhi, where it is unloaded by a dock worker who lifts the crate by puling with a force of 200 N on the rope of a pulley. What is the actual mechanical advantage of the system?

- a. 15N

- b. 20N

- c. 3N

- d. 1.5N

Ans. a

Mechanical advantage of a pulley = force output/force input

Force output is 3000N

Force input is 200 N

$M.A = 3000/200$

$= 15N$

18. A ramp of 12 m long and 4 m high has a mechanical advantage of _____

- a. 4
- b. 5
- c. 3
- d. 0

Ans. c

Mechanical advantage of a ramp = length of a ramp/ height of the ramp

$= 12m/4m$

$= 3m$

19. Rahul used his pulley to lift a piano with a force of 1450 N a distance of 4 m, pulley has a mechanical advantage of 10 how much force must the mover use

- a. 145N
- b. 725N
- c. 500N
- d. None of the above

Ans. a

Mechanical advantage = force output/force input

Force input is not given so let it be X

$M.A = 1450/X$

$10 = 1450/X; 10X = 1450$

$X = 145N$

20. To remove a nail from a piece of wood with a hammer a man uses 710Joule of work. The work output of the hammer is 355 Joule find the efficiency?

- a. 150%
- b. 200%
- c. 50%
- d. 100%

Ans. c

Efficiency of hammer = (work output/work input)(100)

$= (355/710)(100)$

$= 50\%$



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21. A mangonel catapult is best described as what type of lever

- a. Class 1 lever
- b. Class 2 lever
- c. Class 3 lever
- d. None of these

Ans. c.

A mangonel catapult works just like a third-class lever. The base of the catapult acts as the fulcrum which the catapult arm pivots on. In this case, the force is provided by tension in string. The load acts as the projectile in the bucket

A weapon used during the Middle Ages (Medieval period) in siege warfare. The Mangonel similar to a catapult which worked by using torsion or counterpoise. Mangonels fired heavy projectiles from a bowl-shaped bucket at the end of its arm.

22. A ramp with a mechanical advantage of 13 lifts objects to a height of 11 meters. How long is the ramp?

- a. 13/11m
- b. 143m
- c. 1.2m
- d. 100m

Ans. b

Mechanical advantage of a ramp = length of the ramp/height of the ramp

$$M.A = 13$$

$$\text{Height} = 11$$

$$\text{Length} = X$$

$$13 = X/11$$

$$X = 143 \text{ m}$$

23. A bottle opener is an example of

- a. Screw
- b. lever
- c. Pulley
- d. Ramp

Ans. b

In a second class lever, the fulcrum is on one end of the lever, the effort is on the other end, and the load is between the fulcrum and the effort. Examples of second class levers are bottle openers, nut crackers, the cutting arm on a paper cutter, and a wheelbarrow.

24. Troposphere is _____

- a. Portion of air

b. Lowest level of atmosphere where we survive

- c. 3rd layer of atmosphere
- d. A layer above ionosphere

Ans. b

Earth's atmosphere can be divided (called atmospheric stratification) into five main layers. Excluding the exosphere, the atmosphere has four primary layers, which are the troposphere, stratosphere, mesosphere, and thermosphere. From highest to lowest, the five main layers are:

Exosphere: 700 to 10,000 km (440 to 6,200 miles)

Thermosphere: 80 to 700 km (50 to 440 miles)

Mesosphere: 50 to 80 km (31 to 50 miles)

Stratosphere: 12 to 50 km (7 to 31 miles)

Troposphere: 0 to 12 km (0 to 7 miles)

The troposphere is the lowest major atmospheric layer, extending from the Earth's surface up to the bottom of the stratosphere. The troposphere is where all of Earth's weather occurs. It contains approximately 80% of the total mass of the atmosphere.

25. A renewable source of energy is

- a. Petrol
- b. Nuclear fuel
- c. CNG
- d. Trees

Ans. d

Trees are a renewable resource. They provide fruit, nuts, rubber and maple syrup without destruction of the tree. And if a tree is cut down for wood, pulp or green charcoal, it can be replanted. While trees are a renewable resource, forests are not.

A non-renewable resource is a resource that does not renew itself at a sufficient rate for sustainable economic extraction in meaningful human time-frames. An example is carbon-based, organically-derived fuel.

26. Atmospheric humidity is measured by

- a. Hygrometer
- b. Odometer



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- c. Photometer
d. None

Ans. a

Hygrometer, instrument used in meteorological science to measure the humidity, or amount of water vapour in the air. Several major types of hygrometers are used to measure humidity.

It uses a pair of thermometers standing side by side. One has a bulb open to the air; the other has a bulb covered in a wet cloth. ... You measure the humidity by comparing the readings from the two thermometers.

27. Which is necessary for photosynthesis

- a. Chloroform
b. Chlorophyll
c. Chlorofluoro carbon
d. None of these

Ans. b

Photosynthesis is the process used by plants, algae and certain bacteria to harness energy from sunlight and turn it into chemical energy

The role of chlorophyll in photosynthesis is vital. Chlorophyll, which resides in the chloroplasts of plants, is the green pigment that is necessary in order for plants to convert carbon dioxide and water, using sunlight, into oxygen and glucose

28. What is desertification?

- a. Conversion of forest into desert
b. Conversion of Grassland into desert
c. Conversion of cropland into desert
d. All of the above

Ans. d

Desertification occurs due to a decrease in vegetation. This can happen naturally due to a drought or can be caused by human activities. The lack of plants can cause changes to the land. Plants help shade the soil, so when plants are removed, the soil will be exposed to the sun and will dry out more quickly.

29. Which chemical is responsible for Bhopal gas tragedy

- a. Methyl iso cyanate
b. Benzene hexa chloride
c. Tri nitro toluene

- d. None of these

Ans. a

Bhopal gas tragedy it happened at a Union Carbide subsidiary pesticide plant in the city of Bhopal, India. On the night of 2-3 December 1984, the plant released approximately 40 tonnes of toxic methyl isocyanate (MIC) gas, exposing more than 500,000 people to toxic gases

Methyl isocyanate is an intermediate chemical in the production of carbamate pesticides (such as carbaryl, carbofuran, methomyl, and aldicarb). It has also been used in the production of rubbers and adhesives. As a highly toxic and irritating material, it is extremely hazardous to human health.

30. Corbett national park located at

- a. Uttarakhand
b. Rajasthan
c. Kerala
d. Madhya Pradesh

Ans. a

Corbett National Park is a forested wildlife sanctuary in northern India's Uttarakhand State. Rich in flora and fauna, it's known for its Bengal tigers.

Animals, including tigers, leopards and wild elephants, roam the Dhikala zone.

On the banks of the Ramganga Reservoir, the Sonanadi zone is home to elephants and leopards, along with hundreds of species of birds.

31. A car travels at a pace of 60km/h for 3 hours then at 125km/hr for 5 hrs and rest of the journey at 90 km/hr for 2 hrs. what was his average pace through out his journey?

- a. 112km/hr
b. 125km/hr
c. 98.5km/hr
d. None of these

Ans. c

To calculate avg speed = total distance/total time

$$= \frac{60 \times 3 + 125 \times 5 + 90 \times 2}{3 + 5 + 2}$$

$$= \frac{985}{10}$$

$$= 98.5 \text{ km/hr}$$

32. UNIVAC is

- a. Universal automatic computer
b. Unique automatic computer



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- c. Universal array computer
- d. None of these

Ans. a

Short for Universal Automatic Computer, The UNIVAC is an electrical computer containing thousands of vacuum tubes that utilizes punch cards and switches for inputting data and punch cards for outputting and storing data.

33. ALU

- a. Arithmetic logic unit
- b. Array logic unit
- c. Algorithmic logic unit
- d. None of these

Ans. a

An arithmetic logic unit (ALU) is a digital circuit used to perform arithmetic and logic operations. It represents the fundamental building block of the central processing unit (CPU) of a computer. Modern CPUs contain very powerful and complex ALUs.

34. The capacity of 3.5 inch floppy disc is

- a. 1.44 GB
- b. 1.40 MB
- c. 1.44 MB
- d. 1.40 GB

Ans. c

In the late 80's, the 5.25-inch floppy disk was on its way out and in 1987 the 3.5-inch floppy disk had moved into the high density category with a capacity of 1.44 MB.

35. Which of the following is the part of central processing unit?

- a. Printer
- b. Mouse
- c. Arithmetic and logic unit
- d. Keyboard

Ans. c

The central processing unit (CPU) of a computer is a piece of hardware that carries out the instructions of a computer program. It performs the basic arithmetical, logical, and input/output operations of a computer system

The two typical components of a CPU include the following:

The arithmetic logic unit (ALU), which performs arithmetic and logical operations.

The control unit (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.

36. Junk email is also called

- a. Spam
- b. Spoof
- c. Snipper script
- d. None of these

Ans. a

Email spam, also known as junk email, is unsolicited messages sent in bulk by email. Most email spam messages are commercial in nature. Whether commercial or not, many contain disguised links that appear to be for familiar websites but in fact lead to phishing web sites or sites that are hosting malware

37. First page of website is termed as

- A. Home page
- B. Java script
- C. Index page
- D. Bookmark

Ans. a

A home page is generally the main page a visitor navigating to a website from a web search engine will see, and it may also serve as a landing page to attract visitors.

38. Which device is required for the internet connection

- a. Printer
- b. Keyboard
- c. Modem
- d. Nic card

Ans. c

A modem is a device or program that enables a computer to transmit data over, for example, telephone or cable lines. Computer information is stored digitally, whereas information transmitted over telephone lines is transmitted in the form of analog waves. A modem converts between these two forms.

39. Which of the following is first generation computer?

- a. EDVAC
- b. IBM1401
- c. CDC 1604
- d. ICL2900



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Ans. a

The first computer systems used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms.

the first generation computers include ENIAC, EDVAC, UNIVAC, IBM-701, and IBM-650. These computers were large and very unreliable. They would heat up and frequently shut down and could only be used for very basic computations.

40. DOS stands for

- a. Digital open system
- b. Disk operating system
- c. Digital opening system
- d. Disk operating session

Ans. b

The term DOS can refer to any operating system, but it is most often used as a shorthand for MS-DOS (Microsoft disk operating system). Originally developed by Microsoft for IBM, MS-DOS was the standard operating system for IBM-compatible personal computers

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41. Which part is known as the brain of the computer?

- a. Central processing unit
- b. Monitor
- c. Arithmetic and language unit
- d. Control centre

Ans. a

The computer brain is a microprocessor called the central processing unit(CPU). The CPU is a chip containing millions of tiny transistors. It's the CPU's job to perform the calculations necessary to make the computer work -- the transistors in the CPU manipulate the data. You can think of a CPU as the decision maker

42. A Honda takes ten minutes to go from milepost 71 to milepost 81. A Toyota takes fifteen

minutes to go from milepost 65 to milepost 80. Which car has the higher average speed.

- a. Toyota
- b. Honda
- c. Same average speed
- d. None of these

Ans. c

Average speed = total distance/total time

For car A

Total distance travel=10 mile

Total time taken to cover the distance is 10 min

Avg. speed= $10/10$
=1mile/minute

For car B

Average speed= total distance/total time

Total distance travel=15 miles

Total time taken= 15 min

Avg. speed = $15/15$
=1mile/minute

43. A car initially traveling north at 5 m/s has a constant acceleration of 2 m/s² northward. How far does the car travel in the first 10 s?

- a. 20m
- b. 50m
- c. 100m
- d. 150m

Ans. d

Equation of motion

$S = ut + \frac{1}{2}at^2$

S= distance

U = initial velocity

A = acceleration

T= time

Putting the value

$S = 5 \times 10 + \frac{1}{2}(2)(10)^2$
=50+100
=150m

44. You decide to launch a ball vertically so that a friend located 45 m above you can catch it. What is the minimum launch speed you can use?

- a. 30M/S
- b. 45M/S
- c. 15M/S
- d. 90M/S

Ans. a

From the equation of motion

$V^2 = u^2 + 2as$



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$A = G = 9.8$ or 10 acting downward so acceleration is negative

$$V^2 = 0 - 2(10)(45)$$

$$= -900$$

$$V^2 = 900$$

$$V = 30$$

45. A dirt bike starts up a steep hill with a speed of 5 m/s . Since it is underpowered it slows down at the rate of 0.2 m/s as it climbs the hill. It clears the crest of the hill after 15 seconds. How far did the dirt bike travel up the hill?

- a. 97.5m
- b. 75m
- c. 52.5
- d. 15m

Ans. c

From equation of motion

$S = ut - \frac{1}{2}at^2$ (here $a = -a$ because its acting as a deceleration)

$$= 5 \times 15 - \frac{1}{2}(0.2)(15)^2$$

$$= 75 - 22.5$$

$$= 52.5$$

46. A train S, 120 m long runs with a velocity 72 kmh ; while train T 130 m long is running in opposite direction with a velocity 108 kmh . The time taken by T to cross train S is

- a. 10
- b. 25
- c. 50
- d. 5

Ans. d

Velocity of S - train $= 72 \text{ kmh} = 20 \text{ m/s}$

Velocity of T - train $= 108 \text{ kmh} = 30 \text{ m/s}$

Relative vel. of T w.r.t. S

$$= 30 + 20 = 50 \text{ m/s}$$

Distance = train 1 + train 2 = 250 m

Time = distance/time

$$= 250/50$$

$$= 5 \text{ sec}$$

47. A man swims in still water of a river of width D with speed v . The river flows with velocity $(v/2)$. He swims making an angle Q with the upstream to cross the river in shortest distance. The time taken to cross the river is

- a. D/V
- b. $D/V \cos Q$
- c. $D/V \sin Q$
- d. None of these

Ans. c

$V_m = \text{vel. of man} = v$

$V_r = \text{vel of river} = V/2$

$$V/2 = V \sin Q ; \sin Q = 1/2$$

$$Q = 30^\circ$$

$$\text{Time } t = d/v$$

$$= d/v \sin Q$$

$$= 2D/v$$

48. Rajesh is trying to reach the exactly opposite point on the bank of a stream is swimming with a speed of 0.5 m/s at an angle of 120° with the direction of flow of the stream. The speed of the stream is

- a. 11 m/s
- b. 2.5 m/s
- c. 0.25 m/s
- d. 0.400 m/s

Ans. c

$v = \text{velocity of stream.}$

Resultant of u and v must be R

$$u = 0.5 \text{ m/s}$$

$R = \text{resultant velocity}$

$$v = u \sin 30^\circ$$

$$= 0.5 \times 1/2 = 0.25 \text{ m/s}$$

49. A boat crosses the river in short possible route. The speed of the boat in still water is 13 m/s . The average speed of the boat while crossing the river comes out to be 12 ms . The velocity of the river

- a. 5 m/s
- b. 15 m/s
- c. 3 m/s
- d. 2 m/s

Ans. a

$V_b = \text{velocity of boat} = 13 \text{ m/s}$

$V_r = \text{average speed} = 12 \text{ m/s}$

$V_r = \text{velocity of river}$

$$= \sqrt{(13)^2 - (12)^2}$$

$$= 5 \text{ m/s}$$

V of river is 5 m/s

50. A clock has its minute hand of 4 cm long. find the avg. velocity of the tip of the minute hand between 6am to 6:30am

- a. $4.4 \times 10^{-3} \text{ m/s}$
- b. $4.4 \times 10^{-3} \text{ cm/s}$
- c. $2.4 \times 10^{-3} \text{ km/s}$
- d. None of these

Ans. b



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At 6 am the tip of the minute hand is at 12 mark and at 6:30am at it is 1800 away thus the straight line distance between initial and final positions of the tip is equal to the diameter of the clock
So $r = 4\text{cm}$

$D = 8\text{cm}$

Time = 30min = 1800 sec

Avg speed = distance travelled / time
= $8/1800$
= 4.4×10^{-3}

51. A ball is thrown from a field with a speed of 12m/s at an angle of $Q = 45^\circ$ with the ground at what distance will it hit the ground again? $G = 10\text{m/s}^2$

- a. 16.8m
- b. 14.4m
- c. 24m
- d. 5m

Ans. b

The horizontal range = $u^2 \sin 2Q / g$
= $(12 \times 12 \times \sin(2 \times 45)) / g$
= $(144 \text{m}^2/\text{s}^2) / 10$
= 14.4 m

Thus the ball hit the ground at 14.4m from the point of projection.

52. A man moves on a semi-circular track of radius 35m during a morning walk if he starts one end of the track and reaches other in 10second find the avg. speed

- a. 25m/s
- b. 10m/s
- c. 5m/s
- d. None of these

Ans. b

Distance = πr
= $(22/7) \times 35$
= 110m

Avg speed = distance/time
= $110/10$
= 10m/s

53. A rock climber climbs 63m to the top of a cliff. If the rock climber has a mass of 85kg what is the potential energy of the climber?

- a. 5240 joules
- b. 52479 joules
- c. 5249 joules
- d. 5247 joules

Ans. b

Potential energy = $M \times G \times H$

M = mass

G = gravity

H = height

= $85 \times 9.8 \text{m/s}^2 \times 63$

= 52479 joules

54. What is the kinetic energy of a 55 kg man running at a pace of 2m/s ?

- a. 110 joule
- b. 220 joule
- c. 450 joule
- d. None of these

Ans. a

Kinetic energy = $1/2 mv^2$

M is mass

V is velocity

= $(1/2) \times 55 \text{kg} \times 2 \times 2$

= 110 joule

55. The total amount of energy delivered every second to a resistor is a measure of?

- a. Volts
- b. Power
- c. Current
- d. Resistance

Ans. b

The power rule ($P = I \times V$), we need to know both the current through the resistor, and the voltage across the resistor. First, we use Ohm's law ($V = I \times R$), to find the current through the resistor.

56. The build up of electrical charges on an object is called _____

- a. Static electricity
- b. Electric electricity
- c. Current electricity
- d. None of these

Ans. a

Static electricity is an imbalance of electric charges within or on the surface of a material. The charge remains until it is able to move away by means of an electric current

The build up of electrical charges on an object is called static electricity. ... This type of electricity is caused by the transfer of electrons between objects.

57. Electric current is measured in

- a. Amperes
- b. Ohm
- c. Celsius
- d. Joule



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Ans. a

The SI unit for measuring an electric current is the ampere, which is the flow of electric charge across a surface at the rate of one coulomb per second. Electric current is measured using a device called an ammeter.

58. Which of the following is the source of direct current

- a. Battery
- b. Bar magnet
- c. Alcohol
- d. None of these

Ans. a

A battery converts chemical energy into electrical energy by a chemical reaction. Usually the chemicals are kept inside the battery. It is used in a circuit to power other components. A battery produces direct current (DC) electricity (electricity that flows in one direction, and does not switch back and forth).

59. When one bulb goes other remains lit in a

- a. Series circuit
- b. Parallel circuit
- c. Closed circuit
- d. Open circuit

Ans. b

The parallel circuit is the standard electrical circuit found in most homes and devices. Because it provides more than one way for a current to flow through to a device, it creates a much more stable and efficient power system than would otherwise be possible. The uses of the parallel circuit are manifold. A parallel circuit has two or more paths for current to flow through. Voltage is the same across each component of the parallel circuit. The sum of the currents through each path is equal to the total current that flows from the source.

60. In which directions do electrons flow

- A. From positive to negative
- B. From negative to positive
- C. From positive to positive
- D. None of these

Ans. b

Electrons are negatively charged, and so are attracted to the positive end of a battery and repelled by the negative

end. So when the battery is hooked up to something that lets the electrons flow through it, they flow from negative to positive

61. Plastic is an _____ of electricity

- a. Good conductor
- b. Insulator
- c. Bad conductor
- d. None of these

Ans. b

A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators.

Some common insulator materials are glass, plastic, rubber, air, and wood. Insulators are used to protect us from the dangerous effects of electricity flowing through conductors. Sometimes the voltage in an electrical circuit can be quite high and dangerous.

62. Ohm's law states that voltage divided by _____ is equal to resistance

- a. Current
- b. Resistor
- c. Cannibal's
- d. None of these

Ans. a

The potential difference (voltage) across an ideal conductor is proportional to the current through it. The constant of proportionality is called the "resistance", R. Ohm's Law is given by: $V = I R$ where V is the potential difference between two points which include a resistance R.

63. Which wire can be used as a resistor _____

- a. Nichrome wire
- b. Chromium wire
- c. Carbon coated wire
- d. None of these

Ans. a

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active



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elements, and terminate transmission lines, among other uses.

Resistors can be constructed out of a variety of materials. Most common, modern resistors are made out of either a carbon, metal, or metal-oxide film. In these resistors, a thin film of conductive (though still resistive) material is wrapped in a helix around and covered by an insulating material.

64. The energy of electrically charged particles moves from one place to another is

- a. Chemical energy
- b. Electrical energy
- c. Mechanical energy
- d. Thermal energy

Ans. b

Electrical energy can be used to move charged particles through a wire from a power plant to our homes and businesses.

The movement of a charged particle through a wire is called current, or more commonly, electricity. Electricity is used to work various appliances in our homes

65. The energy stored in chemical bonds between atom is

- a. Chemical energy
- b. Electrical energy
- c. Mechanical energy
- d. Nuclear energy

Ans. a

Chemical Energy: Energy stored in the bonds between atoms in molecules. For example, a leaf uses sunlight to bind carbon dioxide and water molecules into a sugar molecule. It stores the solar energy in the chemical bonds of that sugar molecule

66. Work done by a resultant force on a body is equal to

- a. Kinetic energy
- b. Potential energy
- c. Radiation
- d. Nuclear energy

Ans. a

The principle of work and kinetic energy (also known as the work-energy theorem) states that the work done by the sum of all forces acting on a particle

equals the change in the kinetic energy of the particle.

67. A cube has a side of $L = 1.2 \times 10^{-2}$ its volume is

- a. 1.7×10^{-6}
- b. 1.4×10^{-6}
- c. 2.7×10^{-6}
- d. 1.7×10^{-3}

Ans. a

$$L = 1.2 \times 10^{-2}$$

Volume of a cube is $= l^3$

$$= (1.2 \times 10^{-2})^3$$

$$1.7 \times 10^{-6}$$

68. The S.I unit of work is

- a. Newton
- b. Joule
- c. Meter
- d. Kg

Ans. b

Work is defined as a force causing the movement—or displacement—of an object. In the case of a constant force, work is the scalar product of the force acting on an object and the displacement caused by that force. The SI unit of work is the joule (J)

69. Burning of wood is an example of conversion of

- a. Chemical energy into heat energy
- b. Mechanical energy to heat energy
- c. Heat energy to light energy
- d. Light energy to heat energy

Ans. a

Dry wood stores chemical energy. This chemical energy is released as the wood burns, and it is converted into heat, which is also called thermal energy, and light energy. As a result of burning, the wood turns into an entirely new substance

70. Splitting of heavy unstable nuclear atom of uranium releases

- a. Nuclear energy
- b. Kinetic energy
- c. Chemical energy
- d. Electrical energy

Ans. a

The splitting of a uranium atom releases energy. This process is called "nuclear fission", since the centre of an atom is called its nucleus. When a uranium atom splits it gives off more neutrons, which



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can then split more atoms, and so the energy level rapidly multiplies. Nuclear fission is the process of splitting apart nuclei (usually large nuclei). When large nuclei, such as uranium-235, fissions, energy is released. So much energy is released that there is a measurable decrease in mass, from the mass-energy equivalence. This means that some of the mass is converted to energy

71. Water cycle is caused due to

- a. Chemical energy
- b. Solar energy
- c. Potential energy
- d. Kinetic energy

Ans. b

The sun is what makes the water cycle work. The sun provides what almost everything on Earth needs to go—energy, or heat. Heat causes liquid and frozen water to evaporate into water vapor gas, which rises high in the sky to form clouds...clouds that move over the globe and drop rain and snow

72. Strong current of water moves the blades of turbine because water has

- a. Kinetic energy
- b. Potential energy
- c. Kinetic and potential energy
- d. None of these

Ans. c

The water in a reservoir behind a hydropower dam is another example of potential energy. The stored energy in the reservoir is converted into kinetic energy (motion) as the water flows down a large pipe called a penstock and spins a turbine.

73. Two boy pushes a table in opposite direction with equal force then

- a. No work is to be done
- b. Double work is to be done
- c. Work is to be done
- d. None of these

Ans. a

Equal forces acting in opposite directions are called balanced forces. Balanced forces acting on an object will not change the object's motion. When you add equal forces in opposite direction, the net force is zero.

74. In a microphone sound energy is converted into

- a. Mechanical energy
- b. Chemical energy
- c. Electrical energy
- d. Kinetic energy

Ans. c

Microphones are a type of transducer - a device which converts energy from one form to another. Microphones convert acoustical energy (soundwaves) into electrical energy (the audio signal) Different types of microphone have different ways of converting energy but they all share one thing in common: The diaphragm

75. Two bodies have velocity in 1:2 ratio both have same weight. The ratio of their kinetic energy is

- a. 1:4
- b. 1:2
- c. 3:8
- d. None of these

Ans. a

Kinetic energy =

$$\frac{1}{2}mv^2$$

Body a : body b

$$\frac{1}{2}mv^2 : \frac{1}{2}mv^2$$

Velocity ratio

$$1:2$$

By putting velocity and mass in the equation

Both have same mass so let mass = 1

$$= \frac{1}{2} \times 1 \times 1^2 = \frac{1}{2} \times 1 \times 2^2$$

$$= 1:2$$

$$= 1:4$$

76. With respect to bank what is the work done by a man rowing a boat upstream?

- a. 0
- b. 100
- c. More than 1
- d. None of these

Ans. a

Work done= force* displacement

When the man rowing the boat upstream, he is at rest with respect to the bank. So , the displacement of the boat is zero . hence no work is done by the man

77. Mulching helps in

- a. Soil sterility



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- b. Soil fertility
- c. Moisture control
- d. All of the above

Ans. c

Mulching. Mulch is a material placed on the soil surface to maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions. Mulching (installing mulches) can help to improve crop yield and optimise water use.

78. Smog is a mixture of

- a. Smoke and fog
- b. Snow and fog
- c. Smoke and dust
- d. None of these

Ans. a

Smog is a kind of air pollution, originally named for the mixture of smoke and fog in the air. Classic smog results from large amounts of coal burning in an area and is caused by a mixture of smoke and sulphur dioxide. In the 1950s a new type of smog, known as Photochemical Smog

79. We use beam balance to measure

- a. Weight
- b. Mass
- c. Force
- d. Length

Ans. a

The beam balance measures the force exerted by the mass on the beam balance. The beam balance does not directly measure the mass. It uses the fact that the gravitational force on the object is proportional to its mass.

80. To determine the density of a solid we have to determine the

- a. Mass and area
- b. Mass and volume
- c. Weight and area
- d. Weight and volume

Ans. b

The molecules of different liquids have different size and mass. The mass and size of the molecules in a liquid and how closely they are packed together determine the density of the liquid. Just like a solid, the density of a liquid equals the mass of the liquid divided by its volume; $D = m/v$.

81. When a substance is heated its density

- a. Decrease
- b. Increases
- c. Remains same
- d. None of these

Ans. a

If an iron rod is heated, it will get longer and fatter and its density will decrease. This happens because the mass of the rod stays the same, but its volume increases. The increase in the volume of matter with increasing temperature is called expansion.

82. A jeweller uses

- a. Physical balance
- b. weight balance
- c. Both a and b
- d. None of these

Ans. a

A jeweller uses physical balance because he needs an accurate measurement of small items like gold, gems etc.

therefore he uses physical balance

Physical balance is used to measure the mass of a body. let us now understand the parts of a physical balance a physical. Balance or a laboratory balance consists of a central beam made of brass or aluminum at. ... line which is used to set the balance in the horizontal plane is suspended from the beam support a pointer.

83. A piece of wood of mass 160 g and volume of 200cm³ find the density of wood in cgs system?

- a. 0.8g/cm³
- b. 1.2g/cm³
- c. 1
- d. None of these

Ans. a

Mass of wood =160gm

Volume of wood=200cm³

Density of wood in cgs system

$D = m/v$

$= 160/200$

$= 0.8g/cm^3$

84. A block of metal has dimension 4cm,5cm and 25 cm and has a mass of 1.28kg find the density of the block?

- a. 2560kg/m³
- b. 1280 kg/m³



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- c. 540 kg/m³
d. None of these

Ans. a

Mass of metal 1.28kg

Volume of metal = $4 \times 5 \times 25 \text{ cm}$

= 500 cm³

= 0.0005 m³

= $d = m/v$

= $1.28 \text{ kg} / 0.0005 \text{ m}^3$

= 2560 kg/m³

85. The SI unit of mass is

- a. Gram
b. Kilogram
c. Meter
d. Milligram

Ans. b

The kilogram is the SI base unit of mass

The kilogram is the SI base unit of mass

and is equal to the mass of the

international prototype of the kilogram,

a platinum-iridium standard that is kept

at the International Bureau of Weights

and Measures (BIPM)

86. Density of body is represented by

- a. $D = m/v$
b. $D = m \times v$
c. $D = v \times \text{pressure}$
d. None of these

Ans. a

Density is a characteristic property of a substance. The density of a substance is the relationship between the mass of the substance and how much space it takes up (volume)

Density is a characteristic property of a substance. The density of a substance is the relationship between the mass of the substance and how much space it takes up (volume)

87. What is the unit of length

- a. Metre
b. Kilometre
c. Millimetre
d. None of these

Ans. a

Metre is the unit for length

The SI system, also called the metric system, is used around the world. There are seven basic units in the SI system: the meter (m), the kilogram (kg), the second (s), the kelvin (K), the ampere

(A), the mole (mol), and the candela (cd)

88. The quantity which has magnitude is called

- a. Scalar quantity
b. Vector quantity
c. Chemical quantity
d. None of these

Ans. a

A quantity which has only magnitude and no direction is called scalar quantity.

Example: mass

A scalar quantity is a one dimensional measurement of a quantity, like temperature, or mass. A vector has more than one number associated with it. A simple example is velocity. It has a magnitude, called speed, as well as a direction, like North or Southwest or 10 degrees west of North

89. A polar vector is which

- a. Gives the position of an object
b. Represents rotational effect
c. Has a starting point of an application
d. None of these

Ans. c

The vector which has a starting point or a point of application is called a polar vector. Velocity maybe regarded as a polar vector

a polar vector is a vector such as the radius vector that reverses sign when the coordinate axes are reversed. Polar vectors are the type of vector usually simply known as "vectors".

90. Which of the following acts in accordance with right hand screw rule?

- a) Polar vector
b) Axial vector
c) Displacement vector
d) Position vector

Ans. b

The vectors which represent rotational effect and act along the axis of rotation in accordance with right hand screw rule are called axial vector. Axial vector will have its direction along its axis of rotation depending on its anticlockwise or clockwise rotational effect.

91. What is the magnitude of a unit vector?

- a) It has no magnitude



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- b) Zero
- c) Constant but not zero
- d) Unity

Ans. d

The magnitude of a unit vector is unity. It just gives the direction of a vector. A unit vector has no units or dimensions.

92. Which have the following has zero magnitude?

- a) Fixed vector
- b) Zero vector
- c) Modulus of a vector
- d) Unit vector

Ans. b

A zero or null vector is a vector that has zero magnitude and an arbitrary direction. The velocity vector of a stationary object is a zero vector.

93. Walking off a man is an example of

- a) Resolution of forces
- b) Addition of vectors
- c) Subtraction of vectors
- d) Multiplication of vectors

Ans. a

While walking, a person presses the ground with his feet slightly slanted in the backward direction. The ground exerts upon him an equal and opposite reaction. Its horizontal component enables the person to move forward while the vertical component balances this weight.

94. Which of the following is used to find the depth of the sea-bed?

- a) Laser method
- b) Sonar method
- c) Radar method
- d) Reflection or echo method

Ans. b

The word sonar stands for sound navigation and ranging. On a sonar ultrasonic waves are transmitted through the ocean. They are reflected by the submerged rocks and received by the receiver. By measuring the time delay of the receipt, the distance can be determined.

95. Assuming the earth to be a sphere of uniform mass density, how much would a body weigh half way down to the centre of the earth if it weighed 250N on the surface?

- a) 125N
- b) 250N
- c) 0N
- d) 125N

Ans. a

Here $mg = 250N$,

$d = R/2$

Acceleration due to gravity at depth $d = R/2$,

below the earth's surface will be

$g_d = g(1 - d/R)$

$= g(1 - (R/2)/R)$

$= g/2$

Therefore, new weight $= mg_d$

$= mg/2$

$= 250/2 = 125N$.

96. If the kinetic energy of the satellite revolving in an orbit close to the earth's surface happens to be doubled, what happens to the satellite?

- a) It revolves faster
- b) It revolves slower
- c) It remains unaltered
- d) It escapes

Ans. d

When the kinetic energy of the satellite is doubled, its orbital velocity increases $\sqrt{2}$ times and becomes equal to the escape velocity. So the satellite will escape

97. A cyclist moves along a circular path of radius 70m. If he completes one round in 11s, calculate the total length of a path.

- a) 40m
- b) 440m
- c) 0m
- d) 11m

Ans. b

Radius of the circular path, $r = 70m$

Time takes to complete one round, $t = 11s$

Total length of the path, $s = 2\pi r =$

$2 \times 22/7 \times 70 = 440m$.

98. An object thrown from an aeroplane is an example for

- a) Projectile motion
- b) Resolution of forces
- c) Composition of vectors
- d) Addition of vectors

Ans. a



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A projectile is a name given to anybody which once thrown into space with some initial velocity, moves thereafter under the influence of gravity alone without being propelled by an engine or fuel. The path followed by a projectile is called its trajectory.

99. A ball is dropped downward from the roof of a building and simultaneously another ball is thrown in a horizontal direction, when will the balls reach the ground?

- Same time and same place
- The first ball will reach later than the second ball
- The second ball will reach later than the second ball
- Same time but different places

Ans. d

Both the balls will reach the ground at the same time but at different places. The vertical motion is not affected by the horizontal motion. This is called the principle of physical independence

100. Flying a bird is an example of

- Collinear vector
- Multiplication of vector
- Addition of vector
- Composition of vector

Ans. d

When a bird flies, it pushes the air with force in the downward direction with its wings. In accordance with Newton's law of motion, the air exerts equal and opposite reaction. According to the parallelogram law, the resultant of the reaction acts on the birds in the upward direction and helps the bird to fly upwards.

101. What is the representation factor of reducing scale?

- 1:3
- 3:4
- 4:5
- None of these

Ans. a

The representative fraction 1:3 indicates that the dimension of the drawing is one-third of the actual object. Since the drawing is smaller than the actual object, this type of scale is called reducing scale

102. In which position second quadrant is

- Below horizontal plane, behind vertical plane
- Above horizontal plane, above vertical plane
- Above horizontal plane, behind vertical plane
- None of these

Ans. c

The position of reference planes will be similar to quadrants in x, y plane co-ordinate system. As the 2nd quadrant lies above the x-axis and behind the y-axis here also the 2nd quadrant is above Horizontal plane, behind Vertical plane

103. The solid formed by 12 equal and regular pentagons as faces is called

- plantonic solid
- dodecahedron
- Icosahedron
- Pyritohedron

Ans. b

Plantonic solid is a regular convex polyhedron. Dodecahedron is one of the plantonic solid. Icosahedron is a solid which has twenty equal sized equilateral triangles as faces. Pyritohedron is the irregular dodecahedron

104. Safe work practice involves

- Using the prescribed Personal Protective Equipment
- Using safe manual-handling techniques
- Using knives and equipment safely
- All of the above

Ans. d

Safe work practice to prevent injuries and accidents are

- Using the prescribed Personal Protective Equipment
- Using safe manual-handling techniques
- Using knives and equipment safely
- Handling hot surfaces safely
- Safe handling of chemicals
- Clearing hazards from your work area

Paying attention to safety signs

105. What are the duties of the supervisor



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- a. Tell workers about hazards and dangers in the workplace and show them how to work safely.
- b. Make sure workers follow the law and the workplace health and safety policies and procedures.
- c. Make sure workers wear and use the right protective equipment.
- d. All of the above

Ans. d

Here are some of the things the OSHA (organisational health and safety association) says every supervisor has to do as part of their job:

- 1. Tell workers about hazards and dangers in the workplace and show them how to work safely.
- 2. Make sure workers follow the law and the workplace health and safety policies and procedures.

- 3. Make sure workers wear and use the right protective equipment.

Do everything reasonable to keep workers from getting hurt or sick on the job

106. How long will it take a 300 watt motor to complete a job that requires 1200 Joules of work?

- a. 4 seconds
- b. 3600 seconds
- c. 36 seconds
- d. 3600 joules

Ans. a

$$\text{Power} = \frac{\text{energy}}{\text{time}}$$

Energy = 1200 joules

Time = not given, so let it be X

Power = 300 W

So by putting them we get $x = 4$

Time is 4 sec



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