Jharkhand PECE 2021 Question Paper

Physics

1. Which is the ultimate source of energy?
- Water
- Sun
- Uranium
- Fossil fuels

2. The radius of curvature of a spherical mirror is 20 cm. What is its focal length?
- 20 cm
- 10 cm
- 5 cm
- 40 cm

3. You are given kerosene, turpentine, and water. In which of those does the light travel faster? (Given: refractive indices of kerosene, turpentine, and water are 1.44, 1.47, 1.33 respectively)
- Water
- Kerosene
- Turpentine
- It does not travel, it reflects the same media

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4. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convex lens, if the image is equal to the size of the object?
- +0.5 m
- -0.5 m
- +0.25 m
- -0.25 m

5. Which one of the following materials cannot be used to make a lens?
- Water
- Glass
- Clay
- Plastic

6. A cylindrical conductor of length l and uniform area of cross-section A has resistance R. Another conductor of length 2l and resistance R of the same material has an area of cross-section?

- A/2
- 3A/2
- 3A
- 2A

7. An electric bulb is connected to a 220V generator. The current is 0.5 A. What is the power of the bulb?

- 440 W
- 110 W
- 55 W
- 220 W

8. Which of the following is used by a dentist to examine a small cavity?

- Convex mirror
- Plane mirror
- Concave mirror
- Concave-convex lens

9. The SI unit of resistivity is

- Ohm meter
- Per ohm per meter
- Ohm per meter
- Ohm meter per second

10. The potential difference between the terminals of an electric heater is 60 V when it draws a current of 4 A from the source. What current will the heater draw if the potential difference is increased to 120V?

- 10 A
- 8 A
- 6 A
- 4 A

11. A student wants to extract energy from fossil fuels. Which processes would help him to extract energy from fossil fuels?

- Burning
- Crystallization
- Condensation

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- Distillation

12. Where should an object be placed in front of a convex lens to get a real image of the size of the object?
- At principal focus of the lens
- At twice the focal length
- At infinity
- Between the principal focus and the optical center

13. When a straight conductor is carrying current then,
- There are circular magnetic field lines around it
- There are magnetic field lines parallel to the conductor
- There are no magnetic field lines
- None of the above

14. Why is biogas considered as a good source of energy?
- As it produces ashes
- As it produces methane
- As it burns without releasing smoke
- As it decomposes in the absence of oxygen

15. Rihan can use any source of energy for cooking, but he wants to avoid the production of smoke from the source. Which of the following sources should he use for cooking?
- Coal
- Wood
- Petroleum
- Electricity

16. Which of the following processes explains the extraction of the sun's energy to generate energy to light a bulb?
- Conversion of electric energy into solar energy
- Conversion of solar energy into electrical energy
- Conversion of solar energy into kinetic energy
- Conversion of kinetic energy into solar energy

17. A rectangular coil of copper wires is rotated in a magnetic field. The direction of the induced current changes once in each
- Two revolutions
- One revolution

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- One-fourth revolution
- Hal revolution

18. An object placed at a distance of 0.25 m in front of a plane mirror. The distance between the object and the image will be
- 0.25 m
- 1.0 m
- 0.125 m
- 0.5 m

19. The nature of the image formed by a convex mirror when the object's distance from the mirror is less than the distance between the pole and focal point of the mirror would be
- Real, inverted, and diminished in size
- Real, inverted, and enlarged in size
- Virtual, upright, and diminished in size
- Virtual, upright, and enlarged in size

20. AC generator works on the principle of
- Force experienced by a conductor in a magnetic field
- Electromagnetic induction
- Electrostatic
- Force experienced by a charged particle

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Chemistry

1. Baking powder is a mixture of baking soda and a mild edible acid such as
- Gluconic acid
- Maleic acid
- Tartaric acid
- Fatty acid

2. Some metals can be beaten into thin sheets. This property is called
- Metallic lustre
- Ductility
- Sonorous
- Malleability

3. Lead and —---------- are comparatively poor conductors of heat
- Silver

- Mercury
- Copper
- Zinc

4. Bases which are soluble in water are called
- Pyridine
- Acids
- Salts
- Alkalis

5. Metalloid among the following
- Lithium
- Sodium
- Calcium
- Tellurium

6. Generally paper impregnated with —---------- is used for measuring pH.
- Acid-base indicator
- Redox indicator
- External indicator
- Universal indicator

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7. White silver chloride turns grey in sunlight. This is due to the —---------- of silver chloride.
- Oxidation
- Displacement
- Reduction
- Decomposition

8. Ethanoic acid reacts with absolute ethanol in the presence of an —---------- catalyst to give an ester
- Acid
- Base
- Nikel
- Palladium

9. The modern periodic table is based on
- Atomic weight
- Atomic number
- Atomic size

- Chemical nature

10. —---------- is the process of heating the ores strongly in limited air.
- Reduction
- Oxidation
- Roasting
- Calcination

11. —---------- and cesium have very low melting points
- Thallium
- Radium
- Gallium
- Copper

12. —---------- is the hardest natural substance known and has a very high melting point
- Diamond
- Graphite
- Silicon Carbide
- Fullerene

13. —---------- is amphoteric oxide
- Aluminium oxide
- Sodium oxide
- Potassium Oxide
- Silver oxide

14. Magnesium does not react with
- Hot water
- Cold water
- Oxygen
- Acid

15. The reaction of iron (III) oxide with —---------- is used to join railway tracks or cracked machine parts
- Magnesium
- Aluminium
- Manganese
- Zinc

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16. —---------- is the method of protecting steel and iron from rusting by coating them with a thin layer of zinc
- Tinning
- Anodizing
- Galvanisation
- Phosphating

17. The decomposition of vegetable matter into compost is an example of —---------- reaction?
- Endothermic
- Exothermic
- Displacement
- Double displacement

18. Magnesium ribbon burns with a dazzling white flame and changes into a white powder. This powder is called.
- Magnesium oxide
- Magnesium carbonate
- Magnesium hydroxide
- Magnesium nitrate

19. Name the compound used for removing the permanent hardness of water
- Sodium carbonate
- Bleaching powder
- Sodium bicarbonate
- Baking soda

20. —---------- is formed after two or three days of whitewashing and gives a shiny finish to the walls.
- Calcium oxide
- Calcium hydroxide
- Calcium carbonate
- Calcium sulfate

Mathematics

1. A lot of 20 bulbs contain 4 defective bulbs. One bulb is drawn at random from the lot, the probability of this bulb being defective is
- 1/5
- 1/20

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- 4/5
- None of these

2. 2 women and 5 men can together finish an embroidery work in 4 days while 3 women and 6 men can finish in 3 days. Find the number of days taken by one woman alone to finish the work.
- 20 days
- 18 days
- 15 days
- 28 days

3. If HCF and LCM of ‘a’ and 96 are 4 and 9696 respectively, a =
- 44
- 4040
- 4004
- 404

4. From a point Q, the length of the tangent to a circle is 8 cm and the distance of Q from the center is 10 cm, the radius is
- 2 cm
- 7 cm
- 6 cm
- 18 cm

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5. The co-ordinates of center of a circle if extremities of a diameter are (-1,5) and (5,-1) are
- (2,2)
- (-2,-2)
- (4,4)
- None of these

6. The 30th term of the sequence 10, 7, 4 is
- 97
- 77
- -77
- -87

7. If x (x+1)+8 = (x+2) (x-2), then the value of x is
- 12
- -12

- 10
- None of these

8. The average of 40 numbers is 35. If two of the numbers 84 and 62 are not included, then the average of the remaining number is
- 34
- 33
- 30
- 37

9. The average weight of 5 men is 75 kg that of 4 ladies is 63 kg and that of 6 boys is 38 kg. Find the average weight of 15 members.
- 54 kg
- 57 kg
- 60 kg
- Can't be determined

10. A sum of money triples itself in 18 years under simple interest. What is the rate of interest per annum?
- 9.09%
- 11.11%
- 9%
- 18%

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11. The difference between the present ages of father and son is 20 years. The ratio of their ages after 5 years will be 2:1. What is the son's age at present?
- 5 years
- 15 years
- 10 years
- 20 years

12. The area of a triangle whose vertices are A (1,-1), B(-4,6), and C (-3,-5) is
- 24 sq units
- 42 sq units
- O
- None of these

13. If probability of an event A is 1/3 , then P (not A) =
- 1/3
- 2/3

- 1/6
- 1/4

14. The wickets taken by bowlers in 10 cricket matches are as follows: 2,6,4,5,0,2,1,3,3,2. Find the mode of the data.
- 3
- 5
- 6
- 2

15. The 20th term from the last term of the Arithmetic Progression 5,7,9,11,,,,,,,73,75 is
- 35
- -37
- 37
- 47

16. A sum of Rs 700 is to be used to give 7 cash prizes to students in a school. If each cash price is Rs 20 less than the preceding one, the cash given to the first prize winner is
- Rs 140
- Rs 40
- RS 240
- Rs 160

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17. Adding 20% of x to x is equivalent to multiplying x by which of the following?
- 1.05
- 12.5
- 1.20
- 1.15

18. Half the perimeter of a rectangular garden, whose length is 4 m more than its breadth is 36 m. The dimensions of the garden are
- Length = 11 m, breadth = 7m
- Length = 20 m, breadth = 16 m
- Length = 18 m, breadth = 15 m
- None of these

19. A fraction becomes 1/3 when 1 is subtracted from the numerator and it becomes 1/4 when 8 is added to its denominator, then the fraction is

- 12/5
- 7/12
- 5/12
- 11/12

20. In a flower bed, there are 23 rose plants in the first row, 21 in the 2nd row, 19 in the 3rd row, and so on. If there are 5 rose plants in the last row, how many rose plants are there in the flower bed?

- 140
- 190
- 150
- None of these

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