TJEE (Tripura Joint Entrance Examination) 2023 Question Papers

TJEE 2023 Physics Question Paper

1. 90 identical cells are connected in mixed combinations to get maximum current. If the internal resistance of each cell is 1/10th of the load resistance, then the arrangement must be:

- Parallel combination of 3 series of 30 cells each
- Parallel combination of 5 series of 18 cells each
- Parallel combination of 6 series of 15 cells each
- Parallel combination of 9 series of 10 cells each

2. The rating of a heater is 220 V - 100 W. The heating element is cut into two equal sections and then connected in parallel to the same source. Energy generated per second will be:

- 25 J
- 50 J
- 200 J
- 400 J

3. A 50 turn circular coil with a radius of 3.14 cm is carrying a current of 3 A. The magnetic field produced at the center of the coil is

- 3×10^{-6} T
- 3×10^{-5} T
- 3×10^{-4} T
- 3×10^{-3} T

4. The magnetic flux associated with a coil of resistance 10 Ω is given by $\phi = 5t^2 - 4t + 1$ Wb. Current induced in the coil at 0.2 second will be

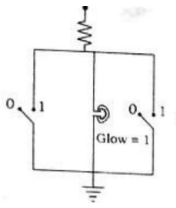
- 0.4 A
- 0.2 A
- 0.04 A
- 0. 02 A

5. The mass defect of the nucleus of a helium atom is 0.0303 amu. Then binding energy per nucleon of a helium nucleus is nearly

- 4 MeV
- 7 MeV
- 14 MeV
- 20 MeV

6. In a photoelectric experiment, if a photon of energies two times and three times that of the work function of the metal is incident successively on the metal, the ratio of maximum velocities of the emitted electrons will be

- 1: √2
- √2: 1
- √2 :√3
- √3 :√2

7. 

Switch closed = 1

- AND
- OR
- NAND
- NOR

8. Starting from O, an object of mass 2 kg is moving along OQ with a velocity of 5 m/s. A 4N transverse force (perpendicular to OQ) is continuously acting on the object. This displacement of that object after the 4 s O point is nearby.

- 13.3 m
- 20.2 m
- 25.6 m
- 39.9 m

9. The time period of oscillation of a simple pendulum hung inside a lift is T. When the lift is moving upward with acceleration g/4, the time period of oscillation of the pendulum will be

- √5T/2
- 2T/√5
- √5/2T
- 2/√5T

10. The momentum of a moving body P varies with time t as $p = at^2 + bt + c$, where a b and c are constants. The force acting on the body at time t = 0 is

- a
- b
- ab
- 2 ba

11. A culvert on a canal is like a section of a circle of radius 40 m. What will be the maximum speed of any car such that it does not detach from the road during a crossing?

- 10 m/s
- 20 m/s
- 30 m/s
- 40 m/s

12. The force required to snap a copper wire of radius 1 mm is 10 N. Then how much force will be required to snap another copper wire of radius 3 mm?

- 90 N
- 45 N
- 30 N
- 10/3 N

13. The energy required to produce a liquid bubble of radius r is E. Then the energy required to produce a bubble of radius 2r and of same liquid is

- 8 E
- 4 E
- 2 E
- E/2

14. The number of waves that reach the shore of a lake per minute is 15. If the wavelength of the waves is 40 m, then the velocity of the waves is

- 600 ms^{-1}
- 60 ms^{-1}
- 54 ms^{-1}
- 10 ms^{-1}

15. The focal length and diameter of the objective of a telescope are 120 cm and 5 cm respectively. If the focal length of the eyepiece of that telescope is 2 cm then the magnifying power of the telescope is

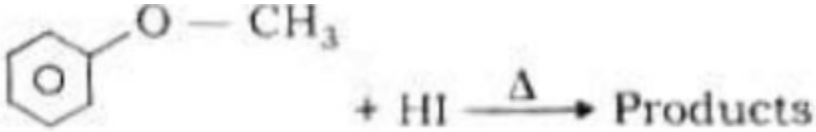
- 24
- 44
- 60
- 120

TJEE 2023 Chemsitry Question Paper

1. Write the reagent for the following transformation

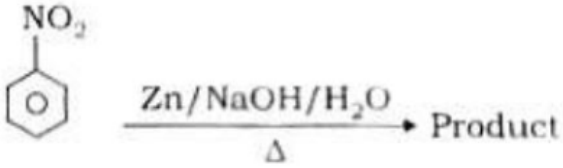
- Alkaline $KMnO_4$
- $K_2Cr_2O_7$ / H_2SO_4 (dil)
- CrO_3 / HOAC/AC_2O
- CrO_3 / 4N H_2SO_4

2. Predict the final product of the following reaction



- Methanol + iodobenzene
- Phenol + methyl iodide
- Phenol + methanol
- Iodobenzene + methyl iodide

3. Identify the product of the following reaction.



- Hydrazobenzene
- Aniline
- Azobenzene
- Azoxybenzene

4. How would you distinguish nucleotides and nucleosides containing their structural features?

- Analysing the presence of phosphate unit
- Analysing the presence of heterocylic base unit
- Analysing the presence of nucleic unit
- Analysing the presence of H-bond unit

5. Affirm the sugar unit being generated upon complete hydrolysis of cellulose.
- D-fructose
- D-glucose
- L-glucose
- D-ribose

6. Predict the key structural aspects of natural rubber
- Composed of random cis-structure and trans-structure
- Completely cis-structure
- Completely trans-structure
- Alternative cis-structure and trans-structure

7. CO(g) damages which part of the human body mostly?
- Liver
- Kidney
- Blood
- Lungs

8. Which of the below-listed compounds remains silent during iodoform
- Ethanol
- Propanone
- 2-phenylethanol
- 1-butanol

9. If the methanol density is 0.8 KgL^{-1} , then find the volume of methanol required to prepare 2.5 L 0.25(M) aqueous methanol solution
- 25 ml
- 40 ml
- 2.5 ml
- 20 ml

10. At 27 °C temperature and 20 atm pressure, a cylinder having a water capacity of 2.82 L is filled with H_2(g). How many round shaped balloons (radius 10.5 cm) can be filled with the aid of available H_2(g) from the cylinder is STP?
- 100
- 10
- 11
- 12

11. 50 cc O 1(M) Ca $(OH)_2$ solution is diluted with water, and the final volume becomes 500 cc. Calculate the pH of the resulting solution.
- 11.69
- 16.31
- 12.31

- 15.69

12. Lithium (m) forms a body-centered cubic lattice whose every edge length of cell is 351 pm. What will be the atomic radius of the Li(m)?
- 300 pm
- 152 pm
- 240 pm
- 75 pm

13. 3 gm of active charcoal is added to 50 ml of 0.06 (N) acetic acid solution. After 1 hour, the mixture is filtered, and the concentration of the filtrate is 0.042 (N). Determine the amount of absorbed acetic acid by every gram of active charcoal in this process.
- 18 mg
- 36 mg
- 42 mg
- 54 mg

14. Which among the following metals produces $H_2(g)$ on reaction with hot soda?
- Mg
- Cu
- Fe
- Zn

15. The increasing ionic character of the halogen hydracids follows which of the following trends?
- HF<HCl<HBr<HI
- HI<HCl<HF<HBr
- HI<HBr<HF<HCl
- HI<HBr<HCl<HF