1to1 GURU

Learn to Lead, Learn to Succeed

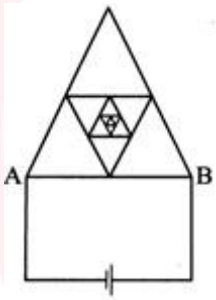
Date :-04/02/2022 **Time :-25 Minutes** **Exam Name :-MHTCET-1to1Guru-4** **Mark :- 30**

PHYSICS

1. The U- tube with limbs of diameter 5 mm and 2mm contains water if surface tension 7 10^{-2} N/ metre , angle of contact zero and density 10^3 kg / metre^3. If g is 10m/sec^2 then the difference in level in the two limbs is

(a) 8.4 cm **(b)** 8.4 mm **(c)** 8.4 metre **(d)** 0.84 mm

2. A frame is made of thin homogeneous wire (as shown in figure). Assuming that the number of successively embedded equilateral triangles (with sides decreasing by half) tends to infinity, where side AB is equal to A, and the resistance of unit length of the wire is ρ, the resistance R_{AB} between points A and B :



(a) $\frac{A\rho(\sqrt{7}-1)}{3}$ **(b)** $\frac{A\rho(\sqrt{7}+1)}{3}$ **(c)** $\frac{A(\sqrt{7}+1)}{3\rho}$

(d) $\frac{\sqrt{7}-1}{3A\rho}$

3. The differential equation of angular S.H.M. is in the order of

(a) 2 **(b)** 0 **(c)** 3 **(d)** 1

4. In a certain double slit experimental arrangement interference fringes of width 1.0 *mm* each are observed when light of wavelength 5000 is used. Keeping the set up unaltered, if the source is replaced by another source of wavelength 6000 , the fringe width will be

(a) 0.5 *mm* **(b)** 1.0 *mm* **(c)** 1.2 *mm* **(d)** 1.5 *mm*

5. If R is radius of the earth and g the acceleration due to gravity on the earth s surface. The mean density of the earth is

(a) $4\pi G/2gR$ **(b)** $3\pi R/4gR$ **(c)** $3g/4\pi RG$

(d) $4RG/3\pi g$

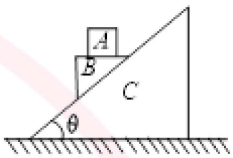
6. N-P-N transistors are preferred to P-N-P transistors because they have :

(a) Low cost **(b)** Low dissipation energy

(c) Capability of handling large power

(d) Electrons having high mobility than holes.

7. In the figure shown, all blocks are of equal mass m . All surfaces are smooth, the acceleration of C w.r.t. ground is



(a) $\frac{2g\sin\theta\cos\theta}{1+3\sin^2\theta}$ **(b)** $\frac{g\sin\theta\cos\theta}{1+3\sin^2\theta}$ **(c)** $\frac{g\sin 2\theta}{\sqrt{1+3\sin^2\theta}}$

(d) $\frac{g\sin\theta\cos\theta}{\sqrt{1+3\sin^2\theta}}$ +

CHEMISTRY

8. Which of the following can participate in linkage isomerism?

(a) NH_3 **(b)** H_2O **(c)** $H_2NCH_2CH_2NH_2$ **(d)** NO_2^-

9. The molecule, ion which is pyramidal in shape is

(a) NO_3^- **(b)** PCl_3 **(c)** CO_3^{2-} **(d)** SO_3

10. Gas equation $pV = nRT$ is obeyed by ideal gas in

(a) Adiabatic process **(b)** Isothermal process

(c) Both a and b **(d)** None of the above

11. Diethyl ether can be regarded as unhydribe o

(a) CH_3-OH **(b)** C_2H_5-OH **(c)** C_2H_5-COOH

(d) CH_3COOH

12. How many P OH bonds are presents in H_3PO_2

(a) 1 **(b)** 2 **(c)** 3 **(d)** O

13. Which one of thr following elements has not been observed to form any compounds?

(a) He **(b)** Ne **(c)** Ar **(d)** All of these

14. What is the cell constant of $\frac{N}{10}$ KCl solution at $25°C$, if conductivity and resistance of a solution is $0.0112\Omega^{-1}$ cm^{-1} and 55.0Ω respectively? [MHT-CET 2020]

(a) 0.616 cm^{-1} **(b)** 0.2 cm^{-1} **(c)** 0.491 cm^{-1}

(d) 2.0 cm^{-1}

MATHMATICS

15. If the lines represented by the equation $6x^2+41x-7y^2=0$ make angles α and β with X-axis, then tan α, tan β =

(a) $-\frac{6}{7}$ **(b)** $\frac{6}{7}$ **(c)** $\frac{7}{6}$ **(d)** $-\frac{7}{6}$

16. $\int x^x(1+\log x)dx =$

(a) x^x+c **(b)** $x^{2x}+c$ **(c)** $x^x\log x+c$

(d) $\frac{1}{2}(1+\log x)^2+c$

17. The area between parabola $y^2=4x$ and its latus rectum is

(a) $\frac{2}{3}$ sq. units **(b)** $\frac{8}{3}$ sq. units **(c)** $\frac{16}{3}$ sq. units

(d) $\frac{32}{3}$ sq. units

18. In the truth table for the statement (~q) ∧ (p ∨ q), the last column as the truth value in the following order is :

(a) FTFT **(b)** FTFF **(c)** TTTT **(d)** TTFT

19. Find the value of $\sqrt{2}\cos\left(\frac{\pi}{4}-A\right)$.

(a) 1 **(b)** $-\cos A+\sin A$ **(c)** $-(\cos A+\sin A)$

(d) $\cos A+\sin A$

20. If $\sec\theta+\tan\theta=4$, then $\sin\theta=$ [MHT-CET 2019]

(a) $\frac{8}{15}$ **(b)** $\frac{7}{8}$ **(c)** $\frac{15}{17}$ **(d)** $\frac{7}{15}$

[MHT-CET 2020]

21. How many integer between 200 and 700 consist of three distinct digits?

(a) 350 **(b)** 360 **(c)** 365 **(d)** 370

22. $\int x^3e^x\,dx =$

(a) $e^x(x^3+3x^2+6x+6)+c$

(b) $e^x(x^3-3x^2-6x+6)+c$

(c) $e^x(x^3-3x^2+6x-6)+c$

(d) $e^x(x^3+3x^2-6x-6)+c$