

MHT CET 2020 Mathematics Memory Based Question Paper PDF

- Q.1** Energy of the incident photon on the metal surface is ' $3W$ ' and then ' $5W$ ', where ' W ' is the work function for that metal. The ratio of velocities of emitted photoelectrons is:
- (a) $1 : \sqrt{2}$
 - (b) $1 : 1$
 - (c) $1 : 2$
 - (d) $1 : 4$
- Q.2** In Young's double slit experiment, green light is incident on the two slits. The interference pattern is observed on a screen. Which one of the following changes would cause the observed fringes to be more closely spaced?
- (a) Reducing the separation between the slits.
 - (b) Using blue light instead of green light.
 - (c) Using red light instead of green light.
 - (d) Moving the screen away from the slits.
- Q.3** The capacitance of a parallel plate capacitor with air as medium is $3\mu\text{F}$. With the introduction of a dielectric medium between the plates, the capacitance becomes $15\mu\text{F}$. The permittivity of the medium in SI unit is: [Given $\epsilon_0 = 8.85 \times 10^{-12}$ SI unit]
- (a) 15
 - (b) 8.845×10^{-11}
 - (c) 0.4425×10^{-10}
 - (d) 5
- Q.4** A potentiometer wire is 4 m long and a potential difference of 3 V is maintained between the ends. The e.m.f. of the cell which balances against a length of 100 cm of the potentiometer wire is:
- (a) 0.50 V
 - (b) 0.60 V
 - (c) 0.75 V
 - (d) 0.25 V
- Q.5** The mass of earth is 81 times the mass of the moon and the distance between their centres is R . The distance from the centre of the earth where gravitational force will be zero is:
- (a) $9R/10$
 - (b) $R/2$
 - (c) $R/81$

(d) $R/4$

Q.6 Two wires A and B of equal lengths are connected in left and right gap of a metre bridge, null point is obtained at 40 cm from left end. Diameters of the wires A and B are in the ratio 3 : 1. The ratio of specific resistance of A to that of B is:

- (a) 8 : 1
- (b) 6 : 1
- (c) 4 : 1
- (d) 3 : 1

Q.7 A charged particle is moving in a uniform magnetic field in a circular path of radius ' R '. When the energy of the particle becomes three times the original, the new radius will be:

- (a) $R/3$
- (b) R
- (c) $3R$
- (d) $\sqrt{3}R$

Q.8 Which among the following methods is NOT suitable for the preparation of alkyl chlorides?

- (a) Addition of HCl to alkene
- (b) Treating alcohols with Lucas reagent
- (c) By heating alcohols with thionyl chloride
- (d) Chlorination of alkanes in presence of sunlight

Q.9 Which among the following is an example of allylic alcohol?

- (a) 2-Phenyl propane-2-ol
- (b) 2-Methylbut-3-en-2-ol
- (c) Propane-1, 2, 3-triol
- (d) Propane-1, 3-diol

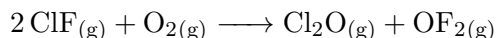
Q.10 A compound has fcc structure. If density of unit cell is 3.4 g cm^{-3} , what is the edge length of unit cell? (Molar mass = 98.99)

- (a) $7.783 \text{ \AA}$
- (b) $5.783 \text{ \AA}$
- (c) $8.780 \text{ \AA}$
- (d) $6.083 \text{ \AA}$

Q.11 Identify the symbol used for water according to Dalton's atomic theory:

- (a) $\oplus$
- (b) $\bigcirc\bigcirc$
- (c) $\bigcirc\bigcirc\bigcirc$
- (d) $\mathbb{D}$

Q.12 If 38.55 kJ of heat is absorbed when 6.0 g of O_2 react with ClF according to reaction:



What is the standard enthalpy of reaction?

- (a) 72.28 kJ

- (b) 205.6 kJ
- (c) 102.8 kJ
- (d) 49.80 kJ

Q.13 If $f(x) = \frac{2x+3}{3x-2}$, $x \neq \frac{2}{3}$, then the function $f \circ f$ is:

- (a) an even function
- (b) an identity function
- (c) a constant function
- (d) an exponential function

Q.14 In a quadrilateral $ABCD$, M and N are the mid-points of the sides AB and CD respectively. If $\vec{AD} + \vec{BC} = t\vec{MN}$, then $t =$:

- (a) 4
- (b) 2
- (c) $1/2$
- (d) $3/2$

Q.15 If the lines given by $\frac{x-1}{2\lambda} = \frac{y-1}{-5} = \frac{z-1}{2}$ and $\frac{x+2}{\lambda} = \frac{y+3}{\lambda} = \frac{z+5}{1}$ are parallel, then the value of λ is:

- (a) $-2/5$
- (b) $2/5$
- (c) $5/2$
- (d) $-5/2$

Q.16 $\int_2^3 \frac{x}{x^2-1} dx =$:

- (a) $(-1/2) \log(8/3)$
- (b) $(1/2) \log(8/3)$
- (c) $(-1/3) \log(8/3)$
- (d) $(1/3) \log(8/3)$

Q.17 The letters of the word 'LOGARITHM' are arranged at random. The probability that arrangements starts with vowel and end with consonant is:

- (a) $7!/9!$
- (b) $18/9!$
- (c) $1/4$
- (d) $1/9$