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PHYSICS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET ENGINEERING ENTRANCE EXAM ONLINE QUESTION PAPER 2019 (SOLVED)



1. IF the charge of electron c , mass of electron m, speed of light in vaccum c and Planck's constant h are taken as fundamental quantities. Then the permeability of vaccum μ_0 can be expressed as

A.
$$-\frac{h}{mc^2}$$

B. $\frac{hc}{me^2}$
C. $\frac{h}{ce^2}$
D. $\frac{mc^2}{he^2}$

2. The velocity of an object moving in a straight line path is given as a function of time by $v = 6t - 3t^2$, where v is in ms^{-1} , t is in s. The average velocity of the object between , t=0 and t=2 s is

A. 0

B. $3ms^{-1}$

C.
$$2ms^{-1}$$

D. $4ms^{-1}$

Answer:

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3. A gun and a target are at the same horizontal level separated by a distance of 600 m. The bullet is fired from the gun with the velocity of $500ms^{-1}$ In order to hit the target , the gun should be aimed to a height h above

the target. The value of h is (Acceleration due

to gravity, $g=10ms^{-2}$)

A. 2.4 m

B. 3.6 m

C. 7.2 m

D. 10.8 m

Answer:

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4. A projectile is thrown in the upward direction making an angle of 60° with the horizontal with a velocity of $140ms^{-1}$. Then the time after which its velocity makes an angle 45° with the horizontal is (Acceleration due to gravity $g = 10ms^{-2}$)

A. 0.5124 s

B. 51.24 s

C. 5.124 s

D. 512.4 s



5. The maximum value of the applied force F such that the block as shown in the arrangement does not move is (Acceleration due to gravity, $g = 10ms^{-2}$)



A. 20 N

B. 15 N

C. 25 N

D. 10 N

Answer:

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6. A rough inclined plane BCE of height $\left(\frac{25}{6}\right)m$ is kept on a rectangular wooden

black ABCD of height 10 m , as shown in the figure. A small block is allowed to slide down from the top E of the inclined plane. The coefficient of kinetic friction between the block and the inclined plane is $\frac{1}{8}$ and the angle of inclination of the inclined plane is $\sin^{-1}(0.6)$. IF the small block finally reaches the ground at a point F, then DF will (Acceleration due to gravity, $g=10ms^{-2}$)







7. Two particles P and Q each of mass 3m lie at rest on the X-axis at point (-a,0) and (+a,0) respectively. A third particle R of mass 2m intially at the origin moves towards the particle Q. IF all the collisions of the system of 3 particles are elastic and head on, the total number of collisions in the system is

A. 2

B. 3

C. 4

D. 5



8. A motor engine pumps 1800 L of water per minute from a well dpth 30 m and allows to pass through a pipe of cross-sectional area $30cm^2$. Then the power of the engine is (Acceleration due to gravity, $g = 10ms^{-2}$)

A. 20.5 kW

B. 15.5 kW

C. 10.5 kW

D. 9.5 kW



9. A solid sphere of 100 kg and radius 10 m moving in a space becomes a circular disc of radius 20 m in one hour. Then the rate of change of moment of inertia in the process is

A.
$$\frac{40}{9}kgm^2s^{-1}$$

B. $\frac{10}{9}kgm^2s^{-1}$
C. $\frac{50}{9}kgm^2s^{-1}$

D. $\frac{25}{9} kgm^2 s^{-1}$

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10. A semicircular plate of mass m has radius r and centre c. The centre of mass of the plate is at a distance x from its centre c. Its moment of inertia about an axis passing through its centre of mass and perpendicular to its plane





11. Two bodies of masses m_1 and m_2 initially at rest at infinite distance apart move towards each other under gravitational force of attraction. Their relative velocity of approach when they are separated by a distance r is (G= universal gravitational constant.)

A.
$$\left[rac{2G(m_1-m_2)}{r}
ight]^{1/2}$$

B. $\left[rac{2G(m_1+m_2)}{r}
ight]^{1/2}$
C. $\left[rac{r}{2G(m_1m_2)}
ight]^{1/2}$
D. $\left[rac{r}{2G}m_1m_2
ight]^{1/2}$



12. A planet is revolving around the sun as shown in the figure. The radius vectors joining the sum and the planet at points A and B are $90 \times 10^6 km$ and $60 \times 10^6 km$, respectively. The ratio of velocities of the planet at the points A and B when its velocities makes angle 30° and 60° with major axis of the orbit is







13. A solid copper cube of 7 cm edge is subjected to a hydraulic pressure of 800 kPa.

The volume contraction of the copper cube is

(Bulk modulus of copper =140 Gpa)

A.
$$196 imes 10^{-3} cm^3$$

B. $19.6 imes 10^{-6} cm^3$

C. $19.6 imes 10^{-3} cm^3$

D. $196 imes 10^3 cm^3$



14. A long cylindrical glass vessel has a pinhole of diameter 0.2 mm at its bottom. The depth to which the vessel can be lowered vertically in a deep water bath without the water entering into the vessel is (surface tension of water, T= $0.07Nm^{-1}$, and accleration due to gravity, $g = 10ms^{-2}$)

A. 14 cm

B. 7 cm

C. 21 cm

D. 28 cm

Answer:

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15. The focal length of a spherical mirror made of steel is 150 cm. IF the temperature of the mirror increases by 200 K, its focal length become (coefficient of linear expansion of steel $\alpha = 12 \times 10^{-60} C^{-1}$)

A. 186.3 cm

B. 153.6 cm

C. 150.036 cm

D. 150.36 cm

Answer:

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16. A metal rod of length 10 cm and area of cross section $2.8 \times 10^{-4}m^2$ is covered with a non-conducting substance. One end of it is maintained at $80^{\circ}C$, while the other end is

put in ice at $0^{\circ}C$. It is found that 20 gm of ice melts of 5 min. The thermal conductivity of the metal in $Js^{-1}m^{-1}K^{-1}$ is (Latent heat of ice is $80calg^{-1}$).

- A. 70
- B. 80
- C. 90
- D. 100



17. A gas expands with temperature according to the relation, $V = kT^{2/3}$ where k is a constant Word done when the temperature changes by 60 K is (R= Universal gas constant).

A. 10 R

B. 20 R

C. 50 R

D. 40 R



18. An ideal gas is taken through the cycle A o B o C o A as shown in the figure . If the net heat supplied to the gas in the cycles is 5J. The magnitude of word done during the process C o A is



A. 5 J

B. 10 J

C. 15 J

D. 20 J

Answer:



19. At T(k), copper (atomic mass=635 u) has fcc unit cell structure with edge length of xA. What is the approximate density of Cu in gcm^{-3} at that temperature? ($N_A=6.0 imes10^{23}mol^{-1}$)A. $rac{42.3}{x^3}$

B. $\frac{423}{x^3}$ C. $\frac{423}{x^3}$ D. $\frac{212}{x^3}$



20. The number of moles of solute present in the solutions of I, II and III is respectively I. 500 mL of 0.2 M NaOH II. 200 mL of 0.1 N H_2SO_4 III. 6g of urea in 1 kg of water

A. 0.1,0.01,0.1

B. 0.1,0.02,0.1

C. 0.2,0.01,0.1

D. 0.1,0.01,0.2



21. 6g of a mixture of napthalene $(C_{10}H_8)$ and anthracene $(C_{14}H_{10})$ is dissolved in 300 gram of benzene. If the depression in freezing point is 0.70 K, the composition of napthalene and anthracene in the mixture respectively in g are (molal depression constant of benzene is 5.1 K mol^{-1})

A. 2.60,3.40

B. 3.40,2.60

C. 2.90,3.10

D. 3.10,2.90

Answer:



22. Under which of the following conditions E

value of the cell, for the cell reaction given is maximum?

$$Zn(s)+Cu^{2+}(aq) \Leftrightarrow Cu(s)+Zn^{2+}(aq)$$

$$\begin{pmatrix} \frac{2.303 \ RT}{F} \text{ at } 298 \ \text{K} = 0.059 \ \text{V}, \\ E_{\text{Zn}^{2^{2}}/\text{Zn}}^{\circ} = -0.76 \ \text{V}, E_{\text{Cu}^{2^{*}}/\text{Cu}}^{\circ} = +0.34 \ \text{V} \end{pmatrix}$$

. .

A.
$$C_1 = 0.1 M, C_2 = 0.01 M$$

B.
$$C_1 = 0.01 M, C_2 = 0.1 M$$

C.
$$C_1 = 0.1M, C_2 = 0.2M$$

D.
$$C_1 = 0.2M, C_2 = 0.1M$$

Answer:

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23. In the first order thermal decomposition of $C_2H_5I(g)
ightarrow C_2H_4(g) + HI(g)$, the reactant in the beginning exerts a pressure of 2 bar in a closed vessel at 600 K. IF the partial pressure of the reactant is 0.1 bar after 100 minutes at the same temperature the rate constant in -1min is $(\log 2 = 0.3010)$

A. $6.0 imes10^{-4}$

 $\mathsf{B.6.0} imes 10^{-3}$

C. $3.0 imes 10^{-3}$

D. $3.0 imes10^{-4}$



24. Identify the correst statements from the following:

I. Sulphur sol is an example of a multimolecular colloid.

II. Tyndall effect is observed when the diameterof the dispersed particles is not much smallerthan the wavelength of the light used.III. The process of removing a dissolved

substance from a colloidal solution by means of diffusion through a suitable membrane is called peptisation.

IV.Eosin,gelatin are examples of negatively

charged sols,

A. I,II,III

B. I,II,IV

C. I,III,IV

D. II,III,IV





25. Which of the following statements is not correct?

I. Magneitite II. Kaolinite III. Siderite IV.

Calamine

A. I,II,III

B. II,III,IV

C. I,II only

D. III,IV only



26. Which of the following statements is not correct?

A. From SO_2 to TeO_2 reducing power decreases

B. The order of boiling points of hydrides

of 16^{th} group elements in

$H_2S < H_2Se < H_2Te < H_2O$

C. Rhombic sulphur has S_8 molecules while

monoclinic sulphur has S_6 molecules.

D. The bond angle in ozone molecule is

 117°

Answer:

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27. Noble metals, like gold and platinum are soluble in which of the following mixtures?

A. 1:1 mixture of conc. HNO_3 and conc.

 H_2SO_4

B. 1:3 mixture of conc. HCI and conc. HNO_3

C. 1:3 mixture of conc. HNO_3 and conc. HCI

D. 1:3 mixture of conc. H_2SO_4 and conc.

HCI







28. Identify the set of acidic oxides.

A. Na_2O, CaO, BaO

 $\mathsf{B}.\,ZnO,\,PbO,\,BeO$

 $\mathsf{C}.CO, NO, N_2O$

 $\mathsf{D}.\,Mn_2O_7,\,CrO_3,\,V_2O_6$

Answer:

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29. The wavelengths of light absorbed by the complexes $[Ni(H_2O)_6]^{2+}$, $[Ni(en)_3]^{2+}$, $[Ni(H_2O)_4en]^{2+}$ are $\lambda_1, \lambda_2, \lambda_3$ respectively. The correct order of wavelengths is

A.
$$\lambda_1 > \lambda_2 > \lambda_3$$

B. $\lambda_3 > \lambda_2 > \lambda_1$
C. $\lambda_1 > \lambda_3 > \lambda_2$
D. $\lambda_2 > \lambda_3 < \lambda_1$



30. $KMnO_4$ oxidises $S_2O_3^{2-}$ to SO_4^{2-} in medium x and NO_2^- to NO_3^- in medium y,x and y are respectively.

A. acidic,basic

B. acidic,acidic

C. acidic, neutral

D. neutral,acidic

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31. Match the following:

	List I		List II
(A)	Teflon	L	ShClg
(B)	Anionic polymerisation	H.	C 2F4
(C)	Cationic polymerisation	₩.	Bakelite
(D)	Thermosetting polymer	IV.	Polystyrene
		V.	RLi

.

A. II I V III

B. II V I IV

C. || V | |||

D. V II I IV





32. Identify the correct set of monosaccharides present in sucrose (X), lactose (Y) and maltose (Z).

A. glucose,fructose galactose, glucose
B. glucose,fructose galactose, glucose
glucose,fructose galactose, glucose

C. glucose,glu	cose	gala	actose,	glucose			
glucose,fru	ctose						
D. galactose,	glucos	e g	glucose,	fructose			
glucose,fructose							

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33. Which of the following are broad spectrum

antibiotics?

Penicillin G	Chloram- phenicol	Ofloxacín	Ampicillin	
(I)	()	(111)	(IV)	

A. I, II only

B. I, II, III

C. II, III, IV

D. I, III only



34. Arrange of following organic halides in correct order of reactivity towards $S_N 2$ displacement.

$$\begin{array}{ccc} (\mathrm{CH}_3)_2\mathrm{C}(\mathrm{Br})\mathrm{CH}_2\mathrm{CH}_3, \ \mathrm{Br}\mathrm{CH}_2(\mathrm{CH}_2)_3\mathrm{CH}_3, \ \mathrm{CH}_3\mathrm{CH}(\mathrm{Br}) \\ (P) & (Q) & (\mathrm{CH}_2)_2\mathrm{CH}_3 \\ & (R) \end{array}$$

A. P > Q > RB. R > P > QC. P > R > Q

 $\mathsf{D}.\,Q>R>P$



35. The bond angle between C-O and O-H bonds in alcohols is close to

A. $109^{\,\circ}$

B. 120°

C. 180°

D. 90°





36. Identify Z in the following sequence of reactions.







Β.

A.





С.

D.

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37. Identify X,Y,Z in the following reactions

sequence.













38. 2-methyl-2 butane on hydration gave an alcohol X. Isomers of X could be prepared from which of the following?





39. Acetic acid on heating with NH_3 forms A. When A reacts with $LiAH_4$ followed by

hydrolysis gives B. When B is heated with chloroform in KOH medium gives C. What are B and C respectively?

A. CH_3CONH_2, CH_3CH_2NC

 $\mathsf{B.}\,CH_3CH_2NH_2,\,CH_3CH_2NC$

$C. CH_3CH_2NH_2, CH_3COOH$

 $\mathsf{D}.\,CH_3CH_2CH_2NH_2,\,CH_3CH_2NC$

Answer:

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