

Max Mark: 200

Date: 28.08.2022

ABHIMANYU BATCH PHYSICS : PART TEST

Topic: Alternating Circuit

- 1. The instantaneous voltage through a device of impedance 20 Ω is V = 80 sin 100 π t. The effective value of the current is
 - (a) 3A (b) 2.828 A (c) 1.732 A (d) 4 A
- 2. The average power dissipated in the resistor is

(a) $P = \frac{1}{2}i_m^2 R$ (b) $P = \frac{1}{4}i_m^2 R$ (c) $P = \frac{3}{4}i_m^2 R$ (d) $P = i_m^2 R$

- 3. If the frequency is doubled, what happens to the capacitive reactance and the current?
 - (a) Capacitive reactance is halved, the current is doubled
 - (b) Capacitive reactance is doubled, the current is halved
 - (c) Capacitive reactance and the current are halved
 - (d) Capacitive reactance and the current are doubled
- 4. Voltage and current in an AC circuit are given by
 - $V = 5 \sin (100 \pi t \pi / 6)$ volts

(c)

- and I = 4 sin(100 π t + $\pi/6$) ampere. Then
- (a) voltage leads the current by 30°
- (c) current leads the voltage by 60°
- (b) current leads the voltage by 30°
- (d) voltage leads the current by 60°

5. To express AC power in the same form as DC power, a special value of current is defined and used, is called

- (a) root mean square current (I_{rms})
- (b) effective current
- induced current (d) Both (a) and (b)



6. A light bulb is rated at 100 W for a 220 V supply. Find the resistance of the bulb (a) 48 Ω (b) 484 Ω (c) 480 Ω (d) 350 Ω The peak value of alternating current is $5\sqrt{2}$ A. The mean square value of current will be 7. $5\sqrt{2}$ A 2.5 A 5 A (b) (c) None of these (a) (d) 8. If reading of an ammeter is 10 A, the peak value of current is $\frac{5}{\sqrt{2}}$ A $\frac{10}{\sqrt{2}}$ A (b) $20\sqrt{2}$ A $10\sqrt{2}$ A (c) (d) (a) 9. For high frequency, capacitor offers (a) more resistance (b) less resistance (c) zero resistance (d) None of these 10. Alternating current is transmitted to take places (a) at high voltage and lower current (b) at high voltage and high current (c) at low voltage and low current (d) at low voltage and high current 11. An alternating voltage V = V₀ sin ωt is applied across a circuit. As a result the current I = I₀ sin ($\omega t - \pi/2$) flows in it. The power consumed in the circuit per cycle is $0.5 V_0 /_0 W$ $0.707 V_0 /_0 W$ $1.919 V_0 /_0 W$ (d) (a) (b) (c) zero 12. RMS value of AC current is ... A... times its peak value. Here, A refers to 0.704 0.709 (d) 0.705.5 (a) (b) 0.707 (c) has the dimensions to 13. (a) timer (b) mass (c) length (d) frequency 14. The average power dissipated in AC circuit is 2W. If a current flowing through a circuit is 2 A impedance is 1 Ω , what is the power factor factor of the AC circuit? $\frac{1}{\sqrt{2}}$ 0.5 (a) (b) 1 (c) Zero (d)



- 15. A lamp consumes only 50% of maximum power applied in an AC circuit. What will be the phase difference between applied voltage and circuit current?
 - (c) $\frac{\pi}{4}$ rad (d) $\frac{\pi}{2}$ rad $\frac{\pi}{3}$ rad (b) $\frac{\pi}{6}$ rad (a)

In an electrical circuit R, L, C and an AC voltage source area all connected in series. When L is removed from the 16. circuit, the phase difference between the voltage and the current in the circuit is $\frac{\pi}{3}$. If instead, C is removed from the circuit, the phase difference is again $\frac{\pi}{3}$. The power factor of the circuit is

- (d) $\frac{\sqrt{3}}{2}$ $\frac{1}{2}$ (c) $\sqrt{3}$ (b) $\frac{1}{\sqrt{2}}$ (a)
- 17. The impedance of a circuit, when a resistance R and an inductor of inductance are connected in series in an AC circuit of frequency f is

(a)
$$\sqrt{R + 2\pi^2 f^2 L^2}$$
 (b) $\sqrt{R + 4\pi^2 f^2 L^2}$ (c) $\sqrt{R^2 + 4\pi^2 f^2 L^2}$ (d) $\sqrt{R^2 + 2\pi^2 f^2 L^2}$

18. An inductive coil has a resistance of 100 Ω . When an AC signal of frequency 1000 Hz is applied to the coil, the voltage leads the current by 45° . The inductance of the coil is

 $\frac{1}{20\pi}$ 1 $\frac{1}{40\pi}$ $\frac{1}{60\pi}$ (b) (c) (d) (a) 10π

19. A circuit contains a capacitor and inductance each with negligible resistance. The capacitor is initially charged and the charging battery is disconnected. At subsequent time, the charge on the capacitor will

- increase exponentially (a) (b) decreases exponentially remain constant
- (c) decrease linearly (d)

20. The instantaneous values of current and voltage in an AC circuit are given by

I = 6s	$\sin\left(100\pi t + \frac{\pi}{2}\right), V = 5\sin\left(100\pi t - \frac{\pi}{2}\right), \text{ then }$		
(a)	current leads the voltage by 45°	(b)	voltage leads the current by 90°
(c)	current leads the voltage by 90°	(d)	voltage leads the current by 45°



- 21. In a L–C–R series circuit, the potential difference between the terminals of the inductance is 60 V, between the terminals of the capacitor is 30 V and that across the resistance is 40 V. Then, supply voltage will be equal to (a) 50 V (b) 70 V (c) 130 V (d) 10 V
- 22. In non-resonant circuit, what will be the nature of the circuit for frequencies higher than the resonant frequency? (a) Resistive (b) Capacitive (c) Inductive (d) None of these
- 23. The value of alternating emf E in the given circuit will be



- 24. The reactance of a coil when used in the AC power supply (220 V, 50 cycle s⁻¹) is 50 Ω . The inductance of the coil is nearly
 - (a) 0.16 H (b) 0.22 H (c) 2.2 H (d) 1.6 H
- 25. In terms of q, the voltage equation for series L–C–R circuit is given by

(a)
$$L\frac{dq}{dt} + R\frac{dq}{dt} + q / C = V_m \sin \omega t$$
 (b) $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + q / C = V_m \sin \omega t$
(c) $L\frac{d^2q}{dt} - R\frac{dq}{dt} + q / C = V_m \sin \omega t$ (d) $L\frac{d^2q}{dt} - R\frac{dq}{dt} - q / C = V_m \sin \omega t$





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ABHIMANYU BATCH CHEMISTRY: PART TEST Topic: Alkyl Halide

26.	Which	of the following has the highest melting point?							
	(a)	o-Dichlorobenzene	(b)	p- Dichlorobenzene					
	(c)	m - Dichlorobenzene	(d)	Chlorobenzene					
27.	Aceton	itrile is prepared by treating an alcohol	ic solution of meth	nyl iodide with					
	(a)	Silver cyanide	(b)	Potassium cyanide					
	(c)	Hydrogen cyanide	(d)	Ammonia					
28.	The en	d product (B) in the following sequence	e of reactions is Cl	H_3Cl KCN [A] $H^+/H_2O[B]$					
	(a)	CH ₃ COOH (b) HCOOH	(c)	CH ₃ NH ₂ (d) CH ₃ COCH ₃					
29.	C_2H_5I	$\xrightarrow{\text{AgNO}_2} X$							
		(major product)							
	Here X	is							
				$C_2H_5 - N^{\mu O}$					
	(a)	$C_2H_5 - O - N-O$	(b)	0					
	(c)	$C_2H_5 - N - O$	(d)	$C_2H_5 - N = N - C_2H_5$					



30. Identify the set of reagent/reaction conditions 'X' and 'Y' in the following set of transformations:

$$\begin{array}{cccc} CH_3 - CH_2 - CH_2Br & X & Product & Y & CH_3 - CH - CH^3 \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ &$$

- (a) X = Dilute aqueous NaOH, Y = HBr
- (b) X = Alcoholic NaOH, Y = HBr
- (c) X = Dilute aqueous NaOH, $Y = Br_2 / CHCl_3$
- (d) $X = Alcoholic NaOH, Y = Br_2 / CHCl_3$
- 31. Which of the following reactions is an example of nucleophilic substitution reaction ?
 - (a) $2 RX + Na \rightarrow R R + 2 NaX$
 - (b) $RX + H_2 \rightarrow RH + HX$
 - (c) $RX + Mg \rightarrow RMgX$
 - (d) $RX + KOH \rightarrow ROH + KX$
- 32. Order of reactivity towards nucleophilic substitution reaction of the compounds





33. Reaction of ethyl chloride with sodium leads to formation of (a) Ethane (b) Propane (c) n-butane (d) n-pentane 34. Which is not present in Grignard reagent? (b) (d) - COOH group (a) Methyl group Magnesium (c) Halogen 35. Which chloride is least reactive with the hydrolysis point of view ? CH₃Cl CH₃CH₂Cl (CH₃)₃CCl (a) (b) (c) (d) $CH_2 = CH - Cl$ Which of the following statements is incorrect? 36. (a) C_2H_5Br reacts with alc. KOH to form C_2H_5OH (b) C₂H₅Br when treated with metallic sodium gives n-butane (c) C₂H₅Br when treated with sodium ethoxide forms diethyl ether (d) C₂H₅Br with AgCN forms ethyl isocyanide 37. In the following sequence of reactions CH₃CH₂CH₂Br KOH /alc (A) HBr **(B)** KOH (aq) (C) The product (C) is (b) Propan-1-ol (c) Propyne (d) Propene (a) Propan-2-ol 38. Methyl chloride reacts with silver acetate to yield Acetaldehyde (b) Acetyl chloride Methyl acetate (d) Acetic acid (a) (c) 39. For a given alkyl group the densities of the halides follow the order RI < RBr < RCl(b) RI < RCl < RBr(c) R Br < RI < RCl(a) (d) RCl < RBr < RI40. Which of the following haloalkanes is most reactive? (a) 1-Chloropropane (b) 1-Bromopropane (c) 2- Chlorpropane (d) 2-Bromopropane



- 41. The hybridization state of carbon atoms in the product formed by the reaction of ethyl chloride with aqueous potassium hydroxide is
 - (a) sp (b) sp^2 (c) sp^3 (d) sp^3d
- 42. In which of the following reactions, the product is an ether?
 - (a) $C_6H_6 + CH_3COCl/anhydrous AlCl_3$ (b) $C_2H_5Cl + aq. KOH$
 - (c) $C_6H_6 + C_6H_5COCl / anhydrous AlCl_3$ (d) $C_2H_5Cl + C_2H_5ONa$
- 43. For the reaction

$$\frac{\text{CH}_3 - \text{CH}_2 - \text{CH}(\text{Cl}) \text{ CH}_3}{475 \text{ K}} \xrightarrow{\text{KOH (alc)}}$$

 $C_2H_5 - CH = CH_2(A) + CH_3 - CH = CH - CH_3(B)$

- (a) 'A' Predominates
- (b) 'B' Predominates
- (c) Both 'A' and 'B' are formed in equal molar ratio
- (d) The product ratio depends upon the temperature.
- 44. p-Dichlorobenzene has higher melting point than its o- and m-isomers because
 - (a) p-Dichlorobenzene is more polar than o- and m-isomer
 - (b) p-Isomer has a symmetrical crystalline structure
 - (c) Boiling point of p-isomer is more than o and m-isomer
 - (d) All the three are correct reasons



45. Identify the end product (C) in the following sequence :

	C ₂ H ₅ -	$\xrightarrow{\text{OH}}_{\text{Pyridine}} A \xrightarrow{\text{KC}}_{\text{Pyridine}} A$	CN (alc)	$\xrightarrow{\text{B H}_2\text{O/H}^+}\text{C}$					
	(a)	$C_2H_5-CH_2NH_2\\$			(b)	$C_2H_5-CONH_2$			
	(c)	C_2H_5 –COOH			(d)	$C_2H_5 - NH_2 + HCOO$	ΟH		
46.	CH ₃ C	H ₂ CH ₂ Cl alc.KOH	\rightarrow HB	$\xrightarrow{r} \xrightarrow{C} \xrightarrow{Na/ether} \xrightarrow{D}$					
	In the	above reaction, the	product I	D is					
	(a)	Propane	(b)	2,3-Dimethylbutane	(c)	Hexane	(d)	Allyl bromide	
47.	CH ₃ N	IgBr is an organom	etallic co	mpound due to :					
	(a)	$Mg-Br \ bond$	(b)	$C-Mg \ bond$	(c)	$C - Br \ bond$	(d)	$C-H \ bond$	
48.	Which of the following is an ambident nucleophile?								
	(a)	H^{+}	(b)	CN^{-}	(c)	AlCl ₃	(d)	SO_{4}^{2-}	
49.	Dehydrohalogenation is possible with								
	(a)	(CH ₃) ₃ CCl	(b)	$(C_6H_5)_3CBr$	(c)	CH ₃ Br	(d)	Both (a) and (b)	
50.	Which	one of the followin	ng reacts	with haloalkane to for	rm nitroa	alkane as a major prod	duct?		
	(a)	KNO ₂	(b)	AgNO ₂	(c)	AgNO ₃	(d)	HNO ₂	

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1.	(b)	2.	(a)	3.	(a)	4.	(c)	5.	(d)
6.	(b)	7.	(a)	8.	(d)	9.	(b)	10.	(a)
11.	(d)	12.	(b)	13.	(d)	14.	(a)	15.	(a)
16.	(c)	17.	(c)	18.	(b)	19.	(d)	20.	(c)
21.	(a)	22.	(c)	23.	(c)	24.	(a)	25.	(b)

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CHEMISTRY: PART TEST ANSWER KEY Topic: Alkyl Halide

26.	(b)	27.	(b)	28.	(a)	29.	(b)	30.	(b)
31.	(d)	32.	(c)	33.	(c)	34.	(d)	35.	(d)
36.	(a)	37.	(a)	38.	(c)	39.	(d)	40.	(b)
41.	(c)	42.	(d)	43.	(b)	44.	(b)	45.	(c)
46.	(b)	47.	(b)	48.	(b)	49.	(a)	50.	(b)