

**BJNP***Learning with the Speed of Mumbai and the Tradition of Kota***Max. Marks: 60****Date: 27.08.2022**

**ABHIMANYU BATCH**  
**PHYSICS : DCT**  
**Topic: Alternating Circuit**

1. The induced emf of a generator when the flux of poles is doubled and speed is doubled  
(a) becomes half      (b) remains same      (c) becomes double      (d) becomes 4 times
2. If the coils of a transformer are made up of thick wire, then  
(a) eddy currents loss will be more      (b) magnetic flux leakage is reduced  
(c) Joule's heating loss is increased      (d) Joule's heating loss is reduced
3. If a transformer of an audio amplifier has output impedance  $8000 \Omega$  and the speaker has input impedance of  $8 \Omega$ , the primary and secondary turns of this transformer connected between the output of amplifier and to loud speaker should have the ratio  
(a)  $1000 : 1$       (b)  $100 : 1$       (c)  $1 : 32$       (d)  $32 : 1$
4. Which of the following is not transducer?  
(a) Loudspeaker      (b) Amplifier      (c) Microphone      (d) All of these
5. For high frequency, capacitor offers  
(a) more resistance      (b) less resistance      (c) zero resistance      (d) None of these
6. If the power factor changes from  $\frac{1}{2}$  to  $\frac{1}{4}$ , then what is the increase in impedance in AC?  
(a) 20%      (b) 50%      (c) 25%      (d) 100%
7. The maximum value of AC in a circuit is 707 V. Its rms value is  
(a) 70.7 V      (b) 100 V      (c) 500 V      (d) 707 V  
(e) 7.07 V
8. Which current do not change direction with time?  
(a) DC current      (b) AC current      (c) Both (a) and (b)      (d) Neither (a) nor (b)

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**Space for Rough Work**





9. Which of the following represents the value of voltage and current at what instant?
- (a)  $V_m \sin \omega t, i_m \sin \omega t$  (b)  $V_m \cos \omega t, i_m \cos \omega t$   
 (c)  $-V_m \sin \omega t, -i_m \sin \omega t$  (d)  $-V_m \cos \omega t, -i_m \cos \omega t$
10. A  $60 \mu\text{F}$  capacitor is connected to a  $110 \text{ V}$ ,  $60 \text{ Hz}$  AC supply. The rms value of the current in the circuit is
- (a)  $2 \text{ A}$  (b)  $2.49 \text{ A}$  (c)  $1.85 \text{ A}$  (d)  $2.05 \text{ A}$
11. A group of electric lamps having total power rating of  $600 \text{ W}$ ,  $200 \text{ V}$  is supplied by an AC voltage  $V = 169 \sin(314 t + 60^\circ)$ . The rms value of the current is
- (a)  $10 \text{ A}$  (b)  $9.04 \text{ A}$  (c)  $1.48 \text{ A}$  (d)  $8 \text{ mA}$
12. In an AC circuit the instantaneous values of emf and current are  $e = 200 \sin 300t$  volt and  $i = 2 \sin \left( 300t + \frac{\pi}{3} \right)$  amp. The average power consumed (in watts) is
- (a)  $200$  (b)  $100$  (c)  $50$  (d)  $400$
13. The peak value of AC voltage on a  $220 \text{ V}$  mains is
- (a)  $240\sqrt{2} \text{ V}$  (b)  $230\sqrt{2} \text{ V}$  (c)  $220\sqrt{2} \text{ V}$  (d)  $200\sqrt{2} \text{ V}$
14. Alternating current can not be measured by DC ammeter because
- (a) AC cannot pass through DC ammeter  
 (b) AC changes direction  
 (c) average value of current for complete cycle is zero  
 (d) DC ammeter will get damaged
15. An AC source is  $120 \text{ V}$ - $60 \text{ Hz}$ . The value of voltage after  $\frac{1}{720} \text{ s}$  from start will be
- (a)  $20.2 \text{ V}$  (b)  $42.4 \text{ V}$  (c)  $84.8 \text{ V}$  (d)  $106.8 \text{ V}$

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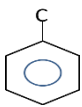




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**ABHIMANYU BATCH**  
**CHEMISTRY: DCT**  
**Topic: Alkyl Halide**

16. Which of the following reactants can be employed to prepare 1-Chloropropane?
- Propene and HCl in presence of peroxides
  - Propene and HCl in absence of peroxides
  - Propene and  $\text{Cl}_2$  followed by treatment with aq. KOH
  - Propan-1-ol and  $\text{SOCl}_2$ /pyridine
17. The best method to prepare fluoroethane is
- $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HF}/\text{H}_2\text{SO}_4, \Delta}$
  - $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HF}/\text{SbF}_5, \Delta}$
  - $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Hg}_2\text{F}_2, \Delta}$
  - $\text{C}_2\text{H}_6 + \text{F}_2 \xrightarrow{h\nu}$
18. The product formed when benzenediazonium chloride is treated with CuBr/HBr is
- Bromobenzene
  - Chlorobenzene
  - 1,3-Dibromobenzene
  - 1,4-Dichlorobenzene
19. Which of the following cannot be prepared by direct halogenations of benzene?
- Iodobenzene
  - Chlorobenzene
  - Bromobenzene
  - Fluorobenzene
20. Diazonium salts +  $\text{Cu}_2\text{Cl}_2$  + HCl  $\rightarrow$   The reaction is
- Chlorination
  - Sandmeyer's reaction
  - Darzen reaction
  - Kharasch reaction

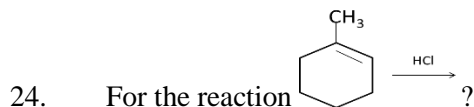
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21. Which reagent cannot be used to prepare an alkyl halide from an alcohol?
- (a)  $\text{HCl} + \text{ZnCl}_2$       (b)  $\text{NaCl}$       (c)  $\text{PCl}_5$       (d)  $\text{SOCl}_2$
22. The catalyst used in the preparation of an alkyl chloride by the action of dry  $\text{HCl}$  on an alcohol is
- (a) Anhydrous  $\text{AlCl}_3$       (b)  $\text{FeCl}_3$       (c) Anhydrous  $\text{ZnCl}_2$       (d)  $\text{Cu}$
23. Darzen's procedure is the best method for preparing alkyl halide because
- (a) The reaction goes to completion  
 (b) The reagent thionyl chloride is cheap  
 (c) Both the byproducts are gaseous and escape easily leaving behind pure alkyl halide  
 (d) The reaction of alcohol with  $\text{PCl}_5$  is reversible



The product formed is

- (a)       (b)       (c)       (d) 

25. The reaction conditions leading to the best yield of  $\text{C}_2\text{H}_5\text{Cl}$  are :
- (a)  $\text{C}_2\text{H}_6$  (excess) +  $\text{Cl}_2$  UV light →  
 (b)  $\text{C}_2\text{H}_6 + \text{Cl}_2$  Dark, Room temp. →  
 (c)  $\text{C}_2\text{H}_6 + \text{Cl}_2$  (excess) UV light →  
 (d)  $\text{C}_2\text{H}_6 + \text{Cl}_2$  UV light →

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26. The reagents required to obtain 1-iodobutane from 1-butene is /are
- (a)  $I_2/\text{red P}$  (b)  $KI$   
(c)  $HI/H_2O_2$  (d)  $HBr/H_2O_2$  and  $KI/\text{acetone}$
27. The reaction  $C_3H_8 + Cl_2 \xrightarrow{\text{Light}} C_3H_7Cl + HCl$  is an example of
- (a) Electrophilic Addition reaction (b) Free radical substitution reaction  
(c) Oxidation reaction (d) Addition of halogen reaction
28.  $(CH_3)_2CHCl + NaI \rightarrow (CH_3)_2CHI + NaCl$   
The above reaction is known as
- (a) Perkin's reaction (b) Finkelstein reaction  
(c) Stephan's reaction (d) Sabatier and Sanderson's reaction
29. Benzyl chloride ( $C_6H_5CH_2Cl$ ) can be prepared from toluene by chlorination with
- (a)  $PCl_5$  (b)  $SOCl_2$  (c)  $Cl_2/h\nu$  (d)  $NaOCl$
30. Chlorobenzene is prepared commercially by
- (a) Grignard's reaction (b) Wurtz-fittig reaction  
(c) Raschig process (d) Remier-Tiemann reaction

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**PHYSICS: DCT ANSWER KEY**  
**Topic: Alternating Circuit**

1.	(d)	2.	(d)	3.	(a)	4.	(b)	5.	(b)
6.	(d)	7.	(c)	8.	(a)	9.	(a)	10.	(b)
11.	(c)	12.	(b)	13.	(c)	14.	(c)	15.	(c)

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16.	(d)	17.	(c)	18.	(a)	19.	(d)	20.	(b)
21.	(b)	22.	(c)	23.	(c)	24.	(a)	25.	(a)
26.	(d)	27.	(b)	28.	(b)	29.	(c)	30.	(c)