eat	Total No. of Pages : 1
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M.Phil./Ph.D. Entrance Examination, May - 2019 (Special Drive) CHEMISTRY/APPLIED CHEMISTRY/INDUSTRIAL CHEMISTRY

•	Day and Date : Wednesday, 22 - 05 - 2019 Total Marks : 100 Fime : 10.00 a.m. to 12.00 Noon.							
Insti	cuctio	ns:	1) 2) 3) 4)	Each question Answers show darkening the Use black ball	appropriate opti	in on or 1	marking the circle. Do not make any	
			5)6)7)	Rough work sh paper.	ructions given on the calculus of the calculus	ne s	sheet provided at the end of question	
1)	Many journals and editors encourage to use voice because it is less verbose and unambiguous.							
	A)	simp	le		B)	complex	
	C)	activ	e		D)	passive	
2)	Pun	ishme	nt fo	or copyright vi	olation is	•		
	A)	3 year	ars a	nd 3 lakhs	B)	1 year and 1 lakh	
	C)	5 yea	ars a	nd 5 lakhs	D)	3 years and 5 lakhs	
3)		ometł imuni	_		ror, it must b	e	understood that interpersonal	
	A)	irrev	ersib	le	В)	reversible	
	C)	forgi	vabl	e	D)	forgettable	

4)	An	An example of a communication channel is							
	A)	context	B)	noise					
	C)	feedback	D)	face - to - face conversation					
5)	Mes	Message is a signal that serves as a							
	A)	stimuli for a mass audience							
	B)	stimuli for a speaker							
	C)	noise reduction							
	D)	stimuli for a receiver							
6)		A researcher divides his population into certain groups and fixes the size of the sample from each group. It is called							
	A)	stratified sample	B)	quota sample					
	C)	cluster sample	D)	all of the above					
7)	Ger	Generalized conclusion on the basis of a sample is technically known as							
	A)	statistical, inference of external validity of the research							
	B)	data analysis and interpretion							
	C)	parameter inference							
	D)	all of the above							
8)	Which of the following is not an essential element of report writing?								
	A)	Research Methodology							
	B)	Reference							
	C)	Conclusion							
	D)	None of these							

A common test in research demands much priority on							
A)	Reliability	B)	Useability				
C)	Objectivity	D)	All of the above				
Which of the following is not true about e journals?							
A)) They are distributed through digital methods						
B)	They also have editors or editorial boards						
C)	C) They are publications of serial nature						
D)	They are always free of cost						
When reading a journal article you should do what?							
A)	Use the same ideas for pour project	et					
B)	Accept their ideas - after all they ar	e pul	blished authors				
C) Approach it with a questioning style							
D)	Read it as a way of obtaining more information						
Whether Library is a system?							
A)	Yes, it has various sections as sub-systems coordinating each other forming a system						
B)	No, it cannot be a system						
C)	It is quite impossible						
D)	Library is separate from a system						
	A) C) Whi A) C) C) Who A) C) C) Who C)	 A) Reliability C) Objectivity Which of the following is not true about A) They are distributed through digita B) They also have editors or editorial C) They are publications of serial natu D) They are always free of cost When reading a journal article you shou A) Use the same ideas for pour project B) Accept their ideas - after all they art C) Approach it with a questioning style D) Read it as a way of obtaining more Whether Library is a system? A) Yes, it has various sections as suforming a system B) No, it cannot be a system C) It is quite impossible 	A) Reliability B) C) Objectivity D) Which of the following is not true about e journal and true about e journal article you should do an another the same ideas for pour project B) Accept their ideas - after all they are public Approach it with a questioning style D) Read it as a way of obtaining more information as yestem Whether Library is a system? A) Yes, it has various sections as sub-systeming a system B) No, it cannot be a system C) It is quite impossible				

13)		_ is zero dimensional nanostructure							
	A)	Thin film	B)	Nano wire					
	C)	Fullerene	D)	Carbon Nanotube					
14)	General chromatography technique involves								
	A)) Recovery of separated substances							
	B)	Separation of the adsorbed substance (s) by mobile phase							
	C)	Adsorption or retention of a substance (s) on the stationary phase							
	D)	All of the above							
15)	Which of the following components of a UV-visible spectrometer is used to focus the light from the lamp into a single beam?								
	A)	Monochromator	B)	Slit					
	C)	Cuvette	D)	Mirror					
16)	Nephelometry is concerned with measurement of light from a cuvette containing suspended particles in a solution.								
	A)	scattered	B)	transmitted					
	C)	Both (A) and (B)	D)	None of the above					
17)	The sources of neutron employed in neutron activation analysis method are								
	—— A)	Reactors	B)	Radionuclides					
	C)	Accelerators	D)	All the above					
18)	In atomic emission spectroscopy, emission of electron is achieved using								
-	A)	flame	B)	arc					
	C)	X-ray emission	D)	All the above					

- 19) Differential scanning calorimetry (DSC) is a technique in which the —— flow difference between the sample and reference material is monitored while both are subjected to the controlled temperature program.
 - A) heat

B) mass

C) temperature

D) enthalpy

- 20) In TGA the graph is preferably plotted as . .
 - A) mass (mg) Vs temperature/time
 - B) weight (mg) Vs temperature/time
 - C) weight%Vs temperature/time
 - D) weight (g) Vs temperature/time
- 21) Which of the following molecules is IR active?
 - A) H,

B) Cl,

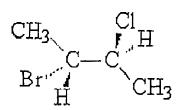
C) HC1

- D) O₂
- 22) Which of the following carbocations is the least stable?
 - A) Methyl

B) Primary

C) Tertiary

- D) Secondary
- 23) Which of the following statements is TRUE for an E1 reaction?
 - A) The E1 reaction requires a strong base to take place
 - B) Primary and secondary alkyl halides are a good substrate for the E1 reaction.
 - C) The E1 reaction occurs during the solvolysis of tertiary alkyl halides
 - D) The rate of the E1 vs. SN1 reaction increases at lower temperature.
- 24) What is the correct name for this molecule?



- A) (2R, 3R)-2-bromo-3-chlorobutane
- B) (2S, 3R)-2-bromo-3-chlorobutane
- C) (2S,3S)-2-bromo-3-chlorobutane
- D) (2R, 3S)-2-bromo-3-chlorobutane

- 25) For the following structure. Which of the disconnections (a-d) is likely to be the best option?
 - Remoxipride
 - A) Disconnection a Disconnection b B) Disconnection c Disconnection d C) D)
- 26) Protection of amines can be carried out as A) Dithioacetal t-BOC B) Oxathioacetal C) THP ethers D)
- 27) Which of the following organometallic compounds is the strongest base? A) (CH₂)₂CuLi B) CH,Li
 - CH₃ZnBr D) CH₂MgBr C)
- 28) When a material is synthesised in Teflon lined closed vessel at 150°C in presence of water, the method is called as A) hydrothermal method sol-gel method B)
 - C) solution combustion method D) co-precipitation method
- 29) Which of the following component of the XRF spectrometer induces fluorescent radiation?
 - A) Excitation source Energy analyser B) C) X-ray spectrometer D) Detector
- 30) The kinetic energy of the photoelectron is dependent on the atom, which makes XPS useful to identify the oxidation state.
- A) mass B) charge
- number of ESR lines is observed in a compound consisting of four

D)

volume

- non equivalent protons. A) 32 B) 16
- C) 8 D) 4

C) chemical environment

32) Which of the following is used as a standard in Mossbauer spectroscopy? B) Ammonium Sulphate Sodium nitroprusside C) Chromium Nitrate D) Sodium Nitrate

33) Which of the following is not used the reference material in DTA?

A) Al_2O_3

B) SiC₂

C) SrCO₃

D) SnO₂

34) The major product of the following reaction is _____.

B) P(O)Ph₂

C) P(O)Ph₂

D) P(O)Ph₂

35) Choose the correct product of the reaction given below.

A)

B) OCOPh

C) OCOPh

D)

- 36) Trimethyl silyl iodide is used for protection of
 - A) Acids

B) Amines

C) Alcohol

- D) Carbonyl group
- 37) In the following reaction sequence, the structure of the product is

$$A) \qquad \stackrel{\text{Me}}{\underset{\text{H}}{\bigvee}} \stackrel{\text{H}}{\underset{\text{Me}}{\bigvee}} \stackrel{\text{OH}}{\underset{\text{Me}}{\bigvee}}$$

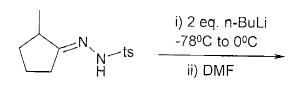
38) Consider the following sequence of reactions:

The above sequence of reaction is known as:

A) Nitro aldol reaction

- B) Michael addition
- C) Directed aldol reaction
- D) Claisen Schmidt reaction

39) Identify the major product formed in the following reaction:



А)

В)

С) СНО

- D) CHO
- 40) The major product formed in the following reaction sequence is,

A) O Me

B) OMe

C) 0

- D) Me
- 41) Four sp³ hybrid orbitals adopt what kind of geometry?
 - A) Octahedral

B) Tetrahedral

C) Trigonal

D) Triangular

42)	42) Which isotope below has highest nuclear binding energy.					
	A)	¹⁶ O	B)	^{32}S		
	C)	⁵⁵ Mn	D)	^{238}U		
43)	Whi	ch one of the following is correct che	mical	formula of Wilkinson's catalyst?		
	A)	[RuCl ₂ (PPh ₃)]	B)	$[RhCl(PPh_3)_3]$		
	C)	[HCo(CO) ₃]	D)	[HCo(CO) ₄]		
44)	The	correct form of chemical potential	is	·		
	A)	$\mu_{i} = (\delta H/\delta n_{i})_{P, V, nj}$				
	B)	$\mu_{i} = (\delta H/\delta n_{i})_{P, ni, nj}$				
	C)	$\mu_{i} = (\delta H/\delta n_{i})_{P, S, nj}$				
	D)	$\mu_{i} = (\delta H/\delta n_{i})_{P, T, nj}$				
45)	Con	inplete the equation : $(\delta S/\delta E)_v = ?$				
	A)	T^{-1}	B)	T		
	C)	$T^{3/2}$	D)	T^2		
46)	One gram mole of a gas at NTP occupies 22.4 liters. This fact was derived from					
	A)	Low of gaseous volume	B)	Avogadros hypothesis		
	C)	Berzelius hypothesis	D)	Dalton's atomic theory		
47)	"En	zymes are				
,	A)	micro-organisms	B)	proteins		
	C)	moulds	D)	inorganic compounds		

M/P ENT - 14

48)	The matrix elements H_{ii} that appear on the diagonal of the determinant are called					
	A)	Coulomb integral	B)	Bond integral		
	C)	Resonance integral	D)	Overlap integral		
49)	Stokes lines in Raman spectroscopy appear on the frequency side of the excitation frequency.					
	A)	High	B)	Low		
	C)	Same	D)	All of them		
50)	Strij A) C)		_ step B) D)	2		
	-		-			

0 0 0

M/P ENT - 14

Rough Work