

Answer C

Rajasthan University Of Health Sciences Jaipur राजस्थान स्वास्थ्य विज्ञान विश्वविद्यालय जयपुर

BPT Entrance Examination 2019

BP'	Finite Examination 2019	Date: 14 October, 2019
1	Prior to experiments with cathode tubes, the smallest particles that made up matter	were believed to be
A	atoms	
В	corpuscles	
С	electrons	
D	particles of rarefied air	
Answer	A	
2	In Millikan's oil drop experiment, what was the consequence of making the electric gravitational force (m g)?	eal force (q E) equal to the
A	The oil drops were suspended, motionless in the chamber.	
В	The oil drops fell downward due to the force of gravity.	
C	The oil drops fell downward due to the electrical force.	
D	The oil drops were propelled upward by the electrical force.	
Answer	A	
3	The correct electronic configuration of Sodium is:	
A	2,8,1	
В	8,2,1	
C	2,1,8	
D	2,8,2	
Answer	A	
4	The atomic number of an atom is the number of in the atom's nucleus.	
A	Electrons	
В	Neutrons	
С	Protons	
D	Valence electrons	

5	Elements in the same column of the Periodic table have common in?
A	The same atomic weight
В	The same number of electrons in the outermost shell
C	The same total number of electrons
D	The same number of electron shells
Answer	В
6	The sp ³ d ² hybridization of central atom of a molecule would lead to
A	square planar geometry
В	Tetrahedral geometry
C	Trigonal bipyramidal geometry
D	Octahedral geometry
Answer	D
7	Temperature below which, the gas does not obey ideal gas laws is called
A	Boyle's temperature
В	inversion temperature
С	reduced temperature
D	critical temperature
Answer	A
8	An endothermic reaction is one, which occurs
A	With evolution of heat
В	With absorption of heat
С	In forward direction
D	No change of heat
Answer	В
0	
9	The factor E+PV is known as
A	Heat content
В	Enthalpy
С	Work done
D	Entropy
Answer	В
10	I 1 64 6.11
10	In which of the following process, a maximum increase in entropy is observed?

A	dissolution of salt in water
В	condensation of water
С	sublimation of naphthalene
D	melting of ice
Answer	C

11	An acid HA ionises as HA \Longrightarrow H ⁺ + A ⁻ The pH of 1.0 M solution is 5. Its dissociation constant would be
A	1×10^{-5}
В	1×10^{-10}
С	5
D	5×10^{-8}
Answer	В

12	Ions which are attracted towards the anode are known as
A	Anion
В	Cation
С	Radical
D	Positron
Answer	A

13	Decease of oxidation Number is known as
A	Oxidation
В	Reduction
С	Neutralization
D	Disproportionation
Answer	В

14	Hydrogen has 3 isotopes. Which of the following is NOT one of them?
A	Tritium
В	Proton
С	Deuterium
D	Protium
Answer	В

15	One of the following is not called alkaline earth metal.
A	barium
В	radium.
С	Beryllium
D	Strontium
Answer	С
16	When Cl ₂ gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from
A	Zero to -1 and zero to $+3$
В	Zero to $+ 1$ and zero to -3
C	Zero to + 1 and zero to -5
D	Zero to – 1 and zero to +5
Answer	D
17	In which of the following compounds, nitrogen exhibits highest oxidation state?
A	N_3H
В	NH ₂ OH
C	N_2H_4
D	NH ₃
Answer	A
18	An isomer of ethanol is
A	Ethanol
В	Methanol
C	Diethyl ether
D	Dimethyl ether
Answer	D
19	Which of the following can't be used in Freidal Craft's reactions?
A	FeCl ₃
В	$FeBr_3$

С

AlCl₃

D	NaCl
Answer	D

20	Write the IUPAC name of CH ₃ CH ₂ COOH
A	Ethyl formic acid
В	Ethyl carboxylic acid
C	Ethane methanoic acid
D	Propanoic acid
Answer	D

21	The rate of this reaction can be expressed in terms of time derivatives of concentration $N_2(g)$, $H_2(g)$ or $NH_3(g)$. Identify the correct relationship amongst the rate expression: $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$
A	Rate = $-\frac{d[N_2]}{dt} = -\frac{1}{3}\frac{d[H_2]}{dt} = -\frac{1}{2}\frac{d[NH_3]}{dt}$
В	Rate = $-\frac{d[N_2]}{dt}$ = $-3 \frac{d[H_2]}{dt}$ = $2 \frac{d[NH_2]}{dt}$
С	Rate = $\frac{d[N_2]}{dt} = -\frac{1}{3} \frac{d[H_2]}{dt} = \frac{1}{2} \frac{d[NH_3]}{dt}$
D	Rate = $-\frac{d[N_2]}{dt} = -\frac{d[H_2]}{dt} = \frac{d[NH_3]}{dt}$
Answer	A

22	The specific rate constant of a first order reaction depends on the
A	Concentration of the reactant
В	Concentration of the product
С	Time
D	Temperature
Answer	D

23	The unit of rate constant for the first order reaction is
A	Sec ⁻¹
В	Mol. ltr. ⁻¹

С	Mol. ⁻¹ ltr.sec ⁻¹
D	Ltr. ⁻¹
Answer	A
24	Which of the following statement is incorrect?
A	Taj Mahal is affected by hydrocarbons.
В	Buildings are adversely affected by acid rain.
С	Due to acid rain, microorganisms are affected
D	Large amount of acid rain decreases soil fertility.
Answer	A
25	Compounds with identical crystal structure and analogous chemical formula are called
A	Isomers
В	Isotones
С	Allotropes
D	Isomorphous
Answer	D
26	Sodium chloride, NaCl usually crystallizes in a face centred cubic lattice. How many ions are in contact with any single Na ⁺ ion?
A	8
В	6
C	4
D	1
Answer	В
27	Faraday's laws of electrolysis are related to the
A	Atomic number of the cation
В	Atomic number of the anion
С	Equivalent weight of the electrolyte
D	Speed of the cation
Answer	C

28	$2H^{+} + 2e^{-} + \frac{1}{2}O_{2} \rightarrow H_{2}O(1); E^{\circ} = +1.23 \text{ V}$
	$Fe^{2+} + 2e^{-} \rightarrow Fe(s), E^{\circ} = -0.44 \text{ V}$
	The half-cell reactions for rusting of iron are given above,
	ΔG° (in kJ) for the reaction is
A	-76
В	-322
C	-122
D	-176
Answer	В
29	We have three aqueous solution of NaCl labelled as A, B and C with concentrations of 0.1M, 0.01M and 0.001M respectively. The value of van't Hoff factor for these solutions will be in the order
A	iA <ib<ic< td=""></ib<ic<>
В	iA>iB>iC
C	iA=iB=iC
D	iA <ib>iC</ib>
Answer	C
20	
30	Colligative properties depends on
A	Nature of the solute particles
В	Number of solute particle
С	Physical properties of solute particle
D	Natureof solvent particle
Answer	В
31	In Freundlich adsorption isotherm, the value of 1/n is
A	1 in case of physical adsorption
В	1 in case of chemisorption
C	Between 0 and 1 in all cases
D	Between 2 and 4 in all cases
Answer	C
32	Which one of the following does not involve coagulation?
A	Peptization
В	Formation of delta regions

С	Treatment of drinking water by potash alum
D	Clotting of blood by the use of ferric chloride
Answer	A
33	Copper is extracted by method
A	self-reduction
В	carbon reduction
С	electrolytic
D	froth floatation
Answer	D
34	Within group 15, the trend in values of $\Delta_a H^o(at 298 \text{ K})$ is:
A	$N > P > A_S > Sb$
В	$N < P < A_S < Sb$
С	Bi > Sb > As > P
D	$N > P < A_S < Sb$
Answer	A
35	Bond enthalpy terms in group 16 follow which one of the following trends?
A	S-S > O-O
В	$Se-Se \ge S-S$
С	S=S>O=O
D	S-F < O-F
Answer	A
36	Which statement is correct regarding xenon fluorides (XeF ₂ , XeF ₄ and XeF ₆)
A	are all gases at 298 K
В	are all thermodynamically unstable with respect to Xe and F ₂
С	all react with water, but not at the same rate
D	all react with SiO ₂ at 298 K
Answer	C

Matching up correct formula and magnetic property; which pair is correct?

37

A	$[Zn(OH_2)_6]^{2+}$; paramagnetic
В	[Co(NH ₃) ₆] ³⁺ ; diamagnetic
С	[CoF ₆] ³⁻ ; diamagnetic
D	$[V(OH_2)_6]^{2+}$; diamagnetic
Answer	В

38	$[Cr(CN)_6]^{3-}$ is expected to be:
A	paramagnetic with $\mu_{eff} \approx 3.87~\mu_B$
В	diamagnetic
С	paramagnetic with μ_{eff} < 3.87 μ_{B}
D	paramagnetic with μ_{eff} > 3.87 μ_{B}
Answer	A

39	Which metal complex ion is expected to be subject to a Jahn-Teller distortion?
A	$[Cr(OH_2)_6]^{3+}$
В	$[Cr(NH_3)_6]^{2+}$
С	$[\operatorname{Cr}(\operatorname{CN})_6]^{3-}$
D	$[\operatorname{Cr}(bpy)_3]^{2+}$
Answer	В

40	Which one of the following has a square planar geometry? (Atomic numbers: Co = 27, Ni = 28, Fe = 26, Pt = 78)
A	$[CoCl_4]^{2-}$
В	$[FeCl_4]^{2-}$
С	$[NiCl_4]^{2-}$
D	[PtCl ₄] ²⁻
Answer	D

41	If 'n' represents total number of asymmetric carbon atoms in a compound, the possible number of optical isomers of the compound is
A	2n
В	n^2
С	$2^{\rm n}$
D	2n+2
Answer	C

42	Chlorination of ethane is carried out in presence of
A	anhydrous AlBr ₃
В	mercuric chloride
С	ultraviolet light
D	zinc chloride
Answer	С

43	Anisole can be prepared by the action of methyl iodide on sodium phenate. The reaction is called
A	Fittig's reaction
В	Williamson's reaction
С	Wurtz's reaction
D	Etard's reaction
Answer	В

44	Among the alkenes which one produces tertiary butyl alcohol on acid hydration
A	$(CH_3)_2C = CH_2$
В	$CH_3 - CH = CH - CH_3$
С	$CH_3 - CH_2 - CH = CH_2$
D	$CH_3 - CH = CH_2$
Answer	A

45	The correct order of decreasing acid strength of trichloroacetic acid (A), trifluoroacetic acid (B), acetic acid (C) and formic acid (D) is
A	A > B > C > D

В	A > C > B > D
С	B > A > D > C
D	B > D > C > A
Answer	С

46	One mole of a symmetrical alkane on ozonolysis gives two moles of an aldehyde having molecular mass of 44u. The alkene is:
A	Ethene
В	Propene
С	1-butene
D	2-butene
Answer	D

47	One strand of DNA has the following sequence of nucleotide 3' ATTCGCTAT 5' so the other strand of DNA has
A	5' TAAGCGATA 3'
В	3' TAAGCGATA 5'
С	5' GACGCGATA 3'
D	3' GACGCGATA 5'
Answer	A

48	Chitin is a
A	Polysaccharide
В	Nitrogenous polysaccharide
С	Lipoprotein
D	Protein
Answer	A

49	Of the following, which one is classified as polyester polymer?
A	Nylon-66
В	Terylene
С	Backelite
D	Melamine
Answer	В

50	Which polymers occur naturally?
A	Starch and Nylon
В	Starch and Cellulose

С	Proteins and Nylon
D	Proteins and PVC
Answer	В
51	The dimensional formula of magnetic flux is
A	$ML^{1}T^{-1}A^{-1}$
В	$ML^{1}T^{-2}A^{-1}$
С	$ML^2T^{-1}A^{-1}$
D	$ML^2T^{-2}A^{-1}$
Answer	D
52	How systematic errors are eliminated?
A	Frequent measurement
В	Replacement of instrument
С	Finding mean of reading
D	Finding variance of reading
Answer	В
53	A person can throw a ball up to a maximum height of 20 m. The maximum horizontal distance that he can throw the same ball will be
A	$20\sqrt{2}\mathrm{m}$
В	$40\sqrt{2} \text{ m}$
С	40 m
D	20 m
Answer	C
5.1	A norticle moves on a sirale with angular momentum T. If the frequency of out-time is doubted and like the
54	A particle moves on a circle with angular momentum L. If the frequency of rotation is doubled and kinetic energy is halved, the angular momentum becomes
A	$\mathbf{L}/4$
В	L/2
С	4L

D	2L
Answer	A
55	A satellite is orbiting just above the surface of aplanet of average density d with a period T. If G is the universal constant of gravitation, The quantity $T^2 d$ is equal to
A	1/G
В	3π /G
С	$4\pi^2/\ \mathrm{G}$
D	$4\pi^2 G$
Answer	В
56	The moment of Inertia of a uniform semicircular disc of mass M and radius R about a line perpendicular to the plane of the disc through the centre is
A	1/4(MR ²)
В	(MR^2)
С	$2/5(MR^2)$
D	$1/2(MR^2)$
Answer	D
57	A rocket of lift of mass 3.5×10^4 kg is launched upwards with an initial acceleration of 10m/s^2 . Then the initial thrust to rocket will be
A	$3.5 \times 10^5 \mathrm{N}$
В	$7.0 \times 10^5 \mathrm{N}$
С	$3.5 \times 10^4 \mathrm{N}$
D	$3.5 \times 10^6 \mathrm{N}$
Answer	A
58	The period of oscillation of a simple pendulum is given by T=2 $\pi\sqrt(l/g)$ where l =100cm and is know to have 1mm accuracy. The period is about 2s. The time of 100oscillations is measured by a standard solution of least count 0.1s. The properties are standard in a in

by a stopwatch of least count 0.1s. The percentage error in g is

A	0.1%
В	1%
С	0.2%
D	0.8%
Answer	С
59	A metallic wire of length 'L 'and area of cross section 'A' behaves like a spring. If Y is the Young's modulus of the rigidity, the spring constant 'k' is given by
A	YL/A
В	YA/L
С	YA/(2L)
D	2YA/L
Answer	В
60	Curie temperature is the temperature above which
A	A ferromagnetic material becomes paramagnetic
В	A paramagnetic material becomes diamagnetic
С	A ferromagnetic material becomes diamagnetic
D	A paramagnetic material becomes ferromagnetic
Answer	A
61	540 gm of ice at 0° C is mixed with 540 gm of water at 80° C. The resultant temperature of the mixture would be
A	0° C
	30° C
В	30°C
B C	80° C

62	When a certain amount of a heat is given to a gas under isothermal conditions, it will result in
A	a rise in temperature
В	external work being done
C	an increase in internal energy of the gas
D	both external work and rise in temperature

Answer	В
63	A reversible heat engine converts $1/6^{th}$ heat, which it absorbs from source into useful work. When the temperature of the sink is reduced by 62^{o} C, its efficiency is doubled. Then the temperature of the source is
A	262 K
В	172 K
С	272 K
D	372 K
Answer	D
64	Two spheres A and B of same material have radius 1 m and 4 m, and temperatures 4000 K and 2000 K respectively. Then the energy radiated by sphere A is
A	Greater than that of sphere B
В	Less than that of sphere B
C	Equal to that of sphere B
D	Two times that of sphere B
Answer	C
65	In the steady state, the temperature of an object
A	does not change with time but is different in different points on the object
В	increases with time
C	decreases with time
D	follows zeroth law of thermodynamics
Answer	A
66	Thermocouple thermometer works on the principle of
A	Peltier effect
В	Zeeman effect
C	Seebeck effect
D	Photoelectric effect
Answer	C
67	The mean free path of an inert gas increases with
A	decrease in temperature
В	increase in temperature
C	Remains constant
	Activities Constaint

oscillating bob gets suddenly unplugged. The time period of oscillation during draining A First increase and then decreases to the original value B First decrease and then increases to the original value C Remain unchanged C Continuously increases towards the saturation value Answer A 69 The ratio of speed of an object to the speed of sound is called A Reynolds number B Avogadro Number C Mach number D Fibonacci number Answer C 70 The time period of a mass suspended from a spring is T. If the spring is cut into four equal parts and the same mass is suspended from one of them, the new time period will be A T B T/4 C T/2 D 2T Answer C 71 In an adiabatic process, there is no work done B change in temperature C change in internal energy D exchange of heat Answer D 72 If surface tension of the water is 0.075 N/m, what will be the diameter of a water droplet, if the pressure inside is 0.1 N/cm² greater than the outside pressure? A 3 mm	D	increase in pressure
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the pressure inside is 0.1 N/cm ² greater than the outside pressure? A 3 mm	Answer	D
	72	If surface tension of the water is 0.075 N/m, what will be the diameter of a water droplet, if the pressure inside is 0.1 N/cm ² greater than the outside pressure?
B 6 mm	A	3 mm
	В	6 mm

C	0.3 mm
D	0.6 mm
Answer	A

73	What is the moment of inertia of a rectangular section (b= width and d=height) about an horizontal axis through base?
A	$bd^3/3$
В	$bd^2/12$
С	$b^2 d^3/6$
D	bd ³ /12
Answer	A

74	Which statement is right for conservative force vector F = Ai + Bj + Ck?
A	In rectangular components representation of any vector we have vector F = Ai + Bj + Ck
В	In rectangular components representation of any vector we have vector $F = Ax + By + Cz$
С	In rectangular components representation of any vector we have vector $F = Fx + Fy + Fz$
D	In rectangular components representation of any vector we have vector F = Fi + Fj + Fk
Answer	С

75	The mass of a rocket is 1000 kg , which is to be launched from the surface of earth $(g=10\text{m/s}^2)$ and radius of earth 6400km^3). The required energy to launch rocket in free space is
A	$6.4 \times 10^{11} \text{ J}$
В	$6.4 \times 10^{10} \text{J}$
С	$6.4x10^9 J$
D	$6.4 \times 10^8 \text{ J}$
Answer	D

76	6	A series L-C-R circuit has a resonant frequency of 2 MHz and a Q-factor of 100. Its bandwidth is
A		20 kHz

В	2kHz
C	4kHz
D	40kHz
Answer	A
77	When a capacitor is added in series in an L-C-R circuit, the impedance of the circuit will
A	decrease
В	increase
С	remain constant
D	depend on the frequency of a.c. mains
Answer	D
78	If an electrically charged particle passes through a magnetic field in a direction perpendicular to it then the
A	Direction of particle remains unchanged
В	Speed of the particle remains unchanged
С	Velocity remains unchanged
D	Acceleration remains unchanged
Answer	В
79	The energy of a proton accelerated through a potential difference of 1 volt is
A	0eV
В	2eV
C	1eV
D	3eV
Answer	С
80	The electric dipole in a uniform electric field is subjected to
A	Torque but no force
В	Force but no torque

C

D

Answer A

Neither torque nor force

Both force and torque

81	Kirchhoff' law that sum of all electric currents at a junction is zero is based on conservation of
A	energy
В	momentum
С	mass
D	charge
Answer	D
82	A length of metallic wire carrying a constant current is a first bent to form a circular loop of one turn and then bent to form a double loop of small radius. The ratio of magnetic field in the second case to that in the first case would be
A	1/4
В	1/2
C	1
D	4
Answer	D
83	The series of spectral lines in the spectrum of hydrogen atom that lies partly in the ultra violate and partly in visible region is called
A	Balmer series
В	Lyman series
C	Paschen series
D	Brackett series
Answer	A
84	Laser cooling of atoms is produced due to
A	Absorption of photons by atoms
В	Scattering of photons by atoms
C	Transfer of momentum from photons to atoms
D	Transfer of energy from photons to atoms

For which of the following material the magnetic susceptibility is nearly independent of temperature

Answer C

Ferrite

diamagnetic

paramagnetic

ferromagnetic

85

A

В

C

D

Answer B

86	The X-ray beam coming from an X-ray tube will be
A	monochromatic
В	Having all wavelength smaller than a certain wavelength
С	Having all wavelength larger than a certain wavelength
D	Having all wavelength between certain minimum and maximum wavelengths
Answer	C

87	The magnification of the image formed by a concave mirror of focal length 'f' is 'm'. If the image is real, the distance of the object from the mirror should be
A	mf
В	(m+1)f
С	f(m-1)/m
D	f(m+1)/m
Answer	D

88	The velocity of light emitted by a source as measured by a stationary observer is C. If the observer moves towards the source with a velocity V then the velocity of light measured by him would be
A	C+V
В	C
С	C-V
D	$\frac{c}{\sqrt{1-v^2/c^2}}$
Answer	В

89	In a Newton's ring experiment, the diameter of the nth dark ring changes from 1.2 cm to 1cm when the air space between the lens and place is replaced by a transparent liquid. The refractive index of liquid is
A	1.44
В	1.33
С	1.55
D	2.33
Answer	A

90	When one leg of Michelson' interferometer is lengthened by a distance, say x, 150 dark fringes sweep through the field of view. If the wavelength of light used is 480 nm, the value of x is
A	12000 nm
В	24000 nm
C	36000 nm
D	48000 nm
Answer	С
91	When a triode is used as an amplifier, the phase difference between the input signal and the output voltage is
A	π /4
В	π
С	π /2
D	2π
Answer	В
92	The radioactive of an element decreases to half of its original activity I_0 in a period of 9 years After a further period of nine years its activity will be
A	$I_0/2$
В	$I_0/3$
C	$I_{o}/4$
D	I _o /9
Answer	С
93	In a semiconductor like silicon, the unit cell is
A	Simple cubic
В	Body-centered cubic
C	hexagonal
D	Face-centered Diamond cubic
Answer	D
94	In Boolean algebra $\overline{\overline{A} \cdot \overline{B}}$ is equal to

В	$ar{A}$ + $ar{B}$
С	A. B
D	A+B
Answer	D
95	A reaction $_{48}\text{Cd}^{107} \rightarrow _{47}\text{Cd}^{107}$ may occur
A	Either by electron capture or positron emission
В	Only by electron capture
С	Only by proton emission
D	Only by electron emission
Answer	A
96	In a Ramsden's eyepiece, the focal length if eye lens is f. The distance from the eye lens at which the image due to objective is formed, is
A	f/4
В	f/2
С	2f/3
D	11/12f
Answer	D
97	A photosensitive material would emit electrons, if excited by photons beyond a threshold. To overcome the threshold, one would increase
A	Voltage applied to the light source
В	Intensity of light
С	Wavelength of light
D	Frequency of light
Answer	D
98	It is desired to photograph the image of an object placed at a distance 2 m from the plane of mirror. The camera, which is at distance of 5.5 m from the mirror should be focused for a distance of
A	3 m
В	6 m

С	4.5m
D	7.5 m
Answer	D

99	A sound absorber attenuates the sound level by 20dB. The intensity decreases by a factor of
A	10
В	10^2
С	10^3
D	10^4
Answer	В

100	A 20 cm long capillary tube is merged in water. The water rises up to 8 cm. If the entire arrangement is put in a freely falling elevator, the length of water column in the capillary tube will be
A	20 cm
В	12 cm
С	16 cm
D	8 cm
Answer	A