#### **COMMON ENTRANCE TEST - 2007**

DATE	SUBJECT	TIME
09 - 05 - 2007	PHYSICS & CHEMISTRY	10.00 AM to 12.30 PM
	(COMBINED PAPER)	

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
120	150 MINUTES	140 MINUTES

CET NUMBER	VERSION CODE	SERIAL NUMBER 370241
	A - 1	370241

#### IMPORTANT INSTRUCTIONS TO CANDIDATES

(Candidates are advised to read the following instructions carefully, before answering on OMR answer sheet.)

- 1. Ensure that you have entered your Name and Register Number of  $2^{nd}$  PUC Annual Examination /  $12^{th}$  Std. in the space provided on the OMR answer sheet.
- 2. Ensure that CET No. has been entered and shaded the respective circles on the OMR answer sheet.
- 3. ENSURE THAT THE TIMING, MARKS PRINTED ON THE OMR ANSWER SHEET ARE NOT DAMAGED/MUTILATED/SPOILED.
- 4. This Question Booklet is issued to you by the invigilator after the 2<sup>nd</sup> Bell. i.e., after 10.00 a.m.
- 5. Enter the Serial Number of this question booklet on the OMR answer sheet.
- 6. Carefully enter the Version Code of this question booklet on the OMR answer sheet and SHADE the respective circles completely.
- 7. As answer sheets are designed to suit the Optical Mark Reader (OMR) system, please take special care while filling and shading the CET NO. & Version Code of this question booklet.
- 8. DO NOT FORGET TO SIGN AT THE BOTTOM PORTION OF OMR ANSWER SHEET IN THE SPACE PROVIDED.
- 9. Until the 3<sup>rd</sup> Bell is rung at 10.10 a.m.:
  - Do not remove the seal present on the right hand side of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.
- 10. After the 3<sup>rd</sup> Bell is rung at 10.10 a.m., remove the seal present on the right hand side of this question booklet and start answering on the OMR answer sheet.
- 11. This question booklet contains 120 questions and each question will have four different options / choices.
- 12. During the subsequent 140 minutes:
  - Read each question carefully.
  - Determine the correct answer from out of the four available options / choices given under each question.
  - Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALLPOINT PEN against the question number on the OMR answer sheet.

### CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW:



- 13. Please note that even a minute unintended ink dot on the OMR sheet will also be recognised and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
- 14. Use the space provided on each page of the question booklet for Rough work AND do not use the OMR answer sheet for the same.
- 15. After the last bell is rung at 12.30 p.m., stop writing on the OMR answer sheet and affix your LEFT HAND THUMB IMPRESSION on the OMR answer sheet as per the instructions.
- 16. Hand over the OMR ANSWER SHEET to the room invigilator as it is.
- 17. After separating and retaining the top sheet (CET Cell Copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
- 18. Preserve the replica of the OMR answer sheet for a minimum period of One year.





## PHYSICS

A ray of light is travelling from glass to air. (Refractive index of glass = 1.5) The angle of 1. incidence is 50°. The deviation of the ray is

1) 
$$Sin^{-1} \left[ \frac{Sin \, 50^0}{1.5} \right] - 50^0$$

2) 
$$50^0 - Sin^{-1} \left[ \frac{Sin50^0}{1.5} \right]$$

 $3) 80^0$ 

4)

A vessel of height 2 d is half filled with a liquid of refractive index  $\sqrt{2}$  and the other half 2. with a liquid of refractive index n. (The given liquids are immiscible). Then the apparent depth of the inner surface of the bottom of the vessel (neglecting the thickness of the bottom of the vessel) will be

$$1) \quad \frac{nd}{d + \sqrt{2n}}$$

2) 
$$\frac{\sqrt{2n}}{d(n+\sqrt{2})}$$
4) 
$$\frac{n}{d(n+\sqrt{2})}$$

$$3) \quad \frac{d\left(n+\sqrt{2}\right)}{n\sqrt{2}}$$

4) 
$$\frac{n}{d(n+\sqrt{2})}$$

- 3. A ray of light is incident normally on one face of a right angled isosceles prism. It then grazes the hypotenuse. The refractive index of the material of the prism is
  - 1) 1.732

2) 1.5

3) 1.414

- 1.33 4)
- 4. Two thin equiconvex lenses each of focal length 0.2 m are placed coaxially with their optic centres 0.5 m apart. Then the focal length of the combination is
  - 1) 0.1 m

 $2) - 0.1 \,\mathrm{m}$ 

3) 0.4 m

- 4) 0.4 m
- 5. A prism of a certain angle deviates the red and blue rays by 80 and 120 respectively. Another prism of the same angle deviates the red and blue rays by 10° and 14° respectively. The prisms are small angled and made of different materials. The dispersive powers of the materials of the prisms are in the ratio
  - 1) 11:9

2) 6:5

3) 9:11

4) 5:6

The electro magnetic theory of light failed to explain

	1)	Interference	2)	Diffraction
	· .	Polarisation	4)	Photo electric effect
7.	the scree	om two coherent sources of the en. The intensity of the central y at the same point will be	e same ai maximu	mplitude $A$ and wavelength $\lambda$ illuminates m is $I_0$ . If the sources were incoherent, the
	1)	$\frac{I_0}{2}$		$I_0$
	3)	$2I_0$	4)	$4I_0$
8.	In Youn slits 0.5	g's double slit experiment with 89 mm apart, the half angular	sodium v	vapour lamp of wavelength 589 nm and the the central maximum is
•		$Sin^{-1}0.1$		$Sin^{-1}0.001$
	3)	$Sin^{-1}0.0001$	4)	$Sin^{-1}0.01$
9.	A single	slit Fraunhoffer diffraction pat	tern is fo	rmed with white light. For what wavelength
	of light	the third secondary maximum	in the d	iffraction pattern coincides with the second
	seconda	ry maximum in the pattern fo	r red ligh	nt of wavelength $6500 \stackrel{0}{A}$ ?
	1)	9100A	2)	$^{0}_{4642.8A}$
	3)	$^0_{4100A}$	4)	$4400 \overset{0}{A}$
10.	The he	ad lights of a jeep are 1.2 m	apart. If	the pupil of the eye of an observer has a
	diamete	er of 2 mm and light of wavele	ngth 589	$\overset{0}{6A}$ is used, what should be the maximum
	distanc	e of the jeep from the observer	if the tv	vo head lights are just separated?
	1)			3.39 km
	3)	) 33.9 m	4)	33.9 km

(Space for Rough Work)

6.

11.	When the angle of incidence is 60° on the surface of a glass slab, it is found that the r	eflected
	ray is completely polarised. The velocity of light in glass is	

1) 
$$3 \times 10^8 \, \text{ms}^{-1}$$

2) 
$$2 \times 10^8 \,\mathrm{ms}^{-1}$$

3) 
$$\sqrt{3} \times 10^8 \,\mathrm{ms}^{-1}$$

4) 
$$\sqrt{2} \times 10^8 \,\mathrm{ms}^{-1}$$

12. A 20 cm length of a certain solution causes right handed rotation of 38°. A 30 cm length of another solution causes left handed rotation of 24°. The optical rotation caused by 30 cm length of a mixture of the above solutions in the volume ratio 1:2 is

- 1) right handed rotation of 30
- 2) left handed rotation of 30
- 3) right handed rotation of 140
- 4) left handed rotation of 140

13. Two identical charges repel each other with a force equal to 10 mgwt when they are 0.6 m apart in air.( $g = 10 \text{ ms}^{-2}$ ) The value of each charge is

1)  $2\mu C$ 

2) 2nC

3)  $2 \times 10^{-7} C$ 

4) 2mC

14. The potential of the electric field produced by a point charge at any point (x, y, z) is given by  $V = 3x^2 + 5$ , where x, y, z are in metres and V is in volts. The intensity of the electric field at (-2, 1, 0) is

1)  $-12Vm^{-1}$ 

2)  $+12Vm^{-1}$ 

3)  $-17Vm^{-1}$ 

4)  $+17Vm^{-1}$ 

15. The potential of a large liquid drop when eight liquid drops are combined is 20V. Then the pontential of each single drop was

1) 2.5 V

2) 5 V

3) 7.5 V

4) 10 V

- 16. Two indentical capacitors each of capacitance  $5\mu F$  are charged to potentials 2 kV and 1 kV respectively. The –ve ends are connected together. When the +ve ends are also connected together, the loss of energy of the system is
  - 1) 1.25 J

2) 5 J

3) 0 J

- 4) 160 J
- 17. A parallel plate capacitor with air as the dielectric has capacitance C. A slab of dielectric constant K and having the same thickness as the separation between the plates is introduced so as to fill one-fourth of the capacitor as shown in the figure. The new capacitance will be



1)  $\frac{KC}{4}$ 

 $2) \quad (K+1)\frac{C}{4}$ 

3)  $(K+2)\frac{C}{4}$ 

- 4)  $(K+3)\frac{C}{4}$
- 18. A current of 5 A is passing through a metallic wire of cross-sectional area  $4 \times 10^{-6} \,\mathrm{m}^2$ . If the density of charge carriers of the wire is  $5 \times 10^{26} \,\mathrm{m}^{-3}$ , the drift velocity of the electrons will be
  - 1)  $1 \times 10^{-2} \text{ms}^{-1}$

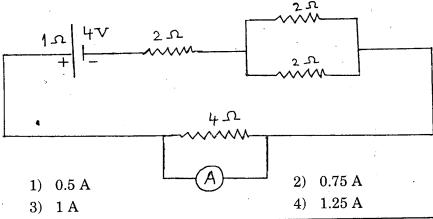
2)  $1.56 \times 10^{-3} \,\mathrm{ms}^{-1}$ 

3)  $1.56 \times 10^{-2} \text{ms}^{-1}$ 

- 4)  $1 \times 10^2 \text{ms}^{-1}$
- 19. Two bulbs rated 25 W 220 V and 100 W 220 V are connected in series to a 440 V supply. Then,
  - 1) both the bulbs fuse
- 2) neither of the bulbs fuses

3) 25 W bulb fuses

- 4) 100 W bulb fuses
- 20. The current passing through the ideal ammeter in the circuit given below is



21. In the Wheatstone's network given below,

$$P = 10 \Omega$$

$$Q = 20 \Omega$$

$$R = 15 \Omega$$
,

$$S = 30\Omega$$

The current passing through the battery (of negligible internal resistance) is



2) 0.18 A

Q

4) 0.36 A

**22.** A circular coil carrying a certain current produces a magnetic field *Bo* at its centre. The coil is now rewound so as to have 3 turns and the same current is passed through it. The new magnetic field at the centre is

$$2) \quad \frac{B_0}{3}$$

4) 
$$\frac{Bc}{9}$$

23. A proton and a deuteron with the same initial kinetic energy enter a magnetic field in a direction perpendicular to the direction of the field. The ratio of the radii of the circular trajectories described by them is

3) 
$$1:\sqrt{2}$$

24. Two tangent galvanometers A and B have coils of radii 8 cm and 16 cm respectively and resistance  $8\Omega$  each. They are connected in parallel with a cell of emf 4 V and negligible internal resistance. The deflections produced in the T.G's A and B are  $30^{\circ}$  and  $60^{\circ}$  respectively. If A has 2 turns, then B must have

- 4) 18 turns
- 25. A charged particle is moving in a magnetic field of strength B perpendicular to the direction of the field. If q and m denote the charge and mass of the particle respectively. Then the frequency of rotation of the particle is

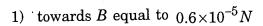
$$1) \quad f = \frac{2\pi m}{qB}$$

$$2) \quad f = \frac{2\pi^2 m}{qB}$$

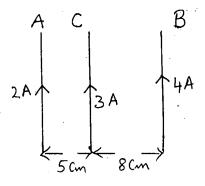
$$3) \quad f = \frac{qB}{2\pi m^2}$$

$$f = \frac{qB}{2\pi m}$$

**26.** A and B are two infinitely long straight parallel conductors. C is another straight conductor of length 1 m kept parallel to A and B as shown in the figure. Then the force experienced by C is



- 2) towards A equal to  $5.4 \times 10^{-5} N$
- 3) towards B equal to  $5.4 \times 10^{-5} N$
- 4) towards A equal to  $0.6 \times 10^{-5} N$



27. An electric bulb has a rated power of 50 W at 100 V. If it is used on an a.c. source 200 V, 50Hz, a choke has to be used in series with it. This choke should have an inductance of

1) 1.1 H

2) 0.1 H

3) 1 mH

4) 0.1 mH

28. An inductance of  $\frac{200}{\pi}$  mH, a capacitance of  $\frac{10^{-3}}{\pi}$ F and a resistance of  $10\Omega$  are connected in series with an a.c. source 220 V, 50Hz. The phase angle of the circuit is

1)  $\frac{\pi}{3}$ 

 $2) \quad \frac{\pi}{2}$ 

3)  $\frac{\pi}{4}$ 

4)  $\frac{\pi}{6}$ 

29. A stepdown transformer reduces the voltage of a transmission line from 2200 V to 220 V. The power delivered by it is 880 W and its efficiency is 88%. The input current is

1) 4.65 A

2) 0.465 A

3) 0.0465 A

(4) 4.65 mA

**30.** Current in a coil changes from 4 A to zero in 0.1 second and the emf induced is 100 V. The self inductance of the coil is

1) 4 H

2) 2.5 H

3) 0.4 H

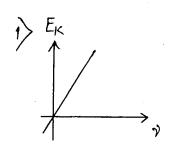
4) 0.25 H

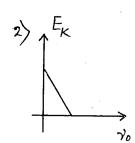
- 31. All components of the electromagnetic spectrum in vacuum have the same
  - 1) Frequency

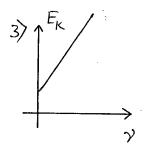
2) Wavelength

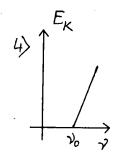
3) Velocity

- 4) Energy
- 32. Which one of the following graphs represents the variation of maximum kinetic energy  $(E_K)$  of the emitted electrons with frequency  $\gamma$  in photoelectric effect correctly?









- 1) 1
- 3) 3

- 2) 2
- 4) 4
- 33. A and B are two metals with threshold frequencies  $1.8\times10^{14}\,\mathrm{Hz}$  and  $2.2\times10^{14}\,\mathrm{Hz}$ . Two identical photons of energy 0.825 eV each are incident on them. Then photoelectrons are emitted in
  - 1) A alone

2) B alone

3) in both A and B

4) in neither A nor B

(Take  $h = 6.6 \times 10^{-34} \text{ Js}$ )

- **34.** The ionization energy of  $L_i^{++}$  is equal to
  - 1) hcR

2) 2 hcR

3) 6 hcR

- 4) 9 hcR
- **35.** Electrons in a certain energy level n = n, can emit 3 spectral lines. When they are in another energy level  $n = n_2$ . They can emit 6 spectral lines. The orbital speeds of the electrons in the two orbits are in the ratio
  - 1) 1:2

2) 2:1

3) 3:4

4) 4:3

- 36. The deBroglie wavelength of a proton (charge =  $1.6 \times 10^{-19} C$ , mass =  $1.6 \times 10^{-27} kg$ ) accelerated through a p.d of 1 kV is
  - 1) 0.9 nm

2)  $7A^{0}$ 

3)  $0.9 \times 10^{-12} \text{ m}$ 

- 4)  $600 \stackrel{0}{A}$
- 37. A radio active element forms its own isotope after 3 consecutive disintegrations. The particles emitted are
  - 1)  $2\alpha$  particles and  $1\beta$  particle
- 2)  $2\beta$  particles and  $1\gamma$  particle
- 3)  $2\beta$  particles and  $1\alpha$  particle
- 4)  $3\beta$  particles
- **38.** A radio active substance contains 10,000 nuclei and its half life period is 20 days. The number of nuclei present at the end of 10 days is
  - 1) 7,500

2) 8,000

3) 9,000

- 4) 7,070
- 39. In Raman effect, Stokes' lines are spectral lines having
  - 1) wavelength greater than that of the original line.
  - 2) wavelength less than that of the original line.
  - 3) wavelength equal to that of the original line.
  - 4) frequency greater than that of the original line.
- 40. The principle of LASER action involves
  - 1) Stimulated emission
  - 2) Population inversion
  - 3) Amplification of particular frequency emitted by the system
  - 4) All of these

41. The volume of a nucleus is directly proportional to ........

1)  $A^{\frac{1}{3}}$ 

2)  $\sqrt{A}$ 

3)  $A^3$ 

4) A

(Where A = mass number of the nucleus)

42. An electron is

1) A lepton

2) A nucleon

3) Baryon

4) Hadron

43. Minority carriers in a p-type semiconductor are

1) Holes

- 2) Free electrons
- 3) Both holes and free electrons
- 4) Neither holes nor free electrons

44. In a reverse biased diode when the applied voltage changes by 1 V, the current is found to change by  $0.5\,\mu A$ . The reverse bias resistance of the diode is

1)  $2\Omega$ 

2)  $200\Omega$ 

3)  $2\times10^6\,\Omega$ 

4)  $2\times10^5\,\Omega$ 

45. The truth table given below is for

B	Y
. 0	1
1	1
0	1
1	0
	0 1 0

(A and B are the inputs, Y is the output)

1) NAND

2) XOR

3) AND

4) NOR

- 46. The dimensional formula for impulse is
  - 1)  $ML^{-1}T^{-1}$

2)  $M^{-1}LT^{-1}$ 

3)  $ML^{-1}T$ 

- 4)  $MLT^{-1}$
- 47. The maximum height attained by a projectile when thrown at an angle  $\theta$  with the horizontal is found to be half the horizontal range. Then  $\theta$  =
  - 1)  $Tan^{-1}\frac{1}{2}$

 $2) \frac{\pi}{4}$ 

3)  $\frac{\pi}{6}$ 

- 4)  $Tan^{-1}2$
- 48. A shell of mass 20 kg at rest explodes into two fragments whose masses are in the ratio 2:3. The smaller fragment moves with a velocity of 6 ms<sup>-1</sup>. The kinetic energy of the larger fragment is
  - 1) 360 J

2) 144 J

3) 216 J

- 4) 96 J
- 49. Water rises in plant fibres due to
  - 1) Osmosis

2) Fluid pressure

3) Viscosity

- 4) Capillarity
- **50.** The acceleration due to gravity becomes  $\left(\frac{g}{2}\right)$  where g = acceleration due to gravity on the surface of the earth at a height equal to
  - 1)  $\frac{R}{2}$

2) 2*R* 

3)  $\frac{R}{4}$ 

4) 4*R* 

- 51. The cylindrical tube of a spray pump has a cross-section of 8 cm<sup>2</sup>, one end of which has 40 fine holes each of area 10<sup>-8</sup> m<sup>2</sup>. If the liquid flows inside the tube with a speed of 0.15 m.min<sup>-1</sup>, the speed with which the liquid is ejected through the holes is
  - 1)  $0.5 \text{ ms}^{-1}$

 $2) 0.05 \text{ ms}^{-1}$ 

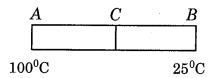
3)  $5 \text{ ms}^{-1}$ 

- 4)  $50 \text{ ms}^{-1}$
- 52. During an adiabatic process, the cube of the pressure is found to be inversely proportional to the fourth power of the volume. Then the ratio of specific heats is
  - 1) 1.4

2) 1.67

3) 1.33

- 4) 1
- **53.** Two identical rods AC and CB made of two different metals having thermal conductivities in the ratio 2: 3 are kept in contact with each other at the end C as shown in the figure. A is at  $100^{\circ}$ C and B is at  $25^{\circ}$ C. Then the junction C is at



1)  $50^{\circ}$ C

2)  $75^{\circ}$ C

 $3) 60^{0}$ C

- 4)  $55^{\circ}$ C
- 54. 310 J of heat is required to raise the temperature of 2 moles of an ideal gas at constant pressure from 25°C to 35°C. The amount of heat required to raise the temperature of the gas through the same range at constant volume is
  - 1) 452 J

2) 276 J

3) 144 J

- 4) 384 J
- 55. A Carnot's engine operates with source at 127°C and sink at 27°C. If the source supplies 40 kJ of heat energy, the work done by the engine is
  - 1) 1 kJ

2) 4 kJ

3) 10 kJ

4) 30 kJ

- 56. The maximum particle velocity in a wavemotion is half the wave velocity. Then the amplitude of the wave is equal to
  - 1) λ

 $2) \quad \frac{\lambda}{2\pi}$ 

3)  $\frac{2\lambda}{\pi}$ 

- 4)  $\frac{\lambda}{4\pi}$
- 57. The ratio of the velocity of sound in hydrogen  $\left(r = \frac{7}{5}\right)$  to that in helium  $\left(r = \frac{5}{3}\right)$  at the same temperature is
  - $1) \quad \frac{\sqrt{21}}{5}$

 $2) \quad \frac{\sqrt{42}}{5}$ 

 $3) \quad \sqrt{\frac{5}{21}}$ 

- $4) \quad \sqrt{\frac{5}{42}}$
- 58. An engine is moving towards a wall with a velocity 50 ms<sup>-1</sup> emits a note of 1.2 kHz. Speed of sound in air = 350 ms<sup>-1</sup>. The frequency of the note after reflection from the wall as heard by the driver of the engine is
  - 1) 1.2 kHz

2) 1.6 kHz

3) 0.24 kHz

- 4) 2.4 kHz
- 59. A glass tube is open at both the ends. A tuning fork of frequency f resonates with the air column inside the tube. Now the tube is placed vertically inside water so that half the length of the tube is filled with water. Now the air column inside the tube is in unison with another fork of frequency f'. Then
  - $1) \quad f' = \frac{f}{2}$

2) f' = 2f

3) f' = 4f

- 4) f'=f
- **60.** The surface temperature of the Sun which has maximum energy emission at 500 nm is 6000 K. The temperature of a star which has maximum energy emission at 400 nm will be
  - 1) 6500 K

2) 7500 K

3) 4500 K

4) 8500 K

16 A-1

A - 1

# CHEMISTRY

18

**A - 1** 

61. During the extraction of gold the following reactions take place -

$$Au + CN^{-} + H_{2}O \xrightarrow{O_{2}} [X]$$
$$[X] + Zn \xrightarrow{} [Y] + Au$$

5 . j.

X and Y are respectively -

1) 
$$\left[Au\left(CN\right)_{2}\right]^{-}$$
 and  $\left[Zn\left(CN\right)_{4}\right]^{2-}$  2)  $\left[Au\left(CN\right)_{4}\right]^{3-}$  and  $\left[Zn\left(CN\right)_{4}\right]^{2-}$ 

3) 
$$\left[Au\left(CN\right)_{4}\right]^{2-}$$
 and  $\left[Zn\left(CN\right)_{4}\right]^{2-}$  4)  $\left[Au\left(CN\right)_{2}\right]^{-}$  and  $\left[Zn\left(CN\right)_{6}\right]^{4-}$ 

- 62. The number of gram molecules of chlorine in  $6.02 \times 10^{25}$  hydrogen chloride molecules is
  - 1) 5

2) 50

3) 100

- 4) 10
- **63.** Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that graphite
  - 1) has molecules of variable molecular masses like polymers.
  - 2) has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds.
  - 3) is a non-crystalline substance.
  - 4) is an allotropic form of carbon.
- 64. Paracetamol is a / an
  - 1) antimalarial

2) antipyretic

3) analgesic

- 4) both 2 and 3
- 65. Which one of the following has maximum number of atoms of oxygen?
  - 1) 2 g of water

- 2) 2 g of sulphur dioxide
- 3) 2 g of carbon dioxide
- 4) 2 g of carbon monoxide.

00.	which	one of the following show	vs functional i	somerism ?		
	1)	$CH_2Cl_2$	2)	$C_2H_5OH$		
	3)	$C_3H_6$	4)	$C_2H_4$		•
67.	In the ic	onic equation $-BiO_3^-+6$	$H^+ + Xe^-$	$\rightarrow Bi^{3+} + 3H_2O$ ,		
	the valu	es of $X$ is $-$		–		
	1)	3	2)	4		
	3)	2	4)	6		•
<b>68.</b>	Molarity	of a given orthophospho	oric acid solut	ion is 3M. It's noi	cmality is –	
	1)	1 N	2)	3 N	T	
	3)	0.3 N	4)	9 N		
69.	Acidified colourati	l sodium fusion extract on which confirms the p	on addition o presence of –	f ferric chloride s	solution gives bloo	d red
	1)	S	2)	N		-
	3)	N and $S$	4)	S and $Cl$		
70.		f mass 10 mg is moving v sociated with it would be		of $100 \text{ ms}^{-1}$ . The	wavelength of de-B	roglie
	(Note: h	$=6.63\times10^{-34} \text{Js}$ )			•	
	1)	$6.63 \times 10^{-37} \text{m}$	2)	$6.63 \times 10^{-31}$ m		
	3)	$6.63 \times 10^{-34}$ m	4)	$6.63 \times 10^{-35}$ m	•	

71. $Mg^{2+}$ is isoelectronic w	$M \sigma^{2+}$	is	isoelectronic	with
----------------------------------	-----------------	----	---------------	------

1)  $Ca^{2+}$ 

2)  $Na^{-1}$ 

3)  $Zn^{2+}$ 

4)  $Cu^{2+}$ 

## 72. Gram molecular volume of oxygen at STP is -

1) 11200 cm<sup>3</sup>

2) 22400 cm<sup>3</sup>

 $3) 5600 \text{ cm}^3$ 

4)  $3200 \text{ cm}^3$ 

## 73. Presence of halogen in organic compounds can be detected using -

1) Beilstien's test

2) kjeldahl test

3) Duma's test

4) Leibig's test

**74.** The electronic configuration of 
$$Cr^{3+}$$
 is

1)  $[Ar]3d^54s^1$ 

 $2) \quad [Ar] 3d^2 4s^1$ 

3)  $[Ar]3d^34s^0$ 

4)  $[Ar]3d^44s^2$ 

75. The mass of a metal, with equivalent mass 31.75, which would combine with 8 g of oxygen is

1) 31.75

2) 3.175

3) 8

4) 1

1)	$C_6H_5Cl$ $C_6H_6Cl_6$ eriodic table metals usually used s - block $d$ - block	4) l as ca	atalysts belong to	,
In the p	eriodic table metals usually used s - block	l as ca	atalysts belong to	,
1)	s - block			
		2)	m blook	
3)	d - block		p - block	
	W NICOIL	4)	f - block	
Dalton's	law of partial pressures is appli	cable	to which one of the following syst	ems S
1)	$CO+H_2$	2)	$H_2 + Cl_2$	•
3)	$NO + O_2$	4)	$NH_3 + HCl$	
The gen	eral formula of a cycloalkane is			
1)	$C_nH_{2n+2}$	2)	$C_nH_{2n-2}$	
3)	$C_nH_{2n}$	4)	$C_nH_n$	
In acety	lene molecule, between the carbo	n ato	oms there are –	
1)	three sigma bonds	2)	two sigma and one pi bonds	
3)	one sigma and two pi bonds	4)	three pi bonds	
	(Space for F	lough	Work)	
	Dalton's  1) 3) The gen 1) 3) In acety 1)	1) $CO + H_2$ 3) $NO + O_2$ The general formula of a cycloalkane is 1) $C_nH_{2n+2}$ 3) $C_nH_{2n}$ In acetylene molecule, between the carbo 1) three sigma bonds 3) one sigma and two pi bonds	Dalton's law of partial pressures is applicable  1) $CO + H_2$ 2)  3) $NO + O_2$ 4)  The general formula of a cycloalkane is  1) $C_nH_{2n+2}$ 2)  3) $C_nH_{2n}$ 4)  In acetylene molecule, between the carbon atom 1) three sigma bonds 2)  3) one sigma and two pi bonds 4)	Dalton's law of partial pressures is applicable to which one of the following system:  1) $CO + H_2$ 2) $H_2 + Cl_2$ 3) $NO + O_2$ 4) $NH_3 + HCl$ The general formula of a cycloalkane is 1) $C_nH_{2n+2}$ 2) $C_nH_{2n-2}$ 3) $C_nH_{2n}$ 4) $C_nH_n$ In acetylene molecule, between the carbon atoms there are $-$ 1) three sigma bonds 2) two sigma and one pi bonds

ni. Deliaulieu alconor	atured	81.	d alcohol	is
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- 1) Rectified spirit
- 2) Undistilled ethanol
- 3) Rectified spirit + methanol + naphtha
- 4) Ethanol + methanol

#### 82. During the formation of a chemical bond

- 1) energy decreases
- 2) energy increases
- 3) energy of the system does not change
- 4) electron-electron repulsion becomes more than the nucleus-electron attraction
- 83. One mole of oxygen at 273 k and one mole of sulphur dioxide at 546 k are taken in two separate containers, then,
  - 1) kinetic energy of  $O_2$  > kinetic energy of  $SO_2$ .
  - 2) kinetic energy of  $O_2$  < kinetic energy of  $SO_2$ .
  - 3) kinetic energy of both are equal.
  - 4) None of these

#### 84. +I effect is shown by

 $1) -NO_2$ 

2) *-Cl* 

3) -Br

4) -CH<sub>3</sub>

### 85. Formation of coloured solution is possible when metal ion in the compound contains

1) paired electrons

- 2) unpaired electrons
- 3) lone pair of electrons
- 4) none of these

86.	wnich o	i the following is an intensive p	ropert	у:
	1)	temperature	2)	surface tension
	3)	viscosity	4)	all of these
87.	Hofman	n's bromamide reaction is to con	vert	
	1)	amine to amide	2)	amide to amine
	3)	alcohol to acid	4)	acid to alcohol
88.	IUPAC :	name of $Na_3igl[{\it Co(NO_2)}_6igr]$ is		
	1)	sodium cobaltinitrite	2)	sodium hexanitrito cobaltate (III)
	3)	sodium hexanitro cobalt (III)	4)	sodium hexanitrito cobaltate (II)
89.	Thermo	dynamic standard conditions of	tempe	rature and pressure are
	1)	$0^0$ C and 1 atm	2)	273 k and 101.3 k Pa
	3)	298 k and 1 atm	4)	$0^0$ C and $101.3$ k Pa
90.	How ma	ny chiral carbon atoms are prese	ent in	2, 3, 4 - trichloropentane?
	1)	3	2)	2
	3)	1	4)	4
		· · · · · · · · · · · · · · · · · · ·	-	

- 91. The number of unidentate ligands in the complex ion is called
  - 1) EAN

2) Coordination number

3) primary valency

- 4) oxidation number
- **92.**  $2SO_{2(g)} + O_{2(g)} \xrightarrow{V_2O_5}$  is an example for
  - 1) irreversible reaction
- 2) heterogenous catalysis
- 3) homogenous catalysis
- 4) neutralisation reaction
- 93. The amino acid which is not optically active is
  - 1) glycine

2) alanine

3) serine

- 4) lactic acid
- **94.** For a stable molecule the value of bond order must be
  - 1) negative
  - 2) positive
  - 3) zero
  - 4) there is no relationship between stability and bond order.
- 95. Which one of the following is a second order reaction?
  - 1)  $CH_3COOCH_3 + NaOH \longrightarrow CH_3COONa + H_2O$
  - 2)  $H_2 + Cl_2 \xrightarrow{\text{sunlight}} 2HCl$
  - 3)  $NH_4NO_3 \longrightarrow N_2 + 3H_2O$
  - 4)  $H_2 + Br_2 \longrightarrow 2HBr$

96.	Accordin	ng to Bayer's strain theory which	is hi	ghly stable?	
	1)	cyclohexane	2)	cycloheptane	
	3)	cyclopentane	4)	cyclobutane	
97.	The nun	nber of antibonding electron pairs	$\sin O_2^2$	2– molecular ion on the bas	is of molecular
	orbital t	heory is			
	[Note - A	Atomic number of O is 18]	•		
	1)	2	2)	3,	
	3)	4	4)	5	
98.	Hydroxy	rl ion concentration of 1M $HCl$ is	5		
	1)	$1\times10^{-14}\mathrm{mol}\;\mathrm{dm}^{-3}$	2)	$1\times10^{-1}$ mol dm <sup>-3</sup>	
	. 3)	$1\times10^{-13}\mathrm{mol}\;\mathrm{dm}^{-3}$	4)	$1\times10^1\mathrm{mol\ dm}^{-3}$	. 3
99.	Geometr	rical isomerism is shown by			
	1)	-C-C-	2)	$-C \equiv C$ –	
	3)	-C - C - $C = C'$	4)	None of these	•
100.	The oxid	dation state of iron in $K_4[Fe(C)]$	$N)_6$	is	
	1)	2	. 2)	3	
	3)	4	4)	1	

101. In which of the following process, a maximum increase in entropy is observed?

- 1) dissolution of salt in water
- 2) condensation of water
- 3) sublimation of naphthalene
- 4) melting of ice

102. Decomposition of benzene diozonium chloride by using  $Cu_2Cl_2/HCl$  to form chlorobenzene is

- 1) Cannizarro's reaction
- 2) Kolbe's reaction
- 3) Sandmeyer's reaction
- 4) Raschig's reaction

103. Which complex can not ionise in solution?

1)  $[pt(NH_3)_6]Cl_4$ 

2)  $K_2[pt(F_6)]$ 

3)  $K_4[Fe(CN)_6]$ 

4)  $\left[ CoCl_3 \left( NH_3 \right)_3 \right]$ 

104. Considering the reaction  $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + 393.5 \text{ kJ}$  the signs of  $\Delta H$ ,  $\Delta S$  and  $\Delta G$  respectively are

1) -, +, -

2) -,-,-

3) - + +

4) +, -, -

105. The product formed when hydroxylamine condenses with a carbonyl compound is called

1) hydrazone

2) hydrazine

3) oxime

4) hydrazide

106.	Which o	f the following forms a colour	rless solu	tion in aqueous medium?
	1)	$Ti^{3+}$	2)	$Sc^{3+}$
	3)	v <sup>3+</sup>	4)	$Cr^{3+}$
107.		sulphur sol is evaporated sulprmed. The sol is	ohur is ob	otained. On mixing with water sulphur sol
	1)	hydrophilic	2)	hydrophobic
	3)	reversible	4)	lyophilic
108.	An alky will be	l halide reacts with alcoholic	ammonia	in a sealed tube, the product formed
	1)	a primary amine	2)	a secondary amine
	3)	a tertiary amine	4)	a mixture of all the three
109.	When co	onc. $H_2SO_4$ is heated with $P_2$	$O_5$ , the $i$	acid is converted into
	1)	sulphur		
	2)	sulphur dioxide		
	3)	sulphur trioxide		
,	4)	a mixture of sulphur dioxide	e and sul	phur trioxide
110.	Entropy	of the universe is		
٠	1)	continuously increasing	2)	continuously decreasing
	3)	zero	4)	constant
	<u> </u>	(Space for	or Rough	Work)

		•	20		**	
111.	Which o	f the following salts o	on being dissolved	in water give	es pH > 7 at $25^{\circ}$ C ?	
	1)	$NH_4CN$	2)	$NH_4Cl$		
	3)	KNO <sub>3</sub>	4)	KCN		
112.	The reas	gent used in Clemme	nson's reduction i	is		
	1)	alc. KOH	2)	aq. KOH		٠
	3)	Zn-Hg / con. $HCl$	4)	Conc. $H_2SO_4$	ł .	
113.	When K	Br is dissolved in wa	ter, $K^+$ ions are			•
	1)	oxidised	2)	reduced	:	
	3)	hydrolysed	4)	hydrated		
114.	The nob		ed in a coconut bu	ılb at 173 <i>K</i> . 7	The gases that are not	
	1)	He and Ne	2)	Ar and $Kr$		
	3)	He and Xe	4)	Ne and Xe	·	
115.	The volu	me of $10N$ and $4NH$	${\it Cl}$ required to ma	ke 1 litre of 7	N HCl are	
	1)	0.75 litre of 10 <i>N HC</i>	l and 0.25 litre of	4N~HCl		
	2)	0.80 litre of 10 <i>N HC</i>	l and 0.20 litre of	4N~HCl		
	3)	0.60 litre of 10 <i>N HC</i>	$\it l$ and 0.40 litre of	4N~HCl		
	4)	0.50 litre of 10 <i>N HC</i>	l and 0.50 litre of	4N HCl		
			(Space for Dough	Worls)		

116.	A metal	present in insulin is	<u> </u>	Carlotte Contraction	
•	1)	copper	2)	iron	
	3)	zinc	4)	aluminium	
117.		forms two oxides which have differmains constant?	erei	nt compositions. The	equivalent mass of
	1)	carbon	2)	oxygen	
	3)	neither carbon nor oxygen	4)	both carbon and oxy	gen
118.	Maximu	m number of molecules of $CH_3I$ th	at c	an react with a molec	ule of <i>CH</i> <sub>3</sub> <i>NH</i> <sub>2</sub> are
	1)	1	2)	2	4
	3)	4	4)	3	•
119.	Ellingha	um diagram represents a graph of			
	1)	$\Delta G \operatorname{Vs} T$	2)	$\Delta G^0  \mathrm{Vs}  T$	
	3)	$\Delta S \operatorname{Vs} P$	4)	$\Delta G \operatorname{Vs} P$	
120.	Identify	the ore not containing iron			
	1)	chalcopyrites	2)	carnallite	
	3)	siderite	4)	limonite	
		(C		TTT 1\	

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