

**ATOMIC ENERGY EDUCATION SOCIETY**  
Anushaktinagar, Mumbai-400 094

**2015 – Open Candidates Examination**

Post – PGT (Chemistry)

Date – 27-09-2015

Time – 1 Hour 30 Minutes

Maximum Marks – 50

**Instructions**

1. There are 50 Multiple Choice Questions (MCQ) in this paper. Each question carries 1 mark. There will be negative marking of 0.25 per wrong answer.
2. Answer should be darkened/marked in the OMR answer sheet only.
3. Use of any electronic gadget (e.g. calculator, mobile phone, etc.) is not permitted, in the examination hall.
4. In case a candidate has not signed the Attendance Sheet or the OMR Answer Sheet is not signed by the Invigilator, it will be dealt with as a case of unfair means.
5. On completion of the test, the candidates MUST HAND OVER THE OMR ANSWER SHEET AND QUESTION PAPER TO THE INVIGILATOR in the room/hall.
6. The candidates should ensure that the OMR answer sheet is not folded or damaged.

**To be filled by the candidate**

Name of the Candidate: \_\_\_\_\_

Roll Number: \_\_\_\_\_

OMR Number: \_\_\_\_\_

**No of printed pages –7**

**2015-Open Candidates- PGT (Chemistry) – QP**

Q.1) The balancing of chemical equations is based upon the law of....

- a) Combining volumes
- b) Definite proportions
- c) Constant proportions
- d) Conservation of mass

Q.2) The vapour pressure of a liquid depends upon it's....

- a) Mass
- b) Volume
- c) Temperature
- d) Surface area

Q.3) The credit of discovering neutron goes to....

- a) Langmuir
- b) Rutherford
- c) Chadwick
- d) Roentgen

Q.4) Electromagnetic radiation with maximum wavelength is....

- a) X-ray
- b) Radio-wave
- c) Infrared
- d) Ultraviolet ray

Q.5) Number of  $\pi$  – bonds in anthracene is....

- a) 7
- b) 9
- c) 8
- d) 6

Q.6) According to VSEPR theory, the shape of water molecule is....

- a) Planar triangle
- b) Distorted tetrahedral
- c) Trigonal bipyramidal
- d) Linear

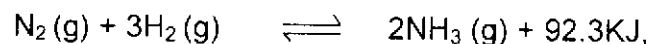
Q.7) In thermodynamics which of the following is not an intensive property?

- a) Volume
- b) Density
- c) Pressure
- d) Surface tension

Q.8) Which of the following will have maximum entropy?

- a) Ice
- b) Snow
- b) Liquid water
- d) Water vapours

Q.9) In the manufacture of ammonia by Haber's process,



Which of the following conditions is unfavourable?

- a) Removing ammonia as it is formed
- b) Increasing the temperature
- c) Increasing the pressure
- d) Decreasing the temperature

Q.10)  $\text{BF}_3$  is an acid according to....

- a) Arrhenius concept
- b) Lowry-Bronsted concept
- c) Lewis concept
- d) Henderson

Q.11) Which one of the following is the strongest acid?

- a)  $\text{SO}(\text{OH})_2$
- b)  $\text{ClO}_2(\text{OH})$
- c)  $\text{SO}_2(\text{OH})_2$
- d)  $\text{ClO}_3\text{OH}$

Q.12) A crystalline solid has a cubic structure in which tungsten (W) atoms are located at the cube corners of the unit cell, oxygen atoms at the cube edges and sodium atom at the cube centre. The molecular formula of the compound is....

- a)  $\text{NaWO}_3$
- b)  $\text{NaWO}_4$
- c)  $\text{Na}_2\text{WO}_3$
- d)  $\text{Na}_2\text{WO}_4$

Q.13) In which of the following compounds transition metal is in zero oxidation state?

- a)  $[\text{Fe}(\text{H}_2\text{O})_3](\text{OH})_2$
- b)  $[\text{Fe}(\text{H}_2\text{O})_8\text{SO}_4]$
- c)  $[\text{Ni}(\text{CO})_4]$
- d)  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_2$

Q.14) In a Galvanic cell....

- a) Chemical energy is converted in to heat
- b) Chemical energy is converted in to electricity
- c) Electrical energy is converted in to heat
- d) Electrical energy is converted in to chemical energy

Q.15) If  $^{228}\text{Th}_{90}$  disintegrates to  $^{212}\text{Bi}_{83}$ , then the number of  $\alpha$  – and  $\beta$  – particles emitted is....

- a) 4  $\alpha$  only
- b) 7  $\beta$  only
- c) 4  $\alpha$  and 7  $\beta$
- d) 4  $\alpha$  and 1  $\beta$

Q.16) Which of the following has maximum n/p ratio?

- |                    |                     |
|--------------------|---------------------|
| a) $^{16}\text{F}$ | b) $^{16}\text{Ne}$ |
| c) $^{16}\text{N}$ | d) $^{16}\text{O}$  |

Q.17) Which of the following nuclear reactions will generate an isotope?

- |                                 |                                |
|---------------------------------|--------------------------------|
| a) $\alpha$ – particle emission | b) $\beta$ – particle emission |
| c) Neutron particle emission    | d) Positron emission           |

Q.18) Smoke is an example of....

- |                            |                             |
|----------------------------|-----------------------------|
| a) Gas dispersed in liquid | b) Gas dispersed in solid   |
| c) Solid dispersed in gas  | d) Solid dispersed in solid |

Q.19) Which block 106<sup>th</sup> element belongs to?

- |            |            |
|------------|------------|
| a) s-block | b) p-block |
| c) d-block | d) f-block |

Q.20) The structure of  $\text{H}_2\text{O}_2$  is....

- |           |                |
|-----------|----------------|
| a) Planar | b) Non-planar  |
| c) Linear | d) Boat shaped |

Q.21) Which of the following is commonly used in laboratory desiccator?

- |                                       |                              |
|---------------------------------------|------------------------------|
| a) Anhydrous $\text{Na}_2\text{CO}_3$ | b) Dry $\text{CaO}$          |
| c) Dry $\text{NaCl}$                  | d) Anhydrous $\text{CaCl}_2$ |

Q.22) In India at the occasion of marriages, the fireworks give green flame. Which one of the following radicals may be present?

- |       |       |
|-------|-------|
| a) Na | b) K  |
| c) Ba | d) Ca |

Q.23)  $\text{BF}_3$  molecule has planar structure. Correct explanation for this is....

- |  |  |
|--|--|
| a) $\text{BF}_3$ is $\text{sp}^3$ hybridized | b) $\text{BF}_3$ is $\text{sp}^2$ hybridized         |
| c) $\text{BF}_3$ is $\text{sp}$ hybridized   | d) $\text{BF}_3$ is $\text{sp}^3\text{d}$ hybridized |

Q.24) Which of the following does not give a borax bead test?

- |             |                 |
|-------------|-----------------|
| a) Chromium | b) Ferrous salt |
| c) Sodium   | d) Cobalt       |

Q.25) Which of the following processes does not involve a catalyst?

- a) Contact process
- b) Haber's process
- c) Thermite process
- d) Ostwald process

Q.26) Galena is an ore of....

- a) Gallium
- b) Lead
- c) Tin
- d) Germanium

Q.27) The green house effect is caused by....

- a) CO
- b) NO<sub>2</sub>
- c) NO
- d) CO<sub>2</sub>

Q.28) Which one of the following allotropic forms of carbon is isomorphous with crystalline silicon?

- a) Graphite
- b) Coal
- c) Diamond
- d) Coke

Q.29) Which of the following formulae represents the fuming sulphuric acid?

- a) H<sub>2</sub>S<sub>2</sub>O<sub>8</sub>
- b) H<sub>2</sub>S<sub>2</sub>O<sub>7</sub>
- c) H<sub>2</sub>S<sub>2</sub>O<sub>5</sub>
- d) H<sub>2</sub>S<sub>2</sub>O<sub>4</sub>

Q.30) Crystalline form of sulphur stable at room temperature is....

- a) Rhombic sulphur
- b) Monoclinic sulphur
- c) Plastic sulphur
- d) Prismatic sulphur

Q.31) Which one of the halogen acid is a liquid?

- a) HF
- b) HCl
- c) HBr
- d) HI

Q.32) The spectrum of helium is expected to be similar to that of....

- a) H
- b) Li<sup>+</sup>
- c) Na
- d) He<sup>+</sup>

Q.33) Which of the following is a bidentate ligand?

- a) Pyridine
- b) Acetate
- c) Ethylene diamine
- d) EDTA

- Q.34) A mixture of camphor and benzoic acid can be separated by....
- a) Sublimation
  - b) Chemical methods
  - c) Fractional crystallization
  - d) Extraction with solvent
- Q.35) Cyclohexane is....
- a) Aromatic compound
  - b) Heterocyclic compound
  - c) Aliphatic compound
  - d) Alicyclic compound
- Q.36) A student named one compound as 1, 4-butadiene, which of the following is true in that case?
- a) The name is correct
  - b) He committed an error in the selection of carbon chain
  - c) He committed an error in position of double bond
  - d) He simply committed a spelling mistake
- Q.37) The IUPAC name of tert-butyl chloride is....
- a) 4-chlorobutane
  - b) 2-chlorobutane
  - c) 1-chloro-3-methyl propane
  - d) 2-chloro-2-methyl propane
- Q.38) In which of the following homolytic bond fission takes place?
- a) Addition of HBr to double bond
  - b) Photochlorination of methane
  - c) Nitration of benzene
  - d) Alkaline hydrolysis of ethyl chloride
- Q.39) The kind of delocalization involving sigma bond orbitals is called....
- a) Hyperconjugation effect
  - b) Electromeric effect
  - c) Mesomeric effect
  - d) Inductive effect
- Q.40) pH of 0.00001 M KOH is
- a) 5
  - b) 8
  - c) 9
  - d) 7
- Q.41) Tautomerism is exhibited by....
- a)  $(\text{CH}_3)_3\text{CNO}$
  - b)  $(\text{CH}_3)_2\text{NH}$
  - c)  $\text{R}_3\text{CNO}_2$
  - d)  $\text{R-CH}_2\text{NO}_2$

Q.42) Maleic and fumaric acids are....

- a) Geometrical isomers
- b) Chain isomers
- c) Functional isomers
- d) Tautomers

Q.43) The least energetic conformation of cyclohexane is....

- a) Boat form
- b) Half chair form
- c) Chair form
- d) Twisted form

Q.44) Marsh gas mainly contains....

- a)  $C_2H_2$
- b)  $CH_4$
- c)  $H_2S$
- d)  $CO$

Q.45) In nitration mixture, concentrated sulphuric acid is used....

- a) As a solvent
- b) As sulphonating agent
- c) As dehydrating agent
- d) For the formation of nitronium ions

Q.46) Which of the following do not form Grignard reagent?

- a)  $CH_3F$
- b)  $CH_3Cl$
- c)  $CH_3Br$
- d)  $CH_3I$

Q.47) An ether is more volatile than an alcohol having the same molecular formula. This is due to....

- a) Dipolar character of ethers
- b) Alcohols having resonance structure
- c) Intermolecular hydrogen bonding in ethers
- d) Intermolecular hydrogen bonding in alcohols

Q.48) Silver mirror is a test for....

- a) Aldehydes
- b) Acids
- c) Ethers
- d) Thioalcohols

Q.49) Tomatoes contain....

- a) Lactic acid
- b) Oxalic acid
- c) Ascorbic acid
- d) Tartaric acid

Q.50) Aspirin is....

- a) Acetyl salicylic acid
- b) Phenyl salicylic acid
- c) Salicylic acid
- d) Benzoic acid

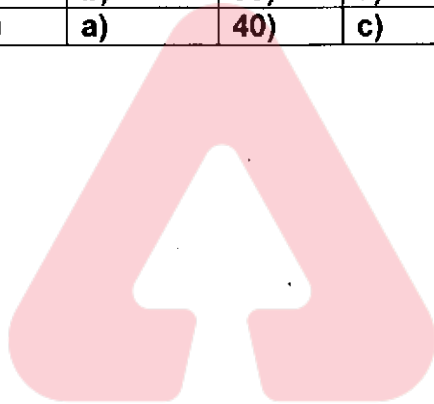
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PGT chemistry

Answer Key:

Sr. No.	Correct Response	Sr. No.	Correct Response	Sr. No.	Correct Response	Sr. No.	Correct Response	Sr. No.	Correct Response
1)	d)	11)	d)	21)	d)	31)	a)	41)	d)
2)	c)	12)	a)	22)	c)	32)	b)	42)	a)
3)	c)	13)	c)	23)	b)	33)	c)	43)	c)
4)	b)	14)	b)	24)	c)	34)	b)	44)	b)
5)	a)	15)	d)	25)	c)	35)	d)	45)	d)
6)	b)	16)	c)	26)	b)	36)	c)	46)	a)
7)	a)	17)	c)	27)	d)	37)	d)	47)	d)
8)	d)	18)	b)	28)	c)	38)	b)	48)	a)
9)	b)	19)	c)	29)	b)	39)	a)	49)	b)
10)	c)	20)	b)	30)	a)	40)	c)	50)	a)



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