



# Maharashtra Public Service Commission

## Notations :

- 1.Options shown in **green** color and with  icon are correct.
- 2.Options shown in **red** color and with  icon are incorrect.

<b>Question Paper Name :</b>	ChemicalAnalyser
<b>Subject Name :</b>	Assistant Chemical Analyser General State Service Group B
<b>Duration :</b>	60
<b>Total Marks :</b>	200
<b>Display Marks:</b>	Yes
<b>Share Answer Key With Delivery Engine :</b>	No
<b>Actual Answer Key :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console?</b>	Yes
<b>Change Font Color :</b>	No
<b>Change Background Color :</b>	No
<b>Change Theme :</b>	No
<b>Help Button :</b>	No
<b>Show Reports :</b>	No
<b>Show Progress Bar :</b>	No
<b>Is this Group for Examiner? :</b>	No
<b>Examiner permission :</b>	Cant View
<b>Show Progress Bar? :</b>	No
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Is Section Default? :</b>	null

**Question Number : 1 Question Id : 630680149724 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following methods is used in enzyme preparation according to the property of the enzyme?

**Options :**

1. ✖ Thin layer chromatography
2. ✖ Gel filtration
3. ✖ Dialysis
4. ✔ Affinity chromatography

**Question Number : 2 Question Id : 630680149725 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following tracers is useful for interrelationship among 4-methylsterols and 4,4-dimethyl sterols?

**Options :**

1. ✖  $^{31}\text{P}$  phosphate
2. ✖  $^{15}\text{N}$  nitrate
3. ✔  $^{14}\text{C}$  acetate
4. ✖  $^{18}\text{S}$  sulphate

**Question Number : 3 Question Id : 630680149726 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following tracer is used in the plant growth studies for the uptake of calcium through stem from the soil?

**Options :**

1. ✔  $^{45}\text{Ca}$
2. ✖  $^{15}\text{N}$
3. ✖  $^{31}\text{P}$
4. ✖  $^{40}\text{Ar}$

**Question Number : 4 Question Id : 630680149727 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following creatine kinases levels are higher in children?

**Options :**

1. ✖ CK-MM and CK-BB
2. ✖ CK-MM and CK-BK
3. ✔ CK-MB and CK-BB
4. ✖ CK-BB and CK-BK

**Question Number : 5 Question Id : 630680149728 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the activators in trypsinogen and proelastase zymogens, respectively?

**Options :**

1. ✖ Pepsin and trypsin
2. ✖ Trypsin and rennin
3. ✔ Enterokinase and trypsin
4. ✖ Pepsin and enterokinase

**Question Number : 6 Question Id : 630680149729 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Who discovered ABO blood group system?

**Options :**

1. ✖ Georg Simon
2. ✔ Karl Landsteiner
3. ✖ Enrico Fermi
4. ✖ Henri Becquerel

**Question Number : 7 Question Id : 630680149730 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following arteries is involved in carrying deoxygenated blood from the right ventricle to the lungs?

**Options :**

1. ✔ Pulmonary artery
2. ✖ Aorta
3. ✖ Systemic artery
4. ✖ Lingual artery

**Question Number : 8 Question Id : 630680149731 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

The antigens for Rh and ABO blood groups are present on:

**Options :**

1. ✖ white blood cells
2. ✖ chromosomes
3. ✖ platelets
4. ✔ red blood cells

**Question Number : 9 Question Id : 630680149732 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What is the main use of Donnan membrane technique (DMT)?

**Options :**

1. ✖ Anions and cations detection
2. ✖ Elemental analysis
3. ✖ Detection of crystalline compounds
4. ✔ Measure free and labile metal in solution

**Question Number : 10 Question Id : 630680149733 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the three different temperatures reached during the polymerase chain reaction to facilitate the denaturation and hybridisation of the DNA strands?

**Options :**

1. ✖ Starting temperature is elevated to 72°C, then lowered to 60°C and again increased to 62°C.
2. ✖ Starting temperature is elevated to 90°C, then lowered to 60°C and again increased to 78°C.
3. ✔ Starting temperature is elevated to 95°C, then lowered to 60°C and again increased to 72°C.
4. ✖ Starting temperature is elevated to 85°C, then lowered to 60°C and again increased to 75°C.

**Question Number : 11 Question Id : 630680149734 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Taq polymerase derived from the thermophilic bacteria *Thermus aquaticus* is active at:

**Options :**

1. ✖ 98°C
2. ✖ 65°C
3. ✔ 72°C
4. ✖ 42°C

**Question Number : 12 Question Id : 630680149735 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Polymerase Chain Reaction is a revolutionary method developed by \_\_\_\_\_.

**Options :**

1. ✖ Paul Flory
2. ✖ Peter Debye
3. ✔ Kary Mullis
4. ✖ Francis Mark

**Question Number : 13 Question Id : 630680149736 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following is used to amplify or copy, a specific DNA target from a mixture of DNA molecules?

**Options :**

1. ✖ DNA finger printing
2. ✖ Gel electrophoresis
3. ✖ Electrophoresis
4. ✔ Polymerase Chain Reaction

**Question Number : 14 Question Id : 630680149737 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following separations is NOT possible by using electrophoresis?

**Options :**

1. ✖ Carbohydrates
2. ✖ Nucleic acids
3. ✖ Proteins
4. ✔ Lipids

**Question Number : 15 Question Id : 630680149738 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following species is used for extraction of Agarose?

**Options :**

1. ✔ Gelidium nudifrons
2. ✖ Lycasusican esculentum
3. ✖ Ficum benghalensis
4. ✖ Agrostis stolonifera

**Question Number : 16 Question Id : 630680149739 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following technique separates charged particles using electric field?

**Options :**

1. ✖ Hydrolysis
2. ✖ Distillation
3. ✔ Electrophoresis
4. ✖ Crystallisation

**Question Number : 17 Question Id : 630680149740 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Electrophoretic mobility is the ratio of :

**Options :**

1. ✖ it's intensity, and the velocity of the biomolecule in the electric field
2. ✔ the velocity of the biomolecule in the electric field, and it's intensity

3. ✖ the distance of the biomolecule in the electric field, and it's intensity
4. ✖ the velocity of the biomolecule in the electric field, and it's intra molecular distance

**Question Number : 18 Question Id : 630680149741 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In younger animals, carbohydrates are helpful in the absorption of:

**Options :**

1. ✖ magnesium and sulphur
2. ✖ sodium and chlorine
3. ✔ calcium and phosphorous
4. ✖ phosphorous and potassium

**Question Number : 19 Question Id : 630680149742 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Radioimmunoassay (RIA) is a very sensitive in vitro technique used to measure concentrations of

**Options :**

1. ✖ Plasma
2. ✖ Urine
3. ✔ Hormone levels in blood
4. ✖ Proteins

**Question Number : 20 Question Id : 630680149743 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Who among the following developed the radioimmunoassay technique for measuring concentration of insulin in blood?

**Options :**

1. ✖ Carl Linnaeus
2. ✖ Louis-Charles (jointly)
3. ✔ Berson-Yalow (jointly)
4. ✖ Francis Crick

**Question Number : 21 Question Id : 630680149744 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following are the examples of polysaccharides and oligosaccharides, respectively?

**Options :**

1. ✖ Cellulose and glycogen
2. ✖ Raffinose and stachyose
3. ✖ Starch and glycogen

4. ✓ Glycogen and stachyose

Question Number : 22 Question Id : 630680149745 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

What is the pH range of lysis buffer?

Options :

1. ✓ 7.9
2. ✗ 4.9
3. ✗ 6.9
4. ✗ 8.9

Question Number : 23 Question Id : 630680149746 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

The major buffer system in the body fluid is:

Options :

1. ✗  $\text{H}_2\text{SO}_4/\text{HSO}_4^-$
2. ✗  $\text{HNO}_3/\text{NO}_3^-$
3. ✓  $\text{H}_2\text{CO}_3/\text{HCO}_3^-$
4. ✗  $\text{H}_2\text{SO}_3/\text{HSO}_3^-$

Question Number : 24 Question Id : 630680149747 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

Which of the following is a salt buffer system?

Options :

1. ✗  $\text{CH}_3\text{COOH}/\text{CH}_3\text{COO}^-$
2. ✗  $\text{NH}_3.\text{H}_2\text{O}/\text{NH}_4^+$
3. ✗  $\text{H}_2\text{CO}_3/\text{HCO}_3^-$
4. ✓  $\text{NaH}_2\text{PO}_4/\text{Na}_2\text{HPO}_4$

Question Number : 25 Question Id : 630680149748 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

Which of the following carbohydrates are present as stored energy in plant cells and animal cells, respectively?

Options :

1. ✗ Starch and maltose
2. ✗ Glycolipid and sucrose
3. ✓ Starch and glycogen

4. ✖ Glycolipid and glycogen

**Question Number : 26 Question Id : 630680149749 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Wrong Marks : 0.5**

Which of the following IR radiation sources emits maximum radiation at  $5200\text{ cm}^{-1}$ ?

**Options :**

1. ✔ Nernst glower
2. ✖ Mercury arc
3. ✖ Globar source
4. ✖ Incandescent lamp

**Question Number : 27 Question Id : 630680149750 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Wrong Marks : 0.5**

Which of the following fuels has the highest maximum temperature obtained in oxygen oxidant?

**Options :**

1. ✖ Cyanogen
2. ✖ Butane
3. ✔ Acetylene
4. ✖ Propane

**Question Number : 28 Question Id : 630680149751 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Wrong Marks : 0.5**

Which of the following X-ray diffraction methods is generally NOT useful for investigating the internal structures?

**Options :**

1. ✖ Powder method
2. ✔ Magnetic method
3. ✖ Rotating crystal method
4. ✖ Laue photographic method

**Question Number : 29 Question Id : 630680149752 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Wrong Marks : 0.5**

Which of the following elements has the lowest sensitivity limit (in ppm) in flame photometry?

**Options :**

1. ✔ Barium
2. ✖ Tin
3. ✖ Lead
4. ✖ Chromium



**Question Number : 30 Question Id : 630680149753 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following decreasing orders is correct with respect to detection limits?

**Options :**

1. ✖  $Ba > As > Bi > Al$
2. ✖  $As > Bi > Ba > Al$
3. ✔  $Bi > Ba > As > Al$
4. ✖  $Ba > As > Al > Bi$

**Question Number : 31 Question Id : 630680149754 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In the medical field, which of the following elements are routinely determined in blood analysis by flame photometry?

**Options :**

1. ✔ Na, K, Ca and Mg
2. ✖ Ba, Sn, Pb and Sb
3. ✖ Cr, Hg, Mo and Ru
4. ✖ Al, Cs, Ga and Ge

**Question Number : 32 Question Id : 630680149755 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following groups decreases, or even destroys, fluorescence?

**Options :**

1. ✖  $-OCH_3$
2. ✖  $-OH$
3. ✔  $-NO_2$
4. ✖  $-NH_2$

**Question Number : 33 Question Id : 630680149756 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following fluorescent indicators changes its colour from Blue to colourless at pH range 4.4 – 6.3?

**Options :**

1. ✖ 2-Naphthaquinone
2. ✔ Eosin
3. ✖ Quinine sulphate
4. ✖ Acridine

**Question Number : 34 Question Id : 630680149757 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following decreasing orders is correct for  $\pi$ -bonding abilities of some ligands by Mossbauer spectra?

**Options :**

1. ✖  $\text{NO}_2^- > \text{P}(\text{C}_6\text{H}_5)_3 > \text{NH}_3$
2. ✔  $\text{P}(\text{C}_6\text{H}_5)_3 > \text{NO}_2^- > \text{NH}_3$
3. ✖  $\text{P}(\text{C}_6\text{H}_5)_3 > \text{NH}_3 > \text{NO}_2^-$
4. ✖  $\text{NO}_2^- > \text{NH}_3 > \text{P}(\text{C}_6\text{H}_5)_3$

**Question Number : 35 Question Id : 630680149758 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In an emission determination, it was found that the concentration of barium in a place extract was linear over the 0-15 ppm range. What is the concentration of a solution that gave a reading of 87, when water was set at zero and the 15 ppm standard was set at 100?

**Options :**

1. ✖ 17 ppm
2. ✖ 22 ppm
3. ✖ 9 ppm
4. ✔ 13 ppm

**Question Number : 36 Question Id : 630680149759 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following increasing orders is correct with respect to equivalent conductance of ions at infinite dilution at 25°C?

**Options :**

1. ✖  $\text{Co}^{2+} < \text{Ag}^+ < \text{Fe}^{2+} < \text{Pb}^{2+}$
2. ✖  $\text{Fe}^{2+} < \text{Ag}^+ < \text{Pb}^{2+} < \text{Co}^{2+}$
3. ✔  $\text{Fe}^{2+} < \text{Co}^{2+} < \text{Ag}^+ < \text{Pb}^{2+}$
4. ✖  $\text{Ag}^+ < \text{Fe}^{2+} < \text{Pb}^{2+} < \text{Co}^{2+}$

**Question Number : 37 Question Id : 630680149760 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following substances has the highest dielectric constant?

**Options :**

1. ✖ Benzene
2. ✖ Carbon tetrachloride

- 3. ✓ Aniline
- 4. ✗ Chloroform

**Question Number : 38 Question Id : 630680149761 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

One of the limitations of hydrogen electrode in electrolysis process?

**Options :**

- 1. ✗ It gives no salt error.
- 2. ✓ It is not easy to get pure hydrogen.
- 3. ✗ It can be used over the entire pH range.
- 4. ✗ It is a fundamental electrode to which all measurements of pH are ultimately referred.

**Question Number : 39 Question Id : 630680149762 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following bases has no keto group in nucleic acid?

**Options :**

- 1. ✗ Guanine
- 2. ✗ Uracil
- 3. ✗ Cytosine
- 4. ✓ Adenine

**Question Number : 40 Question Id : 630680149763 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

How many hydrogen bonds are present between Adenine and Thymine?

**Options :**

- 1. ✗ Five
- 2. ✓ Two
- 3. ✗ Four
- 4. ✗ Three

**Question Number : 41 Question Id : 630680149764 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following is an amine?

**Options :**

- 1. ✗ Estrogen
- 2. ✗ Androgen
- 3. ✗ Winstrol
- 4. ✓ Epinephrine

**Question Number : 42 Question Id : 630680149765 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following is responsible for the preparation of the uterus for implantation of a fertilised egg?

**Options :**

1. ✖ Cortisone
2. ✖ Adenine
3. ✔ Progesterone
4. ✖ Thymine

**Question Number : 43 Question Id : 630680149766 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following is an iodinated derivative of tyrosine?

**Options :**

1. ✖ Adrenaline
2. ✔ Thyroxine
3. ✖ Cytosine
4. ✖ Insulin

**Question Number : 44 Question Id : 630680149767 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following reducing agents is added to reduce the disulphide linkages to prevent any tertiary protein folding?

**Options :**

1. ✖ 3-mercaptoethanol
2. ✖ 4-mercaptoethanol
3. ✔ 2-mercaptoethanol
4. ✖ 5-mercaptoethanol

**Question Number : 45 Question Id : 630680149768 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following steroid hormones controls the level of excretion of water and salt by the kidney?

**Options :**

1. ✖ Testosterone
2. ✖ Adrenaline
3. ✖ Thyroxine
4. ✔ Mineralocorticoids

**Question Number : 46 Question Id : 630680149769 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following tests is useful for distinguishing disaccharides and monosaccharides?

**Options :**

1. ☒ Barfoed's test
2. ☐ Saponification test
3. ☐ Melting test
4. ☐ Gabriel test

**Question Number : 47 Question Id : 630680149770 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following sterols is NOT found in plants?

**Options :**

1. ☐ Stigmasterol
2. ☒ Ergosterol
3. ☐ Sitosterol
4. ☐ Campesterol

**Question Number : 48 Question Id : 630680149771 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

N-acetylmuramic acid is a derivative of glucosamine, in which lactic acid is linked to oxygen at \_\_\_\_\_ of N-acetylglucosamine.

**Options :**

1. ☐ C-2
2. ☐ C-4
3. ☒ C-3
4. ☐ C-6

**Question Number : 49 Question Id : 630680149772 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following carbohydrates is found mostly in the liver and muscles of animals?

**Options :**

1. ☐ Lactose
2. ☒ Glycogen
3. ☐ Starch
4. ☐ Maltose

**Question Number : 50 Question Id : 630680149773 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Lipids are insoluble in \_\_\_\_\_.

**Options :**

1. ✖ chloroform
2. ✔ water
3. ✖ benzene
4. ✖ ether

**Question Number : 51 Question Id : 630680149774 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What type of transition is possible in azo compounds?

**Options :**

1. ✖  $\sigma \rightarrow \sigma^*$
2. ✖  $n \rightarrow \pi^*$
3. ✔  $\pi \rightarrow \pi^*$
4. ✖  $\sigma \rightarrow \pi$

**Question Number : 52 Question Id : 630680149775 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following solvents has the highest UV cut-off area?

**Options :**

1. ✖ Acetonitrile
2. ✖ Water
3. ✖ Methanol
4. ✔ Chloroform

**Question Number : 53 Question Id : 630680149776 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What is the correct decreasing order of energy level of  $n \rightarrow \sigma^*$ ?

**Options :**

1. ✔  $\text{CH}_3\text{-OH} > \text{CH}_3\text{-NH}_2 > \text{CH}_3\text{-SH}$
2. ✖  $\text{CH}_3\text{-NH}_2 > \text{CH}_3\text{-OH} > \text{CH}_3\text{-SH}$

3. ✖  $\text{CH}_3\text{-SH} > \text{CH}_3\text{-NH}_2 > \text{CH}_3\text{-OH}$

4. ✖  $\text{CH}_3\text{-SH} > \text{CH}_3\text{-OH} > \text{CH}_3\text{-NH}_2$

**Question Number : 54 Question Id : 630680149777 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the isoelectric points of lysine and proline, respectively?

**Options :**

1. ✖ 5.6 and 4.9

2. ✔ 9.47 and 6.3

3. ✖ 3.5 and 9.5

4. ✖ 4.9 and 2.3

**Question Number : 55 Question Id : 630680149778 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In which of the following microscopes is the surface of the specimen irradiated with a very narrow beam of electrons?

**Options :**

1. ✖ Emission spectroscopy

2. ✔ Scanning electron microscopy

3. ✖ X-ray spectroscopy

4. ✖ Transmission electron microscopy

**Question Number : 56 Question Id : 630680149779 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In Scanning electron microscopy, the intensity or the number of secondary electrons doesn't depend on

**Options :**

1. ✖ the number of electrons reabsorbed by surrounding

2. ✖ the number of electrons ejected

3. ✖ the chemical composition of the irradiated object

4. ✔ the liberated electrons from source are very few

**Question Number : 57 Question Id : 630680149780 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In SEM, the magnified image of the surface topography of the specimen is obtained on

**Options :**

1. ✖ the anode ray tube

2. ✔ the cathode ray tube

3. ✖ vacuum chamber

4. ✖ phosphorescent screen

**Question Number : 58 Question Id : 630680149781 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following methods are provided by NMR spectrometer for determining structure in soluble chemical compounds?

**Options :**

1. ✖ Inaccurate and non-destructive
2. ✖ Accurate and destructive
3. ✔ Accurate and non-destructive
4. ✖ Inaccurate and destructive

**Question Number : 59 Question Id : 630680149782 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Isoelectric point is a value of

**Options :**

1. ✖ Molarity
2. ✖ Gram molecular weight
3. ✔ Exact pH value
4. ✖ Normality

**Question Number : 60 Question Id : 630680149783 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Cation exchange chromatography retains positively charged cations, as the stationary phase in the column displays negatively charged functional group, such as:

**Options :**

1. ✖ aniline
2. ✖ nitrobenzene
3. ✔ phosphoric acid
4. ✖ chloroform

**Question Number : 61 Question Id : 630680149784 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following are the weak acid cation exchanger, and strong base anion exchanger, respectively?

**Options :**

1. ✖ Sulphuric acid and amine
2. ✖ Carboxylic acid and amine
3. ✔ Carboxylic acid and quaternary amine
4. ✖ Sulphuric acid and quaternary amine



**Question Number : 62 Question Id : 630680149785 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Acetylcholine esterase is purified by using:

**Options :**

1. ☒ affinity chromatography
2. ☐ cation exchanger
3. ☐ anion exchanger
4. ☐ gel filtration

**Question Number : 63 Question Id : 630680149786 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following are used to purify Cytochrome-C and alpha amylase, respectively?

**Options :**

1. ☐ Q-Sepharose and DEAE-cellulose
2. ☒ Amberlite CG-50 and Sephacryl S-300
3. ☐ Amberlite CG-50 and DEAE-cellulose
4. ☐ DEAE-cellulose and Sephacryl S-300

**Question Number : 64 Question Id : 630680149787 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Alkaline protease and peroxidase are purified/separated by using

**Options :**

1. ☐ cation exchangers
2. ☐ affinity chromatography
3. ☒ anion exchangers
4. ☐ gel filtration

**Question Number : 65 Question Id : 630680149788 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following commercial resins is related to strong base?

**Options :**

1. ☐ Amberlite IR-200
2. ☐ Zerolite MPF
3. ☐ XFS 4195
4. ☒ Lewatit MP200

**Question Number : 66 Question Id : 630680149789 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following types of chromatography is used for separating compounds that have hydrophobic moieties?

**Options :**

1. ✖ Normal phase chromatography
2. ✖ Ion exchange chromatography
3. ✔ Reversed phase chromatography
4. ✖ Gel permeation chromatography

**Question Number : 67 Question Id : 630680149790 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

In which of the following types of paper chromatography does the mobile phase move horizontally over a circular sheet of paper?

**Options :**

1. ✖ Two-dimensional paper chromatography
2. ✔ Radial paper chromatography
3. ✖ Ascending paper chromatography
4. ✖ Descending paper chromatography

**Question Number : 68 Question Id : 630680149791 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What percentage of pentosans are present in Whatman paper?

**Options :**

1. ✖ 0.01% – 0.4%
2. ✖ 8.0% – 12.5%
3. ✖ 12.0% - 18.0%
4. ✔ 0.4% – 0.8%

**Question Number : 69 Question Id : 630680149792 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is INCORRECT with respect to paper chromatography?

**Options :**

1. ✖ In paper chromatography, the solvent moves by capillary action.
2. ✖ Paper chromatography is based on solid-liquid adsorption.
3. ✔ Paper chromatography has longer stationary phase.
4. ✖ Paper chromatography requires less amount of substance.

**Question Number : 70 Question Id : 630680149793 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following is partition chromatography?

**Options :**

1. ✓ Liquid-liquid chromatography
2. ✗ Ion exchange chromatography
3. ✗ Liquid-solid chromatography
4. ✗ Gel permeation chromatography

**Question Number : 71 Question Id : 630680149794 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following chromatography types is the best for separation of an antibiotic from a broth mixture?

**Options :**

1. ✗ Thin layer chromatography
2. ✗ Paper chromatography
3. ✓ High performance liquid chromatography
4. ✗ Column chromatography

**Question Number : 72 Question Id : 630680149795 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is INCORRECT with respect to gas chromatography?

**Options :**

1. ✗ In gas chromatography, the sample to be tested must be volatile.
2. ✗ In Gas chromatography mobile phase could be a gas
3. ✓ Gas chromatography is done at low temperatures.
4. ✗ In gas chromatography, the stationary phase is a low volatile liquid adsorbed on a solid support

**Question Number : 73 Question Id : 630680149796 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following will change into a white powder after it is heated, due to the loss of water during crystallisation?

**Options :**

1. ✗ Green vitriol
2. ✗ Potash alum
3. ✗ Benzaldehyde
4. ✓ Blue vitriol

**Question Number : 74 Question Id : 630680149797 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is correct with respect to crystallisation and evaporation?

**Options :**

- ✖ Crystallisation converts a liquid into its gaseous phase at a specific high temperature.
- ✖ Crystallisation is less efficient because some solids decompose on heating.
- ✖ Evaporation is used in separating pure solid from liquid with high efficiency.
- ✔ Crystallisation is the formation of solid crystals from a liquid.

**Question Number : 75 Question Id : 630680149798 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is INCORRECT with respect to fractional distillation?

**Options :**

- ✖ Fractional distillation is a process of separation of 2 immiscible liquids.
- ✖ Fractional distillation is different from distillation because of the presence of fractionating column.
- ✖ Difference in the boiling point of 2 liquids fractional distillation is less than 25 K.
- ✔ Liquid nitrogen gas cannot be separated from air using fractional distillation.

**Question Number : 76 Question Id : 630680149799 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

One milliequivalent is:

**Options :**

- ✖ 1000 chemical equivalents
- ✖ 100 chemical equivalents
- ✔ 1/1000 chemical equivalents
- ✖ 1/100 chemical equivalents

**Question Number : 77 Question Id : 630680149800 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is correct with respect to molarity and molality?

**Options :**

- ✖ Molarity has kilograms of solvent and molality depends on temperature of solution
- ✖ Molarity depends on temperature of solution and molality depends on volume of solution
- ✖ Molarity depends on volume of solution and molality depends on atmospheric pressure
- ✔ Molarity depends on temperature of solution and molality has kilograms of solvent.

**Question Number : 78 Question Id : 630680149801 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

The molar mass and equivalent masses of  $\text{Ca(OH)}_2$ , respectively, are: (Atomic number of Ca, O and H are 20, 8 and 1 respectively)

**Options :**

1. ✖ 1 and 2
2. ✖ 37 and 74
3. ✔ 74 and 37
4. ✖ 2 and 1

**Question Number : 79 Question Id : 630680149802 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Parts per million can be expressed as \_\_\_\_\_.

**Options :**

1. ✔ mg/l
2. ✖ gm/L
3. ✖ ml/kg
4. ✖ l/kg

**Question Number : 80 Question Id : 630680149803 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following processes is the most widely used chemical precipitation process?

**Options :**

1. ✖ Carbonate precipitation
2. ✖ Nitrates precipitation
3. ✖ Hydride precipitation
4. ✔ Hydroxide precipitation

**Question Number : 81 Question Id : 630680149804 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following organic reagents is used for the reduction and determination of gold?

**Options :**

1. ✖ Pinene
2. ✔ Hydroquinone
3. ✖ Cumene
4. ✖ Styrene

**Question Number : 82 Question Id : 630680149805 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following methods is NOT suitable for extraction techniques?

**Options :**

1. ✖ Enzyme assisted extraction

2. ✖ Ultrasound assisted extraction
3. ✔ X-ray diffraction assisted extraction
4. ✖ Solvent extraction

**Question Number : 83 Question Id : 630680149806 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the pH ranges of Thymol blue and methyl orange indicators, respectively?

**Options :**

1. ✖ 8.0-9.6 and 9.1-10.6
2. ✔ 8.0-9.6 and 3.1-4.4
3. ✖ 9.1-10.6 and 3.1-4.4
4. ✖ 9.1-10.6 and 8.0-9.6

**Question Number : 84 Question Id : 630680149807 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the colours of Phenol red indicator in acidic medium and basic medium, respectively?

**Options :**

1. ✖ Colourless and blue
2. ✖ Yellow and blue
3. ✖ Colourless and red
4. ✔ Yellow and red

**Question Number : 85 Question Id : 630680149808 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following titrants is NOT used in non-aqueous titrations of weak acids?

**Options :**

1. ✖ Calcium methoxide
2. ✔ Potassium methoxide
3. ✖ Strontium methoxide
4. ✖ Aluminium methoxide

**Question Number : 86 Question Id : 630680149809 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following nonaqueous solvents is an example of Protophilic solvents?

**Options :**

1. ✔ Ketone
2. ✖ Formic acid
3. ✖ Chloroform

4. ✖ Acetonitrile

Question Number : 87 Question Id : 630680149810 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

Mayonnaise is an example of what type of solution?

Options :

1. ✖ Solid sol
2. ✖ Solid aerosol
3. ✔ Emulsion
4. ✖ Gel

Question Number : 88 Question Id : 630680149811 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

Antifreeze is an example of:

Options :

1. ✖ solid in solid
2. ✔ liquid in liquid solution
3. ✖ gas in liquid
4. ✖ Liquid in gas

Question Number : 89 Question Id : 630680149812 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

If 16.18 is the actual value of a quantity and 19.53 is the experimentally measured value, then the absolute error will be: (in percentage)

Options :

1. ✖ 35.71
2. ✔ 3.35
3. ✖ 19.53
4. ✖ 10.18

Question Number : 90 Question Id : 630680149813 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Wrong Marks : 0.5

Who proposed the double helical structure of DNA?

Options :

1. ✖ Joseph John Thomson
2. ✔ Francis Crick
3. ✖ Galileo Galilei
4. ✖ Charles Darwin

**Question Number : 91 Question Id : 630680149814 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following bases contains an amino acid group at C-4?

**Options :**

1. ✖ Adenine
2. ✖ Guanine
3. ✔ Cytosine
4. ✖ Thymine

**Question Number : 92 Question Id : 630680149815 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Cyclic voltammetry, which has a three-electrode system, does NOT consist of

**Options :**

1. ✖ counter electrode
2. ✔ hydric electrode
3. ✖ working electrode
4. ✖ reference electrode

**Question Number : 93 Question Id : 630680149816 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the equivalent masses of  $\text{Ca(OH)}_2$  and  $\text{H}_2\text{SO}_4$ , respectively?

**Options :**

1. ✖ 28 and 46
2. ✖ 74 and 98
3. ✔ 37 and 49
4. ✖ 37 and 98

**Question Number : 94 Question Id : 630680149817 Is Question Mandatory : No Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

What are the pKa values of Bromocresol green and Cresol purple, respectively?

**Options :**

1. ✖ 2.6 and 5.6
2. ✖ 5.6 and 9.1
3. ✔ 4.7 and 8.3
4. ✖ 3.8 and 8.7

**Question Number : 95 Question Id : 630680149818 Is Question Mandatory : No Calculator : None**



**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Calculate the absolute error value when actual length is 28 mm and measured length is 25.4 mm respectively.

**Options :**

1. ✖ 53.4
2. ✖ 25.4
3. ✖ 28
4. ✔ 2.6

**Question Number : 96 Question Id : 630680149819 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Find the relative error value, where the actual and measured values are 252.14 mm and 249.02 mm.

**Options :**

1. ✔ 0.0123 %
2. ✖ 1.2358 %
3. ✖ 0.2561 %
4. ✖ 0.1963 %

**Question Number : 97 Question Id : 630680149820 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following statements is INCORRECT with respect to gravimetric analysis?

**Options :**

1. ✔ Gravimetric analysis is potentially less accurate than volumetric analysis.
2. ✖ Gravimetric analysis avoids problems with temperature fluctuation, with volumetric analysis.
3. ✖ Gravimetric analysis is used for determination of purity, and thermal stability of both primary and second standard.
4. ✖ Gravimetric analysis is used for determination of composition of complex mixtures.

**Question Number : 98 Question Id : 630680149821 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following indicators is colourless in acidic medium?

**Options :**

1. ✖ Methyl yellow
2. ✔ Trinitro benzoic acid
3. ✖ Phenol red
4. ✖ Alizarin yellow

**Question Number : 99 Question Id : 630680149822 Is Question Mandatory : No Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following precipitate is formed when glycol reacts with periodate ion?

**Options :**

1. ✖  $\text{I}^-$
2. ✖  $\text{OH}^-$
3. ✔  $\text{IO}_3^-$
4. ✖  $\text{SO}_4^{2-}$

**Question Number : 100 Question Id : 630680149823 Is Question Mandatory : No Calculator : None  
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Wrong Marks : 0.5**

Which of the following rainfall types has intensity traced to 2.5 mm/h?

**Options :**

1. ✖ Moderate rain
2. ✔ Light rain
3. ✖ Heavy rain
4. ✖ Violent rain