



JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION
Resham Ghar Colony, Bakshi Nagar, Jammu

NOTICE
DATED: /7.02.2018

The syllabus for conducting Written test (Multiple Choice Questions MCQS) for the post of Lecturer (10+2) Bio-Chemistry in School Education Department is notified for the information of the concerned candidates as under:-

SUBJECT: BIO-CHEMISTRY

- 1. Chemistry of Carbohydrates**
Classification: Monosaccharides- Isomerism, D and L forms, Stereoisomerism, epimers, anomers, pyrans and furans. Sugar acids, sugar alcohols, aminosugars and their other derivatives. Disaccharides: homo- and hetero- disaccharides, Biologically important disaccharides. Polysaccharides: Storage forms-Glycogen, Starch, Insulin. Structural forms: Cellulose, Chitin, Heteropolysaccharides/ glucosamineglycans: Hyaluronic acid, Heparin, Chondroitin sulfate, Dermatan sulphates and their biological functions.
- 2. Chemistry of Lipids**
Classification of lipids: Fatty acids, saturated/unsaturated, odd and even carbon, essential fatty acids; Nomenclature and properties of saturated and unsaturated fatty acids; Chemical composition and properties; Triacylglycerols; waxes Phosphoglycerides-Lecithins, Cephalins, Phosphatidyl-serine, Phosphatidyl-inositol and their lyso derivatives; Phosphosphingosides/sphingomyelins, glycolipids and gangliosides, plasmalogens, Cardiolipins, cholesterol and prostaglandins. Functions of lipids, lipid bilayer, micelles and liposomes. Functions of lipids and lipoproteins.
- 3. Chemistry of Proteins**
Amino acids and their classifications; pKa values, pI, peptide bond; primary-secondary-, tertiary- and quaternary- structure of proteins; α helices and β pleated sheets; classification and functions of proteins; conjugated proteins-

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glycoproteins and lipoproteins. Essential and non-essential amino acids. Proteins denaturation and renaturation. Mechanism of Protein folding.

4. **Chemistry of nucleic acids**

Nitrogenous bases, nucleosides and de-oxynucleosides and their phosphorylated forms, poly-nucleotides. DNA: Primary, secondary and Tertiary structure and different conformers, A, B and Z-DNA; RNA and its species/types and their functions. Primary, Secondary and Tertiary structure of RNA. Purine and Pyrimidine analogues.

5. **Hormones**

Definition and classification of hormones, their receptors on cell surfaces/transport and mechanism of action. Pituitary Hormones and their control by Hypothalamus, Gastrointestinal tract, Pancreas, Thyroid, Parathyroid, Adrenal glands, Steroid hormones, Sex hormones.

6. **Metabolism of carbohydrates**

Glycolysis, Glycogenesis, glycogenolysis, gluconeogenesis. Citric acid cycle, Its functions in energy generation and biosynthesis of energy rich bonds. Alternate pathways of Carbohydrate metabolism, Biosynthesis of glycogen, starch and oligosaccharides. Electron transport chain, Oxidative Phosphorylation, Hexose monophosphate pathways and uronic acid pathways.

7. **Metabolism of lipids**

Lipolysis, α -, β -, ω - oxidation of fatty acids, Biogenesis of fats, Biosynthesis of essential fatty acids, catabolism and biosynthesis of Phosphoglycerides and sphingo lipids, Plasmalogens, Cardiolipins, Cholesterol and eicosanoids. Desaturase and elongase. Biosynthesis of Triacylglycerols. Biosynthesis pathways for terpenes. Steroids and Prostaglandins.

8. **Metabolism of amino acids**

Catabolism of individual amino acids, ketogenic and glucogenic amino acids, biogenesis of essential and non-essential amino acids, Urea cycle and its regulation. Biosynthesis and degradation of amino acids and their regulations.

9. **Nucleic acid Metabolism**

Biogenesis/Biosynthesis and degradation of purines and pyrimidines nucleotides, Formation of nucleoside diphosphates and triphosphates and

their de-oxy derivatives. Catabolism of nucleotides. Structure and regulation of ribonucleotide reductase. Biosynthesis of ribonucleotides, deoxy ribonucleotides and Polynucleotides.

10. **Enzymes**

Definition, cofactors, coenzymes, zymogens, isozymes, substrate specificity and classification, sub-cellular localization, isolation and purification of enzymes, Allosteric enzymes. Enzyme kinetics of reactions catalysed by one, two or multi substrates, Henri Michaelis –Menten equation, Briggs-Haldane modifications. Methods of determining K_m and V_{max} , Enzyme inhibitions: partially, fully, competitive, non-competitive, uncompetitive and mixed type inhibitions. Regulation of enzyme involving product, feedback and allosteric inhibition and feed forward stimulation. Regulation of enzymes at gene level. Industrial Application of enzymes.

Sunita Anand
(Sunita Anand) KAS

Secretary,

J&K Public Service Commission.

No: PSC/DR/Syllabus/2016/

Dated: 17.02.2018

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1. Director General, Information, J&K Government, Jammu for favour of getting the notice published in atleast two local leading English dailies of Jammu/Srinagar.
2. General Manager, Government Press, Jammu for publication of the notice in the next issue of the Government Gazette.
3. Deputy Secretary/Under Secretary, J&K Public Service Commission.
4. Private Secretary to Chairman, for information of the Hon'ble Chairman.
5. Private Secretary to Member, _____ for information of the Hon'ble Member.
6. I/C Website for uploading the notice on website;
7. I/C Camp Office, Srinagar for pasting the notice on the Notice Board.
8. Main file/Programme file.