## **PROVISIONAL ANSWER KEY**

Question Paper Code: 68/2018/OL Category Code: 071/2015 Exam: Assistant Research Officer-Chemistry Medium of Question: English Date of Test 23-01-2019 Department Ayurveda Medical Education Alphacode А Question1:-The Socio-religious organisation 'The Prarthana Samaj' was founded by A:-M.G. Ranade B:-Keshab Chandra Sen C:-Raja Ram Mohan Roy D:-Swami Dayananda Saraswati Correct Answer:- Option-A Question2:-Swami Vivekananda attended the Parliament of religious held at Chicago in A:-1880 B:-1815 C:-1890 D:-1893 Correct Answer:- Option-D Question3:-Indian National Congress Annual Session in 1905 held at Benares was presided by A:-Mrs. Annie Besant B:-Pandit B.N. Dhar C:-Gopala Krishna Gokhale D:-R.C. Dutt Correct Answer:- Option-C Question4:-The Newspapers, Mahratta and Keseri were published by A:-Tilak B:-S. Subramanian Iyer C:-Annie Besant D:-Birendra Ghosh Correct Answer:- Option-A Question5:-Hindustan Socialist Republican Association (HSRA) was founded under the leadership of A:-Shyamji Krishna Varma B:-Khudiram Bose C:-V.D. Savar D:-Chandra Shekhar Azad Correct Answer:- Option-D Question6:-The Asiatic Society of Bengal was founded by A:-David Hare **B:-Sir. William Jones** C:-Macaulay D:-Sir. Charles Wood Correct Answer:- Option-B Question7:-Jalian Wala Bagh tragedy occurred in A:-1922 B:-1918 C:-1925 D:-1919 Correct Answer:- Option-D Question8:-The Karakoram Mountain range is situated in the state of A:-Rajasthan **B:-Gujarat** C:-Jammu and Kashmir D:-Orissa Correct Answer:- Option-C Question9:-Which of the following countries share the largest border length with India?

A:-China **B:-Bangladesh** C:-Nepal D:-Sreelanka Correct Answer:- Option-B Question10:-The famous hill station 'Kodai Kanal' lies in A:-Western Ghats B:-Palani hills C:-Nilgiri hills D:-Cardamom hills Correct Answer:- Option-B Question11:-The film "Ayya Vazhi" is based on the life of A:-Ayyankali B:-Kumara Guru C:-Ayya Vaikundar D:-Sree Narayana Guru Correct Answer:- Option-C Question12:-The book Jathi Kummi was written by A:-Dr. Palpu B:-Mannathu Padmanabhan C:-Pandit Kuruppan D:-Ayya Vaikundar Correct Answer:- Option-C Question13:-SNDP Yogam was founded in A:-1903 B:-1905 C:-1915 D:-1935 Correct Answer:- Option-A Question14:-The Social reformer Kunjan Pillai is known as A:-Mannathu Padmanabhan B:-Chattampi Swamikal C:-V.T. Bhattathirippad D:-Ayya Vaikundar Correct Answer:- Option-B Question15:-Who is known as 'The father of Muslim renaissance?' A:-Chalilkathu Kunjahammad Haji B:-Vaikom Abdul Khadar Moulavi C:-Abdulla Musaliyar D:-Hamadani Tangal Correct Answer:- Option-B Question16:-Who is appointed as the new chairman of ISRO? A:-K. Radhakrishnan B:-G. Madhavan Nair C:-A.S. Kiran Kumar D:-Dr. K. Sivan Correct Answer:- Option-D Question17:-The film that received the Oscar Academy Award for the best film in 2018? A:-The Shape of Water B:-Get out C:-Call me by your name D:-Darkest hour Correct Answer:- Option-A Question18:-Which country won Sultan Azlan Shah Cup 2018? A:-England **B:-South Korea** C:-Argentina D:-Australia Correct Answer:- Option-D

Ouestion 19:-Who was awarded the Sarswati Samman of 2017? A:-Harivansh Rai Bachan B:-Ramakanta Rath C:-Sitanshu Yashas Chandra D:-Vijay Tendulkar Correct Answer:- Option-C Question20:-India-France joined navel exercise is called A:-Varuna Exercise **B:-Malabar Exercise** C:-Indra D:-Sinbex Correct Answer:- Option-A Question21:-How many significant figures are present in the number 0.0025? A:-5 B:-4 C:-2 D:-6 Correct Answer:- Option-C Question22:-The expansion of DSC is A:-Differential Scanning Calorimetry **B:-Differential Scanning Coulometry C:-Differential Spinning Calorimetry D:-Differential Spinning Coulometry** Correct Answer:- Option-A Question23:-The property measured in TGA is A:-Change in weight B:-Rate of change in weight C:-Heat evolved or absorbed D:-Change in temperature Correct Answer:- Option-A Question24:-In Freundlich Adsorption Isotherm the value of 1/n is A:-1 in case of physical adsorption B:-1 in case of chemical adsorption C:-Between 0 and 1 in all cases D:-Between 0 and 2 in all cases Correct Answer:- Option-C Question 25:-If ((x)/(m)) is the mass of adsorbate per unit mass of adsorbent. p is the pressure of adsorbate gas and aand `b` are constants, which of the following represents "Langmuir" adsorption isotherm?  $A:-\log((x)/(m)) = \log((a)/(b)) + (1)/(a)\logp$ B:-(x)/(m)=(b)/(a)+(1)/(ap)C:-(x)/(m)=(1+bp)/(ap)D:-(1)/((x/m)) = (b)/(a)+(1)/(ap)Correct Answer:- Option-D Question26:-Both NMR and NQR spectra are absent in A:-Microwave **B:-Radio frequency** C:-X-ray D:-UV-visible Correct Answer:- Option-B Question27:-The molecule which is IR inactive but Raman active is A:-`"N 2"` B:-`"HCI"` C:-`"SO 2"` D:-Protein Correct Answer:- Option-A Question28:-The ESR of Naphthalene radical anion consists of A:-15 lines B:-25 lines C:-30 lines

D:-40 lines

Correct Answer:- Option-B

Question29:-Which of the compound I and II is expected to have a lower -C=O stretching frequency?

Fig.

A:-I B:-II C:-I and II D:-Cannot be predicted Correct Answer:- Option-B Question30:-What is the main factor on which chemical shift depends in Mossbauer spectrum? A:-Electron density **B:-Transition energy** C:-Intensity of light D:-All of these Correct Answer:- Option-A Question31:-The confinement in a Quantum wire is A:-0 D B:-2 D C:-1 D D:-3 D Correct Answer:- Option-B Question32:-The expansion of 'SPR' is A:-Surface Plasmon Resonance **B:-Surface Proton Resonance C:-Structural Plasmon Resonance D:-Structural Proton Resonance** Correct Answer:- Option-A Question33:-Quantum dots are A:-1 dimensional **B:-0** dimensional C:-3 dimensional D:-2 dimensional Correct Answer:- Option-B Question34:-Dip-Pen nanolithography works with the help of A:-TEM B:-SEM C:-AFM D:-EDAX Correct Answer:- Option-C Question35:-The chemical bonds of carbon nanotube is composed of A:-`"sp"` bonds B:-`"sp^2"` bonds C:-`"sp^3"` bonds D:-none of these Correct Answer:- Option-B Question36:-The polar groups in cation-exchange resins are A:-acidic B:-basic C:-neutral D:-none of these Correct Answer:- Option-A Question37:-In Chromatography `R\_f` value A:-`(text {Distance moved by the solute})/(text {Distance moved by the solvent})` B:-`(text {Distance moved by the solvent})/(text {Distance moved by the solute})`` C:-`(text {Distance moved by the solute})/(text {Distance moved by the solution})` D:-`(text {Distance moved by the solution})/(text {Distance moved by the solute})` Correct Answer:- Option-A

Question38:-In which of the following techniques the mobile phase is a gas?

A:-HPI C B:-GC C:-TLC D:-Ion-Exchange Chromatography Correct Answer:- Option-B Question39:-The shape of weak acid X strong base titration is A:-fig. B:-fig. C:-fig. D:-fig Correct Answer:- Option-A Question40:-The process of recovery of the constituents from the chromatogram is called A:-Dilution **B:-Elution** C:-Eluent D:-Recoveration Correct Answer:- Option-B Question41:-Iron-sulphur clusters in biological systems are involved in A:-proton transfer B:-atom transfer C:-group transfer D:-electron transfer Correct Answer:- Option-D Question42:-The metal present in carbonic anhydrase is A:-Mn B:-Zn C:-Ma D:-Cu Correct Answer:- Option-B Question43:-What is not true about Ferredoxins? A:-Involved in oxidation of ```"{NH 3}"` B:-Generate `"{H\_2}"` from acid solution C:-Reduction potential is from 0 to +0.5 V D:-It is Fe-S protein Correct Answer:- Option-C Question44:-Cytochromes acts as A:-Two electron transfer agents B:-One electron transfer agents C:-Multi electron transfer agents D:-None of these Correct Answer:- Option-B Question45:-Nitrogenase contains A:-Fe, Mo B:-Mg, Fe C:-Fe, Zn D:-Fe, Cu Correct Answer:- Option-A Question46:-fig. is an example for A:-Crown ether **B:-Calixarenes** C:-Catenene D:-Rotaxanes Correct Answer:- Option-A Question 47:-The interior of  $\beta$ -cyclodextrin is A:-hydrophobic **B:-hydrophilic** C:-hydrophobic and hydrophilic D:-none of these Correct Answer:- Option-B

Question48:-y-cyclodextrin (y-CD) contains A:-eight glucose units B:-seven glucose units C:-six glucose units D:-five glucose units Correct Answer:- Option-A Question49:-Calixarenes are synthetic compounds which are made by cyclooligomerization of A:-Amines **B:-Phenols** C:-Ketones D:-Amides Correct Answer:- Option-B Question50:-Macromolecules which are made up of two or more rings held together as links in a chain are called A:-Catenanes B:-Rotaxanes C:-Cyclodextrins D:-Calixarenes Correct Answer:- Option-B Question51:-fig A:-Chemoselective **B:-Regioselective C:-Enantioselective** D:-Diastereoselective Correct Answer:- Option-A Question52:-'Zeolites' is a broad term used to describe a family of minerals called A:-Trisilicates **B:-Pentasilicates** C:-Tetrasilicates D:-Tectosilicates Correct Answer:- Option-D Question53:-"Clayan" is a non-metallic oxidative green reagent composed of A:-Clay Supported Ammonium Nitrate **B:-Clay Supported Aluminium Nitrate** C:-Clay Supported Ammonium Nitrite D:-Clay Supported Aluminium Nitrite Correct Answer:- Option-A Question54:-The phosphorescence is due to the transition from A:-Singlet  $\rightarrow$  Singlet B:-Singlet  $\rightarrow$  Triplet C:-Triplet  $\rightarrow$  Singlet D:-Triplet  $\rightarrow$  Triplet Correct Answer:- Option-C Question55:-The quantum yield of photochemical chlorination of methane is A:-< 1 B:-1 C:-> 1 D:-0 Correct Answer:- Option-C Question56:-The potential for a hydrogen electrode of pH = 10 is \_\_\_\_\_\_. A:-0.00 V B:-0.591 V C:-+0.0591 V D:--0.0591 V Correct Answer:- Option-D

Question57:-Given `"E^0"` for half cell reactions `"E^0 {Zn^{2+}/Zn}" = -0.7618` `"{Vs SHE} "` " E^0 {Hg 2Cl 2/Hg}" = -0.2680` `"{Vs SHE}"` for the reaction `" text{Zn+Hg 2Cl 2} `->` text{ Zn^{2+} +2 Hg+2Cl^-" A:-(-0.2680 + 0.7618) V B:-(0.7680 V + 0.2680) V C:-(-0.7618 V + 0.2680) V D:-(-0.7618 V - 0.2680) V Correct Answer:- Option-B Question58:-Titration curve if a strong base is titrated with strong acid A:-fia B:-fig C:-fig D:-fig Correct Answer:- Option-C Question59:-Saturated solution if `"KNO\_3"` is used to make 'Salt bridge' becomes A:-Velocity of `"K^+"` is greater than that of `"NO^- 3"` B:-Velocity of `"NO^- 3"` is greater than that of `"K^+"` C:-Velocity of `"K^+"` and `"NO^- 3"` are nearly the same`` D:-`"KNO\_3"` is highly soluble in water Correct Answer:- Option-C Question60:-Which of the following decreases with increase in concentration? A:-Conductance **B:-Specific conductance** C:-Equivalent conductance D:-Molar conductance Correct Answer:- Option-B Question61:-Phosphofructokinase 2, a bifunctional enzyme can regulate glycolytic pathway. Which of the following statement is correct regarding this enzyme?

I. Kinase activity is active in their phosphorylated form

- II. Kinase activity is active in their dephosphorylated form
- III. Phosphatase activity is active in their phosphorylated form
- $\operatorname{IV.}\,$  Phosphatase activity is active in their dephosphorylated form
  - A:-I & III B:-I & IV
  - C:-II & III
  - D:-II & IV

Correct Answer:- Option-C

Question62:-Aspartate transcabamoylase is an example of allosteric enzyme and it contains 6 regulatory and 6 catalytic subunits. Which of the following is correct about his enzyme?

- I. ATP is an allosteric activator of this enzyme
- II. ATP is an allosteric inhibitor of this enzyme
- III. The subunit composition of ATCase is `"3C\_22R\_3"`
- IV. The subunit composition of ATCase is `"2C\_33R\_2"`
  - A:-I and III
  - B:-I and IV
  - C:-II and III
  - D:-II and IV
  - Correct Answer:- Option-B

Question63:-Gluconeogenesis pathway can produce glucose from noncarbohydrate precursors. This pathway occurs in which of the following sub cellular compartment/s?

- A:-Cytosol
- B:-Cytosol and mitochondria
- C:-Cytosol and endoplasmic reticulum

D:-Cytosol, mitochondria and endoplasmic reticulum

Correct Answer:- Option-D

Question64:-Thymidylate synthase catalyse the conversion of dUMP to dTMP, which of the following donate the methyl group?

A:-Methyl THF **B:-Methylene THF** C:-Formyl THF D:-SAM Correct Answer:- Option-B Question65:-Suppose the number of carbon rings in an "F 0/F 1" ATP synthase is 12. Then the value of P/O ratio for NADH, `"H^+"` and `"FADH\_2"` respectively are A:-2 and 1.2 B:-2.5 and 1.5 C:-3 and 2 D:-1.5 and 2.5 Correct Answer:- Option-A Question66:-Beta oxidation of a 20C saturated fatty acid to "CO 2" generate which of the following number of reductants? A:-8 NADH, `"H^+"` and 8 `"FADH 2" B:-9 NADH, `"H^+"` and 9 `"FADH 2"` C:-10 NADH, `"H^+"` and 10 `"FADH\_2"` D:-7 NADH, `"H^+"` and 7 `"FADH 2"` Correct Answer:- Option-B Question67:-Mixed inhibition and non-competitive inhibition are of two types of reversible inhibition. Which of the following is correct related to these inhibitions? A:-In both mixed inhibition and non-competitive inhibition `"V\_m\_a\_x"` decreases and Km increases B:-In mixed inhibition `"V m a x"` decreases and Km increases, in non-competitive inhibition `"V m a x"` decreases and Km unchanged C:-In both mixed inhibition and non-competitive inhibition `"V m a x"` and Km decreases D:-In mixed inhibition `"V m a x"` decreases and Km decreases, in non-competitive inhibition `"V m a x"` decreases and Km increases Correct Answer:- Option-B Question68:-Which of the following RNA molecule is NOT a ribozyme? A:-28S rRNA B:-5S rRNA C:-RNA part of RNase P D:-Hammer head RNA Correct Answer:- Option-B Question69:-Carbonic anhydrase enzyme catalyse the production of carbonic acid from water and "CO 2". Which of the following is correct related to this enzyme? A:-Carbonic anhydrase decreases the `"pK\_a"` value of water B:-Carbonic anhydrase increases the `"pK a"` value of water C:-`"K $^+$ "` is the cofactor of carbonic anhydrase D:-`"Ca $^2$ +"` is the cofactor of carbonic anhydrase Correct Answer:- Option-A Question70:-Which of the following is the ratio of phospholipid : sphingomyelin : cholesterol in a normal eukaryotic cell plasma membrane? A:-1:1:1 B:-1.5:0.5:1 C:-0.5:1.5:1 D:-1:0.5:1.5 Correct Answer:- Option-B Question71:-The absorption of ultraviolet (UV) light (the absorbance at 280 nm) is often used as a measure of protein concentration. The R-groups of which amino acids contribute most to absorption of 280 nm light? A:-Ser, Thr, Cys B:-Lys, Arg, His C:-Trp, Tyr, Phe D:-Ser, Ala, Glu Correct Answer:- Option-C

Question72:-In a eukaryotic cell plasma membrane, different phospholipid preferentially localized to either cytosolic side or exoplasmic side. Which of the following is the correct orientation of phospholipids like phosphatidyl choline and phosphatidyl inositol in cytosolic and exoplasmic side?

A:-Both are cytosolic B:-Both are exoplasmic C:-Phosphatidyl choline is localized to cytosolic and phosphatidyl inositol is localized to exoplasmic D:-Phosphatidyl inositol is localized to cytosolic and phosphatidyl choline is localized to exoplasmic Correct Answer:- Option-D Question73:-Which of the following cyclin is responsible to activate CDK4 and CDK6 to pass the cell cycle from G1 phase? A:-Cyclin A B:-Cyclin B C:-Cyclin D D:-Cyclin E Correct Answer:- Option-C Question74:-Which of the following transposons is an example of non autonomous transposon? A:-Ac elements in maize B:-Ds elements in maize C:-P elements in drosophila D:-IS elements in bacteria Correct Answer:- Option-B Question75:-`"Na^+/K^+"` pump utilize ATP hydrolysis to pump  $3"Na^+$ "` to the extracellular side and 2 `"K^+"` to the intracellular side and generate an electric potential to the cell. This pump belong to A:-F type pump B:-V type pump C:-P type pump D:-ABC type pump Correct Answer:- Option-C Question76:-Which monomeric G proteins are involved in the formation of filopodium, lamellipodium and stress fibers? A:-Filopodium - cdc42, Lamellipodium - Rac, Stress fibers - Rho B:-Filopodium - Rac, Lamellipodium - cdc42, Stress fibers - Rho C:-Filopodium - Rho, Lamellipodium - Rac, Stress fibers - cdc42 D:-None of the above Correct Answer:- Option-A Question77:-Apoptosis (programmed cell death) executed by the action of caspase enzyme in intrinsic and extrinsic pathway of apoptosis. Which of the following caspase is involved in intrinsic pathway of apoptosis? A:-Proteolytic cleavage of procaspase to caspase 9 B:-Dimerisation of procaspase to caspase 9 C:-Proteolytic cleavage of procaspase to caspase 8 D:-Dimerisation of procaspase to caspase 8 Correct Answer:- Option-B Question78:-Which of the following ligand and receptor correctly matches? A. Epinephrine - (i) HER (RTK) B. EGF - (ii) Frizzled C. Bacteria - (iii) GPCR D. Wnt - (iv) TLR A:-A - iii, B - i, C - iv, D - ii B:-A - ii, B - iii, C - iv, D - i C:-A - iii, B - iv, C - i, D - ii D:-A - iv, B - i, C - iii, D - ii Correct Answer:- Option-A Question79:-Replication in both prokaryotes and eukaryotes occur only in 5'  $\rightarrow$  3' direction. Which of the following reason for that? A:-Primer addition is not possible

B:-Okazaki fragments not possible

C:-Leading strand synthesis is not possible

D:-Proofreading is not possible

Correct Answer:- Option-D

Question80:-Which of the following protein are involved in the development of dorsal side of the embryo?

A:-Decapentaplegic and tolloid

B:-Dorsal and fgf 8

C:-Bicoid and hunchback D:-Nanos and Caudal Correct Answer:- Option-A Question81:-Which of the following photosystem locate in the appressed (stalked) portion of thylakoid membrane? A:-Photosystem I **B:-Photosystem II** C:-Cyt bf complex D:-Light harvesting complex I Correct Answer:- Option-B Question82:-Which of the following RNA polymerase is involved in the synthesis of RNA part of `"U 6"` spliceosome? A:-RNA polymerase I **B:-RNA** polymerase II C:-RNA polymerase III D:-RNA polymerase IV Correct Answer:- Option-C Question83:-Plant secondary metabolite flavonoids are derived from the amino acid phenylalanine. Which of the following is the precursor of flvaonoids synthesizing pathway? A:-Chorismate B:-Enol pyruvate shikimate pathway C:-Prephenate D:-Chalcone Correct Answer:- Option-D Question84:-Which of the following amino acid use a single codon for the translation of proteins in humans? A:-Alanine **B:-Histidine** C:-Valine D:-Tryptophan Correct Answer:- Option-D Question85:-Which of the following secondary metabolite is used as an anticancer drug derived from the bark of Yew trees? A:-Camptothecin **B:-Taxol** C:-Cochicine D:-Vincristine Correct Answer:- Option-B Question86:-Which of the following plant hormone is responsible for the formation of guiescent centre in root apical meristem? A:-Auxin **B:-Cytokinin** C:-Gibberlin D:-Ethylene Correct Answer:- Option-A Question87:-Which of the following operon use its regulatory gene product as a transcriptional activator and repressor? A:-Lac operon **B:-Galactose operon** C:-Arabinose operon D:-Tryptophan operon Correct Answer:- Option-C Question88:-Which of the following compound is elevated in response to plant experience a water stress? A:-Myoinositol **B:-Galactinol** C:-Raffinose D:-Proline betaine Correct Answer:- Option-D Question89:-Which of the following repair system use blue light energy to correct the errors? A:-Direct repair B:-Nucleotide excision repair C:-Mismatch repair D:-Recombination repair Correct Answer:- Option-A

Question90:-Glycoproteins A:-contain oligosaccharides linked to the side chain of lysine or histidine residues B:-contain oligosaccharides linked to the side chain of asparagine, serine, or threonine residues C:-bind to liver cell-surface receptors that recognize sialic acid residues D:-are mostly cytoplasmic proteins Correct Answer:- Option-B Question91:-Which of the following is an example of a restriction site that shows two-fold rotational symmetry? A:-ATTA **B:-ATAATA** C:-ATAT D:-ATTTTA Correct Answer:- Option-C Question92:-A deficiency in which of the following amino acids will result in the negative nitrogen balance, even though the diet may contain a large amount of protein A:-Alanine **B:-Serine** C:-Glutamate D:-Tryptophan Correct Answer:- Option-D Question93:-Which of the following binding interactions is likely to be the most important initial interaction when a drug enters a binding site? A:-Van der Waals interactions B:-Hydrogen bond C:-Ionic D:-Induced dipole-dipole interactions Correct Answer:- Option-C Question94:-During photosynthesis, which of the followings acts as a reservoir for hydrogen ions? A:-Cristae B:-Stroma C:-Thylakoid space D:-Matrix Correct Answer:- Option-C Question95:-Maple syrup urine disease is a deficiency of which amino acid degradative pathway? A:-Tvrosine **B:-Leucine** C:-Tryptophan D:-Arginine Correct Answer:- Option-B Question96:-The light microscope that is often used to view internal structures of living cells without staining is A:-Dark-field microscope B:-Bright-field microscope C:-Fluorescence microscope D:-Phase-contrast microscope Correct Answer:- Option-D Question97:-You wish to prepare a 10 µM solution of a protein of molecular weight 10,000. Which of the following statement is most incorrect? A:-Weigh out 10 mg and dissolve it in 100 ml of solution B:-Weigh out 0.1 g and dissolve it in 1 litre of solution C:-Weigh out mg and dissolve it in 5 ml solution, then dilute this solution tenfold D:-Weigh out 0.02 g and dissolve it in 20 ml of solution, then dilute this solution 2 fold Correct Answer:- Option-D Question98:-Which of the following medium is used to select the heterokaryon hybridoma cell in hybridoma technology? A:-Hydroxy urea, aminopterine, thymidine B:-Hypoxanthine, acetaminophen, thymidine C:-Hypoxanthine, aminopterine, thiourea D:-Hypoxanthine, aminopterine, thymidine Correct Answer:- Option-D Question99:-An example of inactivated exotoxin A:-Cholera vaccine **B:-Rabies vaccine** 

C:-Hepatitis B vaccine D:-Rubella vaccine Correct Answer:- Option-C Question100:-Polyacrylamide and agarose gel electrophoresis separate nucleic acids based primarily on their A:-Length B:-Ratio of mass/charge C:-(G+C)/(A+T) content D:-Organismal origin Correct Answer:- Option-A