

PREVIEW QUESTION BANK

Module Name : SCPH20 Nano Sciences - ENG
Exam Date : 30-Oct-2023 Batch : 09:30-12:30

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negativ Marks
Objective Question				
1	986001	The mission objectives of Chandrayaan-3 includes: A. To demonstrate Rover roving on the moon B. To demonstrate a Safe and Soft Landing on Lunar Surface C. To conduct <i>in-situ</i> scientific experiments on the chemical and natural elements, soil, water, etc. available on the surface of the Moon D. To better understand and practice the composition of the Moon With reference to the above, which of the following are correct? 1. A, B, C and D 2. A, C and D only 3. A, B and C only 4. B, C and D only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
2	986002	How many countries are now members of the G-20? 1. 19 countries, the European Union and the African Union 2. 23 countries, the European Union and the African Union 3. 22 countries, the European Union and the African Union 4. 24 countries and the European Union A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
3	986003		4.0	0.00

Match List I with List II

LIST I		LIST II	
A.	Reflection	I.	Light passing from one medium to another is bent at an angle
B.	Transmission	II.	Light bounces back off surface of an object
C.	Refraction	III.	Light is captured inside of object
D.	Absorption	IV.	Light passes directly through object
E.	Fluorescence	V.	Light changes to a different wavelength

Choose the correct answer from the options given below:

1. A-II; B-IV; C-I; D-III; E-V
2. A-IV; B-II; C-III; D-I; E-V
3. A-V; B-III; C-I; D-IV; E-II
4. A-I; B-II; C-III; D-IV; E-V

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

4	986004	Which one of the following is an indication for the quality of a research journal? 1. Impact factor 2. h-index 3. g-index 4. i10-index A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

5	986005	Cobalt-60 is used in the radiation therapy of cancer and can be produced by bombardment of cobalt-59 with : 1. Neutrons 2. Alpha particles 3. Beta particles 4. X-rays A1 : 1 A2 : 2 A3 : 3	4.0	0.00
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		A4 : 4		
Objective Question				
6	986006	Which of the following is not a function of the Output Unit of computer? 1. It produces results that can be easily understood by the user. 2. It accepts the results produced by the computer. 3. It supplies the data and instructions to the outside world. 4. It supplies the data and instructions to the computer for further processing. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
7	986007	VDU stands for _____ . 1. Virtual Display Unit 2. Visual Display Unit 3. Virtual Detection Unit 4. Visual Detection Unit A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
8	986008	When an algorithm is written in the form of a programming language, it becomes a: 1. Flowchart 2. Program 3. Pseudo code 4. Syntax A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
9	986009		4.0	0.00

		Which of the following is not a characteristic of a computer? 1. Versatility 2. Accuracy 3. Diligence 4. I.Q. A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

10	986010	Which of the following tools is best for presenting data to a group? 1. Excel sheet 2. Power point presentation 3. Word Document 4. Printer A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

11	986011	A research paper is a brief report of research work based on 1. Primary Data only 2. Secondary Data only 3. Neither Primary nor Secondary Data 4. Both Primary and Secondary Data A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

12	986012		4.0	0.00
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		According to second Law of thermodynamics, if process occurs in a closed system, entropy of system will remain constant for 1. random process 2. irreversible process 3. reversible process 4. linear process A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

13	986013	Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called: 1. Alternative hypothesis 2. Null hypothesis 3. Statistical hypothesis 4. Composite hypothesis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

14	986014	Which of the following statements are NOT true for Scanning Electron Microscopy? 1. Scanning electron microscopy is a microscopy technique in which a beam of electrons is transmitted through a specimen to form an image. 2. Images of a sample are produced by scanning the surface with a focused beam of electrons. 3. The electron beam is scanned in a raster scan pattern and the position of the beam is combined with the intensity of the detected signal to produce an image. 4. Electrons interact with atoms in the sample, producing signals that contain information about the surface topography and composition. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

15	986015		4.0	0.00
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		With very large population of vehicular traffic in Indian cities, which of the following steps can reduce the vehicular pollution in the cities? A. Switching over the entire fleet of public transport i.e. buses, autorickshaws from petrol and CNG to diesel B. Phasing out old vehicles C. Use of unleaded petrol in vehicles D. Application of stringent pollution level norms for vehicles E. Use of catalytic converters in vehicles Select the most appropriate code from the options below: 1. A, B and C only 2. A, B, C and D only 3. A, C, D and E only 4. B, C, D and E only A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

16	986016	Which of the following cannot be patented? 1. machine 2. process 3. compound or composition of matter 4. natural products A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

17	986017	Newton gave three basic laws of motion. This research is categorized as 1. Descriptive Research 2. Fundamental Research 3. Sample Survey 4. Applied Research A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

18	986018	Which of the following has the same format as thesis writing? 1. Preparation of a research paper/article 2. Writing of seminar presentation 3. Presenting a workshop/conference paper 4. A research dissertation A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

19	986019	In the process of conducting research, Hypothesis Formulation is followed by: 1. Statement of Objectives 2. Selection of Research Tools 3. Data Analysis 4. Data Collection A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

20	986020	Research problem is selected from the standpoint of 1. Financial support 2. Researcher's interest 3. Social relevance 4. Availability of relevant literature A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

21	986021		4.0	0.00
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		The ozone layer is present in _____ 1. Mesosphere 2. Thermosphere 3. Stratosphere 4. Troposphere A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

22	986022	The normal range of blood pressure in a human being is _____ 1. 160/80 mm Hg 2. 120/90 mm Hg 3. 120/80 mm Hg 4. 130/80 mm Hg A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

23	986023	The final stage of research process is 1. Problem formulation 2. Data collection 3. Report writing 4. Data analysis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

24	986024		4.0	0.00
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		Which of the following is not E-journal database? 1. PubChem 2. PubMed 3. Microsoft Edge 4. Science Direct A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

25	986025	The process in which proton gets converted in to neutron by emitting positron and neutrino is known as _____ 1. $\beta +$ decay 2. $\beta -$ decay 3. $\gamma +$ decay 4. $\gamma -$ decay A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

26	986026	What is the purpose of research aptitude test for candidates appearing for PhD entrance? 1. to increase the difficulty level of the test 2. to develop a scientific approach in the aspiring candidates 3. to identify and screen candidates with scientific approach and aptitude 4. to provide the candidates about a basic idea of research A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

27	986027		4.0	0.00
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		During Transmission Electron Microscopy (TEM), a vacuum is created inside the _____ 1. room of operation 2. specimen 3. ocular system 4. column A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

28	986028	Which of the following is true based on the strength of the bond? 1. Ionic > van der Waal > Covalent 2. Covalent > Ionic > van der Waal 3. van der Waal > Ionic > Covalent 4. Ionic > Covalent > van der Waal A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

29	986029	In Gas-liquid phase chromatography, the stationary phase is composed of _____ and the mobile phase is made of _____ 1. Solid, liquid 2. Liquid, gas 3. Liquid, liquid 4. Solid, gas A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

30	986030		4.0	0.00
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		NMR is the study of the absorption of _____ by nuclei in a magnetic field. 1. Radioactive radiation 2. IR radiation 3. Microwaves 4. Radio frequency radiation A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

31	986031	Which of the following analytical method is used to measure the analyte concentration depending on the quantity of light received by the analyte? 1. Potentiometry 2. Decantation 3. Spectroscopy 4. Chromatography A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

32	986032	Which of the following pairs represent an infectious and a non-infectious disease respectively? 1. Typhoid and AIDS 2. AIDS and Cancer 3. Pneumonia and malaria 4. Cancer and malaria A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

33	986033		4.0	0.00
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		Consider the following statements A. When a virus does not change, it is called a mutation. B. A virus with one or more new mutations is known as a “variant” of the original virus. Which of the following statements is/are correct? 1. Only A 2. Only B 3. Both A and B 4. Neither A nor B A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

34	986034	Which of the following is NOT an intellectual property as per IPR Laws ? 1. Original literary work 2. Industrial Designs of Maruti cars 3. Trademark of Tata company 4. Newton's Laws of Motion A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

35	986035	Mass spectrometers are used to determine which of the following? 1. composition in sample 2. concentration of elements in sample 3. properties of sample 4. relative mass of atoms A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

36	986036		4.0	0.00
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		DVD technology uses an optical media to store the digital data. DVD is an acronym for 1. Digital Vector Disc 2. Digital Volume Disc 3. Digital Versatile Disc 4. Digital Visualization Disc A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

37	986037	In an experiment, the researcher manipulates one or more variables in an attempt to determine its effect on the 1. Dependent variable 2. Independent variable 3. Treatment 4. Test variable A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

38	986038	One nm is equal to : 1. 10^{-10} cm 2. 10^{-9} cm 3. 10^{-8} cm 4. 10^{-7} cm A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

39	986039		4.0	0.00
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		The _____ feature of MS Excel quickly completes a series of data. 1. Auto complete 2. Auto fill 3. Fill Handle 4. Sorting A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

40	986040	Evaluation Research is concerned with _____ 1. How well are we doing? 2. Why are we doing? 3. What are we doing? 4. Writing for fund support. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

41	986041	An image, perception or concept that can be measured in research is called 1. Scale 2. Hypothesis 3. Variable 4. Type A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

42	986042		4.0	0.00
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		Research is _____ 1. Searching again and again 2. Working in a scientific way to search the truth of any problem 3. Finding somehow solution to any problem 4. Working in non-concrete way to solve a problem A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

43	986043	gif, jpeg, bmp, png, tiff are used as extensions for files which store: 1. audio data 2. video data 3. image data 4. text data A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

44	986044	Electron microscope can give a magnification up to 1. 100X 2. 100,000X 3. 15000X 4. 400,000X A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

45	986045		4.0	0.00
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		Which one among the following variables cannot be expressed in quantitative terms? 1. Numerical Aptitude 2. Professional Attitude 3. Marital Status 4. Socio-economic Status A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

46	986046	An abstract represents which of the following? 1. Quotations related to the research 2. Glossary for the research 3. Bibliography for the research 4. Brief summary of the research A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

47	986047	A detailed disclosure on the subject under study/ research is called : 1. Book 2. Research Abstract 3. Thesis or Dissertation 4. Research Summary A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

48	986048		4.0	0.00
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		Which of the following is a measure of consistency of data? 1. Mean 2. Standard deviation 3. Mode 4. Median A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

49	986049	The term PVC used in the plastic industry stands for : 1. Polyvinyl chloride 2. Polyvinyl carbonate 3. Phosphor vanadium chloride 4. Phosphaviny chloride A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

50	986050	A Blue print of Research work is called 1. Research Problem 2. Research design 3. Research tools 4. Research methods A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

51	986051		4.0	0.00
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In non-competitive inhibition of enzymes,

- A. Inhibitor chemically does not resemble the substrate molecule but reacts with bulk of enzyme reducing access to active site.
- B. Inhibitor chemically resembles the substrate molecule and is able to block the active site.
- C. At low concentration of inhibitor, increasing concentration of substrate cannot prevent binding of inhibitor and some inhibition remains even at high substrate concentration.
- D. An example is alanine non-competitively inhibits pyruvate kinase.

With reference to the above, which of the following are correct?

- 1. A, B, C, D
- 2. A, C, D only
- 3. B, C, D only
- 4. A, B, C only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

52	986052	The Michaelis-Menten constant (K_m) is A. The substrate concentration that sustains double maximum velocity ($2 V_{max}$) of an enzyme-catalyzed reaction. B. It is not a measure of the degree of affinity of an enzyme for its substrate. C. K_m cannot be measured experimentally. D. Values of K_m have been measured for a great many enzymes and shown that some enzymes are able to work at maximum velocity at very low concentration of substrate. With reference to the above, which of the following are incorrect? 1. A, B, C, D 2. A, B, C only 3. B, C, D only 4. A, C, D only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

53	986053		4.0	0.00
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Read the following statements about active transport.

- A. In active transport, metabolic energy produced by the cell and held as ATP drives the transport of molecules and ions across the membrane.
- B. Active transport is a feature of most living cells.
- C. Active uptake is the free passage of molecules and ions from a region of high concentration to low concentration.
- D. Active transport involves special membrane protein pumps traversing the lipid bilayer and requires ATP for transport.

With reference to the above, which of the following are correct?

- 1. A, B, C, D
- 2. A, B, D only
- 3. B, C, D only
- 4. A, B, C only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

54	986054	Read the following statements about mitosis. A. In telophase, a nuclear envelope forms around both groups of chromosomes at opposite ends of the cell. B. In prophase, the chromosomes become visible as long thin threads. C. In metaphase, the two centrosomes move to opposite ends of the cell and microtubules of the cytoplasm start to form spindle, radiating out from centrioles. D. In anaphase, the centromeres separate, the spindle fibres shorten and the chromatids are pulled by their centromeres to opposite poles. With reference to the above, which of the following are correct? 1. A, B, C, D 2. A, B, D only 3. B, C, D only 4. A, B, C only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

55	986055		4.0	0.00
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Read the following statements.

- A. Meselson and Stahl discovered the existence of DNA double helix.
- B. Erwin Chargaff produced X-ray diffraction by bombarding crystalline DNA with X-rays.
- C. Franklin and Wilkins measured exact amount of four organic bases in samples of DNA and found the ratio of A:T and of C:G was always close to 1.
- D. The confirmation that DNA is replicated semi-conservatively was experimentally demonstrated by Crick and Watson for which they were awarded Nobel Prize.

With reference to the above, which of the following are incorrect?

- 1. A, B, C, D
- 2. A, B, C only
- 3. A, B, D only
- 4. B, C, D only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

56	986056	Read the following statements on the salient features of genetic code. A. Code is triplet where 60 codons code for amino acids and 4 codons do not code for any amino acids and function as stop codons. B. Some amino acids are coded by more than one codon, hence code is degenerate. C. The codon is different from bacteria to human. D. AUG, UAA, UAG and UGA are stop terminator codons. With reference to the above, which of the following are incorrect? 1. A, B, C, D 2. A, B, C only 3. A, B, D only 4. A, C, D only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

57	986057		4.0	0.00
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Read the following statements on structure of DNA.

- A. Two long polynucleotide chains are coiled around a central axis forming left handed helix.
- B. The two chains are parallel and their C-5' to C-3' orientation run in opposite directions.
- C. Each complete turn of the helix is 2.4 nm long and double helix has a diameter of 3 nm.
- D. Nitrogenous bases of opposite chains are paired through hydrogen bonds in DNA double helix.

With reference to the above, which of the following are incorrect?

- 1. A, B, C only
- 2. A, B, D only
- 3. A, B, D only
- 4. A, B, C, D

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

58	986058	Read the following statements. A. In Creutzfeldt-Jacob disease, β chains of hemoglobin are altered as a result of single amino acid change. B. In sickle cell anemia, mutation alters the PrP amino acid sequence leading to prion formation. C. Huntington disease is inherited as an autosomal recessive trait. D. Alzheimer disease and Parkinson disease are linked to formation of abnormal protein aggregates in the brain. With reference to the above, which of the following are incorrect? 1. A, B, C only 2. A, B, D only 3. A, C, D only 4. A, B, C, D A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

59	986059		4.0	0.00
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		Read the following statements on cardiovascular disease. A. Damage or infection smoothen the inner lining of arteries and lead to antherosclerosis which is softening of arteries by fat accumulation. B. Cholesterol is a key player in the development of antherosclerosis. C. High Density Lipoprotein (HDL) delivers cholesterol to cells for membrane production. D. Low Density Lipoprotein (LDL) scavenges excess cholesterol for return to liver. With reference to the above, which of the following are incorrect? 1. A, B, C only 2. A, B, D only 3. A, C, D only 4. A, B, C, D A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

60	986060	Small/ short interfering RNA (siRNA) is a commonly used RNA tool that causes: 1. Duplication of protein encoding genes. 2. Deletion of protein encoding genes. 3. Permanent silencing of protein coding genes. 4. Short-term silencing of protein coding genes. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

61	986061	Which of the following statements about HIV is incorrect? 1. HIV is an enveloped retrovirus. 2. HIV infects T-cell that carry the CD4 antigen on the surface. 3. HIV contains two copies of negative strand RNA genome. 4. HIV-I need co-receptors CCXR4/CCR5 for entry into host cell. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

62

986062

4.0

0.00

Some cellular and extracellular proteins are listed in Column A and their typical characteristics are listed in Column B.

Column I		Column II	
A.	Nidogen	I.	In human genome, one gene of this protein is present but many different isoforms exist due to alternative splicing.
B.	Fibronectin	II.	An intermediate filament protein that is typically expressed in epithelial and mesenchymal cells.
C.	Integrin	III.	One of the principal structural proteins of basal laminae.
D.	Vimentin	IV.	Heterodimer of α and β subunit and binds to extracellular matrix proteins.

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV

2. A-II, B-III, C-IV, D-I

3. A-III, B-I, C-IV, D-II

4. A-II, B-IV, C-I, D-III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

63	986063	$\text{Na}^+ - \text{K}^+$ ATPase exchanges Na^+ and K^+ across cell membrane. The enzyme is a 1. Tetramer and consumes two ATP molecules in every cycle. 2. Dimer and consumes twoox ATP molecule in every cycle. 3. Monomer and consumes one ATP molecule in every cycle. 4. Tetramer and consumes one ATP molecule in every cycle. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

64	986064		4.0	0.00
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Given below are two sets of terms related to various methods used in biological science in Column A and Column B.

Column I		Column II	
A.	RACE	I.	DNA-protein interaction
B.	South-Western blotting	II.	FAM
C.	Recursive PCR	III.	Determining the ends of mRNA
D.	TaqMan	IV.	Construction of synthetic DNA

Choose the correct answer from the options given below:

1. A-IV, B-III, C-I, D-II
2. A-III, B-I, C-IV, D-II
3. A-II, B-IV, C-I, D-III
4. A-II, B-I, C-IV, D-III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

65

986065

4.0

0.00

There are number of specific T cell surface molecules involved in various functions of adaptive immune response. Column A represents a list of T cell surface molecules and Column B represents possible functional characteristics.

Column I		Column II	
A.	T cell receptor	I.	Binds to CD 40 on B cells and APCs and triggers activation of APCs and activation/ differentiation of B cells.
B.	CD 28	II.	Binds to MHC class I molecules and restricts T cytotoxic cells to recognizing only peptide presented on MHC class I.
C.	CD 8	III.	Binds to B7-1,2 on CD 80/86 on B cells and APCs, which triggers T cell activation.
D.	CD 154	IV.	Consists of two polypeptide chains α and β and some consist of polypeptide chains γ and δ .

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-IV, B-I, C-II, D-III
3. A-III, B-IV, C-I, D-II
4. A-IV, B-III, C-II, D-I

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

66	986066		4.0	0.00
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Why does recombination between linked genes continue to occur?

1. Recombination is a requirement for independent assortment.
2. Recombination must occur or genes will not assort independently.
3. New allele combinations are acted upon by natural selection.
4. The forces on the cell during meiosis II always result in recombination.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

67 986067

Match the components in Column A with Column B.

Column I		Column II	
A.	Rhodopsin	I.	Vitamin C
B.	Tocopherol	II.	Vitamin A
C.	Isoflavonoids	III.	Vitamin E
D.	Ascorbic acid	IV.	Soyabean

Choose the correct answer from the options given below:

1. A-I, B-II, C-IV, D-III
2. A-II, B-I, C-IV, D-III
3. A-II, B-III, C-IV, D-I
4. A-IV, B-III, C-II, D-I

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

68 986068

Which of the following statements about the activation of B cells is correct?

1. B cells have "T" shaped antigen receptors on their surface.
2. B cells do not have a memory cell form, so their response to a second infection by a pathogen is no different than the first.
3. To start proliferating, B cells usually need to be activated by both an antigen and the cytokine interleukin-2.
4. Activated B cells kill bacteria by phagocytosis.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

69

986069

Match the cancer types (Column A) with cancer related descriptions (Column B).

4.0

0.00

Column I		Column II	
A.	Leukemia	I.	A tumor that has arisen from endodermal tissue
B.	Sarcoma	II.	Hematopoietic cell cancer that does not grow as a solid tumor
C.	Carcinoma	III.	A tumor that develops from mesodermal connective tissue
D.	Melanoma	IV.	Cancer that develops from the pigment producing cells of skin

Choose the correct answer from the options given below:

1. A-II, B-III, C-I, D-IV

2. A-IV, B-I, C-III, D-II

3. A-I, B-III, C-II, D-IV

4. A-II, B-I, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

70

986070

Match the sub-cellular organelles (Column A) with their associated functions (Column B).

4.0

0.00

Column I		Column II	
A.	Nucleolus	I.	Glycoprotein biosynthesis
B.	Peroxisome	II.	Oxidation of fatty acids and amino acids
C.	Endoplasmic reticulum	III.	Protein trafficking
D.	Golgi bodies	IV.	Ribosome biogenesis

Choose the correct answer from the options given below:

1. A-III, B-II, C-I, D-IV

2. A-I, B-II, C-III, D-IV

3. A-IV, B-II, C-I, D-III

4. A-II, B-III, C-I, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

71	986071		4.0	0.00
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In the enzyme linked antibody used in ELISA, the interaction between the enzyme and antibody is stabilized by

1. Hydrogen bonds only
2. Ionic bond only
3. Covalent bond only
4. van der Waal interactions only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

72	986072	Read the following statements about eukaryotic cell cycle. A. CDKs can phosphorylate proteins in the absence of cyclins. B. CDKs can be inactivated by phosphorylation. C. Degradation of cyclins is required for cell cycle progression. D. CDKs are not involved in chromosome condensation. Which of the following statements are correct? 1. A and C only 2. A and D only 3. A, B and C only 4. B and C only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

73	986073	Match the components of Column A with those in Column B. <table><tr><th colspan="2">Column I</th><th colspan="2">Column II</th></tr><tr><td>A.</td><td>Idiopathic thrombocytopenic pupura</td><td>I.</td><td>Thyroid</td></tr><tr><td>B.</td><td>Hashimoto's disease</td><td>II.</td><td>Gut</td></tr><tr><td>C.</td><td>Celiac disease</td><td>III.</td><td>Brain</td></tr><tr><td>D.</td><td>Huntington disease</td><td>IV.</td><td>Platelets</td></tr></table> Choose the correct answer from the options given below: 1. A-I, B-III, C-II, D-IV 2. A-II, B-I, C-IV, D-III 3. A-III, B-IV, C-II, D-I 4. A-IV, B-I, C-II, D-III A1 : 1	Column I		Column II		A.	Idiopathic thrombocytopenic pupura	I.	Thyroid	B.	Hashimoto's disease	II.	Gut	C.	Celiac disease	III.	Brain	D.	Huntington disease	IV.	Platelets	4.0	0.00
Column I		Column II																						
A.	Idiopathic thrombocytopenic pupura	I.	Thyroid																					
B.	Hashimoto's disease	II.	Gut																					
C.	Celiac disease	III.	Brain																					
D.	Huntington disease	IV.	Platelets																					

		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

74	986074	Which of the following statements regarding immunoglobulins is false? 1. The constant regions determine the “class” of the antibody. 2. Immunoglobulins consist of four polypeptide chains. 3. Polypeptide chains in immunoglobulins are held together by disulfide bonds. 4. The antigen binding sites on an immunoglobulin are different and allow binding to two different antigens. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

75	986075	With regard to p53 tumor suppressor gene, which of the following statement is false? 1. It is located on chromosome 17. 2. It encodes 53 kDa protein. 3. It holds the cell cycle in the G1 phase. 4. Both copies of gene must be mutated for loss of function. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

76	986076		4.0	0.00
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In order to visualize the intracellular organization of a cell, one can utilize various microscopy based techniques. These include:

- A. Differential interference contrast (DIC) microscopy.
- B. Phase contrast microscopy.
- C. Dark field microscopy.
- D. Epifluorescence microscopy.
- E. Scanning electron microscopy.
- F. Transmission electron microscopy.
- G. Confocal microscopy.

Which of the following microscopes can be used to study the intracellular dynamics using live cell imaging?

- 1. A, B, E, F and G only
- 2. A, B, C, D and G only
- 3. A, D, E, F and G only
- 4. C, D, E, F and G only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

77	986077	The minimum inhibitory concentration (MIC) of an antibiotic X against <i>Clostridium tetani</i>, <i>Staphylococcus spp.</i>, <i>Shigella spp.</i> and <i>Streptococcus spp.</i>, is 25, 15, 2 and 1 µg/ml. Which of the following bacteria may develop resistance against X in the animal model? 1. <i>Clostridium tetani</i> 2. <i>Staphylococcus spp.</i> 3. <i>Shigella spp.</i> 4. <i>Streptococcus spp.</i> A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

78	986078	RNAs that catalyze biological reactions such as self-splicing introns, are known as: 1. Micro RNAs 2. Ribozymes 3. Spliceozymes 4. Small nucleolar RNAs A1 : 1 A2 : 2 A3 : 3	4.0	0.00
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A4 : 4

Objective Question

79	986079	Which of the following factor is non-functional in Royal haemophilia? 1. Anti-haemophilic factor A (VIII) 2. Stuart-Prower factor (X) 3. Hageman factor (XII) 4. Christmas factor (IX) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

80

986080

Match the scientists in Column A with their major contribution in Column B.

4.0

0.00

Column I		Column II	
A.	Antonie van Leeuwenhoek	I.	Taxonomy
B.	Carl Linnaeus	II.	Antimicrobial Agents
C.	Sir Alexander Fleming	III.	Vaccination
D.	Louis Pasteur	IV.	Microscopy

Choose the correct answer from the options given below:

1. A-IV, B-II, C-I, D-III

2. A-IV, B-I, C-II, D-III

3. A-I, B-IV, C-III, D-II

4. A-II, B-I, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

81	986081	What is O-linked glycosylation? 1. The modification of carbohydrates that are attached to Asparagines in the Golgi. 2. The phosphorylation of mannoses in the Golgi. 3. The addition of carbohydrates to serines or threonines in the Golgi. 4. The phosphorylation of carbohydrates in the ER. A1 : 1 A2 : 2	4.0	0.00
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		A3 : 3		
		A4 : 4		

Objective Question

82	986082	Membrane rafts are enriched in: 1. Cholesterol and sphingolipids 2. Cholesterol and phospholipids 3. Glycolipids and phospholipids 4. Sphingolipids and phospholipids A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

83	986083	Which of the following leukocytes are present in the largest proportion in healthy human blood? 1. Neutrophils 2. Eosinophils 3. Basophils 4. Monocytes A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

84	986084	Oxytocin and antidiuretic hormone are synthesized in : 1. Hypothalamus 2. Adenohypophysis 3. Anterior pituitary 4. Posterior pituitary A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

85	986085	The oral polio vaccine (OPV) consists of : 1. Live attenuated virus 2. Killed virus 3. Viral toxin 4. Viral capsid subunit A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
86	986086	What is the correct order of staining reagents in Gram-Staining? 1. Crystal violet, alcohol, iodine solution, safranin 2. Crystal violet, iodine solution, alcohol, safranin 3. Crystal violet, safranin, alcohol, iodine solution 4. Iodine solution, crystal violet, alcohol, safranin A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
87	986087	Given below are few statements with references to blood clot formation which results from triggered chain of reactions: A. Conversion of fibrinogen to fibrin. B. Activation of factor XIII, which stabilizes fibrin mesh work. C. Activation of factor XII, which promotes plasmin activation. D. Enhancement of platelet aggregation. Which one of the following combination of statements is correct with reference to roles of thrombin in hemostasis? 1. B, C and D only 2. A, B and D only 3. A, C and D only 4. A, B and C only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question

88	986088	The ABO blood group is based on two glycolipid antigens called A and B. Read the following statements. A. Individuals with A blood group have anti-B antibody in plasma and compatible donor blood types for these individuals are A and O. B. Individuals with B blood group have anti-A antibody in plasma and compatible donor blood types for these individuals are B and O. C. Individuals with AB blood group have both anti-A and anti-B antibodies in plasma and compatible donor blood types for these individuals are A, B, AB and O. D. Individuals with O blood group have neither anti-A nor anti-B antibody in plasma and compatible donor blood type for these individuals is only O. Select the CORRECT option. 1. A and B only 2. B and D only 3. A, B and C only 4. A, B, C and D A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

89986089

In which of the following options hormone is not matching with its source and function?

4.00.00

1.

Hormone	Source	Function
Glucocorticoids	Adrenal cortex	Produces anti-inflammatory reactions

2.

Hormone	Source	Function
Vasopressin	Posterior pituitary	Stimulates resorption of water and electrolytes

3.

Hormone	Source	Function
Parathyroid hormone	Thyroid	Decreases the blood Ca^{2+} level

4.

Hormone	Source	Function
Melatonin	Pineal gland	Maintains sleep-wake cycle

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

90	986090		4.0	0.00
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Match the components in Column A with those in Column B.

Column I		Column II	
A.	Methylation of lys	I.	Collagen structure
B.	Hydroxylation of proline	II.	Activates gene by modifying histones in chromatin
C.	Phosphorylation of Tyr	III.	Targets protein degradation
D.	Poly-ubiquitination of Lys	IV.	Cell signaling

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-I, B-III, C-IV, D-II
3. A-II, B-I, C-III, D-IV
4. A-II, B-I, C-IV, D-III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

91 986091

Match Column I with Column II and select the correct option from codes given below:

Column I		Column II	
A.	Sporozoites	I.	Infectious form of Plasmodium
B.	Filariasis	II.	Aedes mosquitoes
C.	Typhoid	III.	Wuchereria
D.	Chikungunya	IV.	Widal test

Choose the correct answer from the options given below:

1. A-IV, B-II, C-I, D-III
2. A-III, B-IV, C-II, D-I
3. A-II, B-III, C-I, D-IV
4. A-I, B-III, C-IV, D-II

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

92 986092

Tertiary conformation of proteins is maintained by 3 types of bonds namely

1. ionic, covalent and sulfide
2. ionic, hydrogen and disulfide
3. ionic, covalent and peptide
4. covalent, peptide and sulfide

		A1 : 1		
		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

93	986093	Which of the following statements is true about affinity chromatography? 1. During the separation of a mixture of proteins, the protein which does not bind to ligand is eluted first 2. During the separation of a mixture of proteins, the protein which does not bind to ligand is eluted last 3. During the separation of a mixture of proteins, the protein which binds to ligand is eluted first 4. Unwanted proteins are eluted by ligand solution A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

94	986094	Scurvy results from deficiency of _____ and rickets results from deficiency of _____ 1. Retinol; Pantothenic acid 2. Pantothenic acid; Retinol 3. Calciferol; Ascorbic acid 4. Ascorbic acid; Calciferol A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

95	986095	Which of the following is not a function of molecular chaperone in protein folding? 1. Molecular chaperones assist in protein folding into their correct structure. 2. Molecular chaperones specify the tertiary structure of a protein. 3. Molecular chaperones can stabilize partially folded proteins and prevent them from aggregating with other proteins. 4. Molecular chaperones can shield and protect exposed hydrophobic regions of proteins. A1 : 1 A2 : 2	4.0	0.00
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A3 : 3

A4 : 4

Objective Question

96	986096	Read the following statements to describe the role of Gibbs free energy. A. Reaction can take place spontaneously if ΔG is negative. B. Reaction can take place spontaneously if ΔG is positive. C. ΔG provides no information about the rate of a reaction. D. ΔG estimation provides the rate of a reaction. Which of the following represents combination of incorrect statements? 1. A and C only 2. B and C only 3. A and D only 4. B and D only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

97	986097	Which of the following amino acid biosynthesis pathways is affected in folic acid deficiency? 1. Aspartate from oxaloacetate and glutamate 2. Glycine from glucose and alanine 3. Glutamate from glucose and ammonia 4. Serine from glucose and alanine A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

98	986098		4.0	0.00
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Match disease in Column I with appropriate causative agents in Column II and select the correct option from the codes given below:

Column I		Column II	
A.	Rheumatic heart disease	I.	<i>Candida albicans</i>
B.	Syphilis	II.	Group A Streptococcus
C.	Genital warts	III.	Human papilloma virus
D.	Oral thrush	IV.	<i>Treponema pallidum</i>

Choose the correct answer from the options given below:

1. A-I, B-II, C-IV, D-III
2. A-II, B-IV, C-III, D-I
3. A-III, B-IV, C-I, D-II
4. A-IV, B-II, C-I, D-III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

99	986099	The innate immune system recognizes Pathogen Associated Molecular Patterns (PAMPs) through activation of : 1. B cell receptors 2. Fc receptor 3. Toll-like receptor 4. T-cell receptor A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

100	986100	What is the nature of India's indigenous COVID-19 vaccine? 1. It is an mRNA vaccine (for expression of viral spike protein). 2. It is a preparation of inactivated whole virus. 3. It is a preparation of attenuated SARS-CoV-2 virus. 4. It is a recombinant, replication-deficient chimpanzee adenovirus encoding the SARS-CoV-2 spike protein. A1 : 1 A2 : 2 A3 : 3	4.0	0.00
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A4 : 4

Objective Question

101	986101	Which one of the following solutions show negative deviation from Raoult's law? 1. Chloroform and acetone 2. Bromoethane and chloroethane 3. Benzene and toluene 4. Ethanol and acetone A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

102	986102	The value of van't Hoff factor of MgSO_4 is 1. 1 2. 2 3. 3 4. 4 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

103	986103	E_{cell} of the following reaction is represented by $\text{Mg (s)} + 2\text{Ag}^+ (\text{aq}) \rightarrow \text{Mg}^{2+} (\text{aq}) + 2\text{Ag (s)}$ 1. $E_{\text{cell}} = E^{\theta}_{\text{cell}} - \frac{RT}{F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^+]^2}$ 2. $E_{\text{cell}} = E^{\theta}_{\text{cell}} - \frac{RT}{2F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^+]^2}$ 3. $E_{\text{cell}} = E^{\theta}_{\text{cell}} - \frac{RT}{2F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^+]}$ 4. $E_{\text{cell}} = E^{\theta}_{\text{cell}} - \frac{RT}{F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^+]}$ A1 : 1 A2 : 2	4.0	0.00
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A3 : 3

A4 : 4

Objective Question

104	986104	The concentration of gases is expressed in terms of their partial pressures in gaseous reactions. The unit of the rate equation is 1. $\text{atm mol}^{-1} \text{ s}^{-1}$ 2. atm mol s^{-1} 3. atm s^{-1} 4. $\text{atm}^{-1} \text{ s}^{-1}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

105	986105	Statement (I) : Rate constant is the proportionality factor in the rate law. Statement (II) : Molecularity is defined only for an elementary reaction. In the light of the above statements, choose the most appropriate answer from the options given below. 1. Both Statement (I) and Statement (II) are true. 2. Both Statement (I) and Statement (II) are false. 3. Statement (I) is true but Statement (II) is false. 4. Statement (I) is false but Statement (II) is true. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

106	986106	Statement (I) : The superoxides of alkali metals are yellow or orange in color. Statement (II) : The superoxides of alkali metals are paramagnetic. In light of the above statements, choose the most appropriate answer from the options given below. 1. Both Statement (I) and Statement (II) are true. 2. Both Statement (I) and Statement (II) are false. 3. Statement (I) is true but Statement (II) is false. 4. Statement (I) is false but Statement (II) is true. A1 : 1	4.0	0.00
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A2 : 2

A3 : 3

A4 : 4

Objective Question

107	986107	The product/s formed in the following reaction is/are $\text{CaCO}_3 + \text{CO}_2 + \text{H}_2\text{O} \rightarrow$ 1. $\text{Ca}(\text{HCO}_3)_2$ only 2. $\text{Ca}(\text{OH})_2 + \text{H}_2\text{CO}_3$ only 3. $\text{CaO} + \text{H}_2\text{CO}_3$ only 4. $\text{Ca}(\text{HCO}_3)_2 + \text{H}_2\text{CO}_3$ only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

108	986108	Match List I with List II <table><tr><th colspan="2">LIST I</th><th colspan="2">LIST II</th></tr><tr><td>A.</td><td>CO₂</td><td>I.</td><td>piezoelectric material</td></tr><tr><td>B.</td><td>Silicones</td><td>II.</td><td>Dry Ice</td></tr><tr><td>C.</td><td>Quartz</td><td>III.</td><td>drying agent</td></tr><tr><td>D.</td><td>Silica gel</td><td>IV.</td><td>group of organosilicon polymers</td></tr></table> Choose the correct answer from the options given below: 1. A-III, B-IV, C-I, D-II 2. A-III, B-II, C-I, D-IV 3. A-II, B-IV, C-I, D-III 4. A-II, B-III, C-I, D-IV A1 : 1 A2 : 2 A3 : 3 A4 : 4	LIST I		LIST II		A.	CO ₂	I.	piezoelectric material	B.	Silicones	II.	Dry Ice	C.	Quartz	III.	drying agent	D.	Silica gel	IV.	group of organosilicon polymers	4.0	0.00
LIST I		LIST II																						
A.	CO ₂	I.	piezoelectric material																					
B.	Silicones	II.	Dry Ice																					
C.	Quartz	III.	drying agent																					
D.	Silica gel	IV.	group of organosilicon polymers																					

Objective Question

109	986109		4.0	0.00
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		The correct IUPAC name of $\text{Na}[\text{Al}(\text{OH})_4]$ is 1. Sodium tetrahydroxoaluminate(III) 2. Sodium tetrahydroxoaluminium(III) 3. Sodium tetrahydroaluminate(III) 4. Sodium tetrahydroaluminium(III) A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
110	986110	Statement (I) : The thermal stability of carbonates of alkaline earth metals increases with increasing cationic size. Statement (II) : The solubility of sulphates of alkaline earth metals decreases with increasing cationic size. In light of the above statements, choose the most appropriate answer from the options given below. 1. Both Statement (I) and Statement (II) are true. 2. Both Statement (I) and Statement (II) are false. 3. Statement (I) is true but Statement (II) is false. 4. Statement (I) is false but Statement (II) is true. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
111	986111	Which one of the following statements are correct about optical isomers and enantiomers? A. Optical isomers are mirror images that cannot be superimposed on one another. B. Optical isomers are mirror images that can be superimposed on one another. C. Optical isomers are also called as enantiomers. D. Optical isomers and enantiomers are different. Choose the correct answer from the options given below: 1. A and B only 2. A and C only 3. B and C only 4. B and D only A1 : 1 A2 : 2 A3 : 3	4.0	0.00

		A4 : 4		
Objective Question				
112	986112	The IUPAC for $K_3[Cr(C_2O_4)_3]$ is 1. Potassium trioxalatochromium(II) 2. Potassium trioxalatochromate(II) 3. Potassium trioxalatochromate(III) 4. Potassium trioxalatochromium(III) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
113	986113	<i>f</i>-block elements is/are 1. Lanthanoids only 2. Actinoids only 3. Transition elements only 4. Both lanthanoids and actinoids A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
114	986114	The lanthanoids series element well known to exhibit +4 oxidation state is 1. Cerium 2. Actinium 3. Lanthanum 4. Lutetium A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
115	986115		4.0	0.00

		Stable isotope of Gold is 1. ^{199}Au 2. ^{200}Au 3. ^{204}Au 4. ^{197}Au A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

116	986116	According to VESPR theory, the shape of NH_3 is 1. Bent 2. Trigonal Pyramidal 3. Trigonal Planar 4. Square planar A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

117	986117	Statement (I) : The hybridisation of PCl_5 is sp^3d and all bonds are equivalent. Statement (II) : The hybridisation of SF_6 is sp^3d^2 and all bonds are equivalent. In the light of the above statements, choose the most appropriate answer from the options given below. 1. Both Statement (I) and Statement (II) are true. 2. Both Statement (I) and Statement (II) are false. 3. Statement (I) is true but Statement (II) is false. 4. Statement (I) is false but Statement (II) is true. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

118	986118		4.0	0.00
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		Which statement is false about ammonia? A. It is a colourless gas with pungent odour. B. It does not act as a Lewis base. C. Ammonia is soluble in water. 1. A only 2. B only 3. C only 4. A and C only A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

119	986119	The Moscovium element belongs to 1. Group 14 2. Group 15 3. Group 16 4. Group 17 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

120	986120	In S_N2 reaction, reaction between CH_3Cl and hydroxide ion to form methanol and chloride ion follows 1. A zero order kinetics 2. A 1st order kinetics 3. A 2nd order kinetics 4. A 3rd order kinetics A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

121	986121		4.0	0.00
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		Number of σ and π bonds in $\text{CH}_2 = \text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)_2$ are 1. $\sigma = 22$, $\pi = 1$ 2. $\sigma = 21$, $\pi = 1$ 3. $\sigma = 24$, $\pi = 1$ 4. $\sigma = 23$, $\pi = 1$ A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

122	986122	Vicinal dihalides as treatment with alcoholic potassium hydroxide undergo 1. Dehydrohalogenation 2. Dehalogenation only 3. Dehydration only 4. Hydrohalogenation A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

123	986123	The following reaction is known as $2\text{CH}_3\text{COONa} + 2\text{H}_2\text{O} \xrightarrow{\text{electrolysis}} \text{CH}_3\text{CH}_3 + 2\text{CO}_2 + \text{H}_2 + 2\text{NaOH}$ 1. Clark reaction 2. Kolbe's electrolytic reaction 3. Castner-Kellner reaction 4. Cannizaro reaction A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

124	986124		4.0	0.00
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		The amount of Mohr's salt required to prepare 250 ml of $\frac{1}{20}$ M aqueous solution is (Molecular mass of Mohr's salt = 392 g mol^{-1}) 1. 49 g 2. 4.9 g 3. 19.6 g 4. 1.96 g A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

125	986125	Which one of the following acid radicals is detected by the reaction with dil. H_2SO_4 in qualitative analysis? 1. Br^- 2. I^- 3. NO_3^- 4. NO_2^- A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

126	986126	LCAO stands for 1. Low combination of atomic orbitals 2. Last combination of atomic orbitals 3. Linear combination of atomic orbitals 4. Longer combination of atomic orbitals A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

127	986127		4.0	0.00
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		In electrocyclic reaction, the two sigma bonds can rotate in opposite directions. This type of reaction is known as 1. Conrotatory 2. Disrotatory 3. Cisrotatory 4. Transrotatory A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

128	986128	Which one of the following is not a basic radical of group I in qualitative analysis? 1. Sn^{2+} 2. Ag^+ 3. Pb^{2+} 4. Hg_2^{2+} A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

129	986129	Which of the following method is not used for the test of aldehydes? 1. Schiff's test 2. Tollen's test 3. Felhing's test 4. Sodium bicarbonate test A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

130	986130		4.0	0.00
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		Continue occurring in the seeds and other parts of the hemlock herb is 1. A colorless unpleasant smelling liquid 2. A colored unpleasant smelling liquid 3. A colorless pleasant-smelling liquid 4. A colored pleasant-smelling liquid A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

131	986131	In the Diel-Alder reaction, the diene must have A. Cisoid conformation B. [4+2] cycloaddition C. Transoid conformation Choose the correct answer from the options given below: 1. A only 2. B only 3. C only 4. A and B only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

132	986132	Which of the following reaction is used to reduce aldehydes or ketones to alkanes using hydrochloric acid and zinc amalgam. 1. Claisen reaction 2. Clemmensen reduction 3. Cope reaction 4. Dakin reaction A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

133	986133	The mixture of H_2O_2 and Fe^{2+} is known as 1. Gomberg reagent 2. Producer reagent 3. Fenton's reagent 4. Water-shift reagent A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

134	986134	Which one of the followings has highest negative electron gain enthalpy? 1. O 2. S 3. Se 4. Te A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

135	986135	Gilman reagents are referred as 1. Organocopper 2. Organosilver 3. Organobenzene 4. Silicones A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

136	986136		4.0	0.00
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		The product formed (X) in the following reaction is $\text{MeMgBr} \xrightarrow{\text{CuCl Transmetallation}} \text{X} + \text{MgBrCl} \text{ (reaction is not balanced)}$ 1. MeCu 2. MeCuBr 3. MeCuMgBr 4. MeCuBr₂ A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

137	986137	The common electronic configuration of <i>f</i>-block elements is 1. $ns^{1-2} (n-1)d^{0-1} (n-2)f^{1-14}$ 2. $ns^2 (n-1)d^{1-2} (n-2)f^{1-14}$ 3. $ns^{1-2} (n-1)d^{1-2} (n-2)f^{1-14}$ 4. $ns^2 (n-1)d^{0-1} (n-2)f^{1-14}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

138	986138	Which of the enzymes in human stomach convert protein into peptide? 1. Pepsin 2. Trypsin 3. Urease 4. Lactase A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

139	986139		4.0	0.00
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		Entropy is originated from 1. 1st Law of Thermodynamics 2. 2nd Law of Thermodynamics 3. 3rd Law of Thermodynamics 4. Zeroth Law of Thermodynamics A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

140	986140	Which one of the following statements is incorrect about the chemisorption? 1. It is highly specific in nature. 2. It is caused by chemical bond formation. 3. It is reversible. 4. It depends upon the nature of the gas. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

141	986141	The equilibrium constant for the reaction is $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{NO}(\text{g})$ If, the concentrations at equilibrium are $[\text{N}_2] = 3.0 \times 10^{-3} \text{ M}$, $[\text{O}_2] = 5.0 \times 10^{-3} \text{ M}$ and $[\text{NO}] = 3.0 \times 10^{-3} \text{ M}$. 1. 0.6 2. 60 3. 1.66 4. 0.166 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

142	986142		4.0	0.00
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		Which of the following species act as Bronsted acids and bases? A. H_2O B. NH_3 C. CO_3^{2-} D. H_2SO_4 Choose the correct answer from the options given below: 1. A and B only 2. A and D only 3. B and C only 4. B and D only A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

143	986143	The correct order of value of ionisation constant of bases is 1. Dimethylamine > Ammonia > Urea > Aniline 2. Dimethylamine > Aniline > Ammonia > Urea 3. Dimethylamine > Ammonia > Aniline > Urea 4. Ammonia > Dimethylamine > Urea > Aniline A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

144	986144	Dipole-dipole interaction energy between rotating polar molecules is proportional to 1. $1/r^2$ 2. $1/r^3$ 3. $1/r^4$ 4. $1/r^6$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question				
145	986145	Mathematical form of Dalton's Law of partial pressures is 1. $P_{\text{total}} = p_1 \times p_2 \times p_3 \times p_4 \times \dots$ (at constant T, V) 2. $P_{\text{total}} = p_1 + p_2 + p_3 + p_4 + \dots$ (at constant V and variable T) 3. $P_{\text{total}} = p_1 + p_2 + p_3 + p_4 + \dots$ (at constant T, V) 4. $P_{\text{total}} = p_1 \times p_2 \times p_3 \times p_4 \times \dots$ (at constant V and variable T) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
146	986146	Which of the followings are extensive properties? A. Heat Capacity B. Density C. Enthalpy D. Temperature Choose the correct answer from the options given below: 1. A and B only 2. A and C only 3. A, B and C only 4. B and C only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
147	986147	The commonly used region in infrared spectroscopy is (in cm^{-1}) 1. 400 - 4000 2. 400 - 2500 3. 200 - 3800 4. 100 - 1000 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
148	986148	In the proton NMR spectrum of ethylbenzene in CdCl_3, the ethyl moiety is identified by 1. CH_3 doublet and CH_2 quartet 2. CH_3 triplet and CH_2 quartet 3. CH_3 Triplet and CH_2 doublet 4. CH_3 doublet and CH_2 triplet A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
149	986149	Which of the following transition has lower energy in UV-visible spectroscopy? 1. σ to σ^* 2. π to π^* 3. σ to π^* 4. n to π^* A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
150	986150	In Molecular Orbital Theory, the bond order and magnetic property of Li_2 are respectively 1. 1 and paramagnetic 2. 0 and paramagnetic 3. 1 and diamagnetic 4. 0 and diamagnetic A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00

Objective Question				
151	986151		4.0	0.00

		In an ideal diode leakage current will flow in 1. Both in forward and reverse direction 2. in the forward direction 3. in the reverse direction 4. Neither in forward nor in reverse direction A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

152	986152	The impurity commonly used for realizing the base region of a silicon n-p-n transistor is 1. gallium 2. indium 3. boron 4. phosphorus A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

153	986153	Under equilibrium, the concentration of minority carriers in an extrinsic semiconductor is 1. directly proportional to the doping concentration 2. inversely proportional to the doping concentration 3. directly proportional to the intrinsic concentration 4. inversely proportional to the intrinsic concentration A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

154	986154		4.0	0.00
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		An n-p-n type bipolar junction transistor is operating in the active region. If the reverse bias across the base collector junction is increased then, 1. the effective base width increases and common-emitter current gain increases. 2. the effective base width increases and common-emitter current gain decreases. 3. effective base width decreases and common-emitter current gain increases. 4. effective base width decreases and common-emitter current gain decreases. A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

155	986155	Shallow P-well or N-well regions in CMOS technology can be produced utilizing 1. low pressure chemical vapour deposition 2. low energy sputtering 3. low temperature dry oxidation 4. low energy ion implantation A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

156	986156	In MOSFET fabrication, the channel length is defined during the process of 1. isolation oxide growth 2. channel stop implantation 3. poly-silicon gate patterning 4. lithography step leading to the contact pads A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

157	986157		4.0	0.00
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		The dynamic resistance of a Ge diode for a forward current of 2.6 mA is _____ 1. $5\ \Omega$ 2. $2.5\ \Omega$ 3. $10\ \Omega$ 4. $20.0\ \Omega$ A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

158	986158	Norton's theorem states that a complex network connected to a load can be replaced with an equivalent impedance 1. in parallel with a current source 2. in series with a current source 3. in series with a voltage source 4. in parallel with a voltage source A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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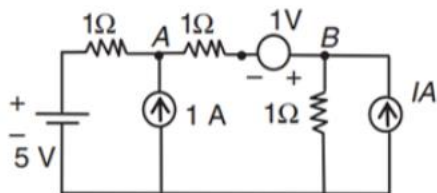
Objective Question

159	986159	A potential source of 20 V has an impedance of $Z_S = (0.5 + j1)\ \Omega$ and it is connected across a load $Z_L = (1.5 + j4)\ \Omega$. For what value of load will maximum power transfer take place? 1. $(2.0 - j5)\ \Omega$ 2. $(2.0 + j0.5)\ \Omega$ 3. $(2.0 - j1.5)\ \Omega$ 4. $(2.0 + j5)\ \Omega$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

160	986160		4.0	0.00
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What should be the value of current 'I' to have zero current flowing through AB?



1. 2 A
2. 4 A
3. -4 A
4. -2 A

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

161	986161	A source of angular frequency 1 rad/s has source impedance consisting of 1Ω resistance in series with 1 H inductance. The load that will obtain the maximum power transfer is 1. 1Ω resistance 2. 1Ω resistance in parallel with 1 H inductance 3. 1Ω resistance in series with 1 F capacitor 4. 1Ω resistance in parallel with 1 F capacitor	4.0	0.00
		A1 : 1		
		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

162	986162	Superposition Theorem is not applicable to networks containing 1. non-linear elements 2. dependent voltage sources 3. dependent current sources 4. transformers	4.0	0.00
		A1 : 1		
		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

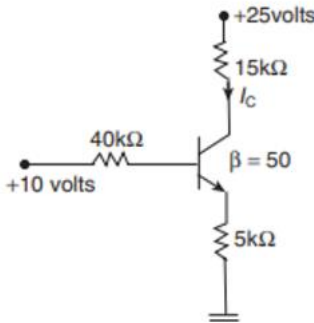
163	986163	A certain series resonant circuit has a bandwidth of 1,000 Hz. If the existing coil is replaced by a coil with low Q, what happens to the bandwidth? 1. It increases 2. It is zero 3. It decreases 4. It remains the same A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

164	986164	Consider the following statements S1 and S2 S1 : At the resonant frequency the impedance of series R-L-C circuit is zero. S2 : In a parallel G-L-C circuit, increasing the conductance G results in increase in its Q factor. Which one of the following is correct? 1. S1 is false and S2 is true 2. Both S1 and S2 are true 3. S1 is true and S2 is false 4. Both S1 and S2 are false A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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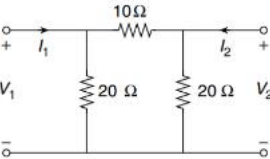
Objective Question

165	986165		4.0	0.00
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10/31/23, 9:38 AM		293_SCPH20_E_Live_1-250.html		
		Find the collector current value I_C of the following circuit.  1. 1.57 mA 2. 3.15 mA 3. 1.22 mA 4. 0.68 mA A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
166	986166	A series LCR circuit is connected to 220 V ac supply with $R = 20\ \Omega$, $X_L = 40\ \Omega$ and $X_C = 40\ \Omega$. The rms voltage across the capacitor is: 1. $440\ \angle -90^\circ$ 2. $440\ \angle +90^\circ$ 3. $220\ \angle -90^\circ$ 4. $220\ \angle +90^\circ$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
167	986167		4.0	0.00

10/31/23, 9:38 AM	293_SCPH20_E_Live_1-250.html		
	The conditions for reciprocity and electrical symmetry, respectively, among the given two-port networks are: A. $Y_{12} = Y_{21}$ and $Y_{11} = Y_{22}$ B. $h_{12} = -h_{21}$ and $h_{11} h_{22} - h_{12} h_{21} = 1$ C. $AD - BC = 1$ and $A = -D$ D. $g_{12} = g_{21}$ and $g_{11} g_{21} = 1$ Choose the correct answer from the options given below: 1. A and C only 2. A and B only 3. C and D only 4. A and D only A1 : 1 A2 : 2 A3 : 3 A4 : 4		

Objective Question

168	986168	For the 2-port network shown below, the impedance matrix (in Ω) is:  1. $\begin{bmatrix} 6 & 4 \\ 4 & 6 \end{bmatrix}$ 2. $\begin{bmatrix} 12 & -8 \\ -8 & 12 \end{bmatrix}$ 3. $\begin{bmatrix} 12 & 8 \\ 8 & 12 \end{bmatrix}$ 4. $\begin{bmatrix} 6 & -4 \\ -4 & 6 \end{bmatrix}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

169	986169		4.0	0.00
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The convergence factor $e^{\sigma t}$ (σ is real and positive) relates the Laplace transform of $f(t)$ with the Fourier transform of $f(t)$ as:

1. $L[f(t)] = F[f(t).e^{\sigma t}]$
2. $F[f(t)] = L[f(t).e^{\sigma t}]$
3. $L[f(t)] = -F[f(t).e^{\sigma t}]$
4. $F[f(t)] = -L[f(t).e^{\sigma t}]$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

170	986170	The ROC of z-transform of the sequence given below is: $\left(\frac{2}{3}\right)^n u(n) - \left(\frac{4}{3}\right)^n u(-n-1)$ 1. $z < \frac{2}{3}$ 2. $z < \frac{4}{3}$ 3. $\frac{2}{3} < z < \frac{4}{3}$ 4. $0 < z < \infty$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

171	986171	The phenomenon known as 'Early Effect' in a bipolar transistor refers to a reduction of the effective base width caused by 1. electron hole recombination at the base 2. the reverse biasing of the base-collector junction 3. the forward biasing of emitter-base junction 4. the early removal of stored base charge during saturation to cut-off switching. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

172	986172	Which one of the following statements is correct about an ac coupled common emitter amplifier operating in the mid band region? 1. The device parasitic capacitances behave like open circuits, whereas coupling and bypass capacitances behave like short circuits. 2. The device parasitic capacitances, coupling capacitances and bypass capacitances behave like open circuits. 3. The device parasitic capacitances, coupling capacitances and bypass capacitances behave like short circuits. 4. The device parasitic capacitances behave like short circuits, whereas coupling and bypass capacitances behave like open circuits. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

173

986173

Match List I with List II

4.0

0.00

LIST I		LIST II	
P.	Wien bridge oscillator	I.	Low-output Impedance
Q.	Voltage shunt feedback amplifier	II.	RF frequency range
R.	Crystal oscillator	III.	Audio frequency range
S.	Current shunt feedback amplifier	IV.	High-output impedance

Choose the correct answer from the options given below:

1. P Q R S
2 1 3 4

2. P Q R S
3 4 2 1

3. P Q R S
3 4 1 2

4. P Q R S
3 1 2 4

A1 : 1

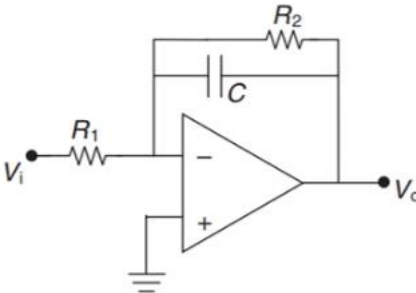
A2 : 2

A3 : 3

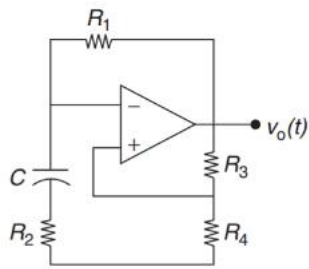
A4 : 4

Objective Question

174	986174		4.0	0.00
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10/31/23, 9:38 AM		293_SCPH20_E_Live_1-250.html	
		Recognize the type of filter shown below  1. low-pass filter 2. high-pass filter 3. band-pass filter 4. band-stop filter A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
175	986175	The CMRR of a differential amplifier is 60 dB. If the differential mode gain is 1,400, what is the common mode gain AC? 1. 1.4 2. 2.1 3. 0.8 4. None A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0 0.00
Objective Question			
176	986176		4.0 0.00

In the following multivibrator circuit, which properties of $V_o(t)$ depend on R_2 ?



1. Only the frequency
2. Only the amplitude
3. Both the amplitude and the frequency
4. Neither the amplitude nor the frequency

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

177 986177

The feedback network of Hartley oscillator have $L_1 = 10 \text{ mH}$, $L_2 = 5 \text{ mH}$, and $C = 100 \text{ PF}$. The mutual inductance between L_1 and L_2 is 2.5 mH . The frequency of oscillation is _____.

1. 0.13 MHz
2. 11.3 kHz
3. 0.113 MHz
4. None

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0

0.00

Objective Question

178 986178

4.0

0.00

Match List I with List II

Comparison of operational amplifier parameters in a real device Voltage Gain

LIST I		LIST II	
A.	Voltage Gain	I.	10 V/ μ s
B.	Input Resistance	II.	100,000
C.	Output resistance	III.	100 M Ω
D.	Slew-Rate	IV.	20 Ω

Choose the correct answer from the options given below:

1. A – I, B – II, C – III, D - IV
2. A – I, B – III, C – II, D - IV
3. A – II, B – III, C – IV, D - I
4. A – I, B – II, C – IV, D - III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

179	986179	Determine the frequency of oscillation of a three-stage ladder network oscillator in which $C = 10 \text{ nF}$ and $R = 10 \text{ k}\Omega$ 1. 642 kHz 2. 544 Hz 3. 647 Hz 4. 247 Hz A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

180	986180	During measurements on an operational amplifier under open-loop conditions, an output voltage of 12 V is produced by an input voltage of 1 mV. Determine the open- loop voltage gain expressed in dB. 1. 82 dB 2. 78 dB 3. 115 dB 4. 28 dB A1 : 1 A2 : 2 A3 : 3	4.0	0.00
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A4 : 4

Objective Question

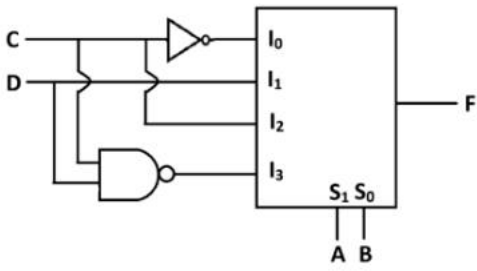
181	986181	4-bit 2s compliment representation of a decimal number is 1001. The number is: 1. +8 2. 0 3. -7 4. -8 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

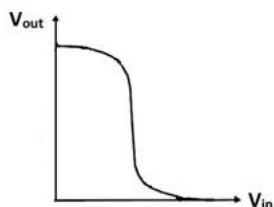
182	986182	The number of essential prime implicants for the k-map Boolean function shown in the figure is: <table><tr><td> AB CD </td><td>00</td><td>01</td><td>11</td><td>10</td></tr><tr><td>00</td><td>1</td><td>1</td><td>0</td><td>1</td></tr><tr><td>01</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>11</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>10</td><td>1</td><td>0</td><td>1</td><td>1</td></tr></table> 1. 2 2. 4 3. 6 4. 5 A1 : 1 A2 : 2 A3 : 3 A4 : 4	AB CD	00	01	11	10	00	1	1	0	1	01	0	0	0	1	11	1	0	0	0	10	1	0	1	1	4.0	0.00
AB CD	00	01	11	10																									
00	1	1	0	1																									
01	0	0	0	1																									
11	1	0	0	0																									
10	1	0	1	1																									

Objective Question

183	986183	The minimum number of 2 input NOR gates required to implement a 2-input XNOR gate is: 1. 4 2. 5 3. 3 4. 7 A1 : 1 A2 : 2	4.0	0.00
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		A3 : 3		
		A4 : 4		
Objective Question				
184	986184	The Boolean function realized by the logic circuit shown in the below figure is:  1. $F = \sum m(0,1,3,5,8,9,11)$ 2. $F = \sum m(2,3,5,7,10,14,15)$ 3. $F = \sum m(1,2,4,5,7,11,13)$ 4. $F = \sum m(0,1,5,7,10,11,12,13,14)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
185	986185	For a logic family if: V_{IH} = minimum input high-level voltage V_{IL} = maximum input low-level voltage V_{OH} = minimum output high-level voltage V_{OL} = maximum output low-level voltage Then the correct relationship is: 1. $V_{IH} > V_{OH} > V_{IL} > V_{OL}$ 2. $V_{OH} > V_{IH} > V_{IL} > V_{OL}$ 3. $V_{IH} > V_{OH} > V_{OL} > V_{IL}$ 4. $V_{OH} > V_{IH} > V_{OL} > V_{IL}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
Objective Question				
186	986186		4.0	0.00

The given VTC corresponds to:



1. CMOS inverter
2. NMOS inverter in enhancement mode transistor as load
3. PMOS inverter in depletion mode transistor as load
4. BJT inverter

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

187	986187	Statement 1 : Dual slope converter minimizes the effect of power supply interference Statement 2 : Successive approximation converter requires an analog-to-digital converter 1. Both Statement 1 and Statement 2 are true 2. Both Statement 1 and Statement 2 are false 3. Statement 1 is true but Statement 2 is false 4. Statement 1 is false but Statement 2 is true A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

188	986188	The number of comparators required for a 4-bit comparator type ADC is: 1. 8 2. 9 3. 16 4. 15 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

189	986189	Which one among these is the fundamental characteristic of an astable multivibrator: 1. It has two stable states 2. It has one stable state and one unstable state 3. It continuously oscillates between its two stable states 4. It requires an external clock signal to operate A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

190	986190	Which type of clock signal has a 50% duty cycle? 1. Asynchronous clock 2. Synchronous clock 3. Pulse-width modulated clock 4. Oscillating clock A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

191	986191	An FM wave is represented by $v = 12 \sin(6 \times 10^8 t + 5 \sin 1250t)$. Calculate the power dissipation. 1. 7.2 W 2. 8.2 W 3. 10.2 W 4. 11.2 W A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

192	986192		4.0	0.00
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		Which of these components is a part of the phase-locked loop (PLL) oscillator? 1. Low-pass filter 2. Voltage-controlled oscillator (VCO) 3. Mixer. 4. Frequency divider A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

193	986193	A 20 MHz carrier is frequency modulated by a sinusoidal signal of 500 Hz, the maximum frequency deviation being 100 KHz. The bandwidth required as per the Carson's rule is: 1. 50 KHz 2. 100 KHz 3. 101 KHz 4. 201 KHz A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

194	986194	The Hilbert transform of $\cos \omega_1 t + \sin \omega_2 t$ is: 1. $\cos \omega_1 t - \sin \omega_2 t$ 2. $\sin \omega_1 t + \sin \omega_2 t$ 3. $\sin \omega_1 t - \cos \omega_2 t$ 4. $\cos \omega_1 t + \cos \omega_2 t$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

195	986195		4.0	0.00
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		The modulation index in amplitude modulation is defined as? 1. The ratio of carrier frequency to modulation frequency 2. The ratio of modulation amplitude to carrier amplitude 3. The ratio of modulation frequency to carrier frequency 4. The ratio of sideband frequency to carrier frequency A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

196	986196	When the modulation index in amplitude modulation > 1, then: 1. Overmodulation leads to distortion and inefficient transmission 2. No modulation occurs 3. The carrier signal is eliminated 4. The sidebands become narrower A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

197	986197	Which type of modulation waveform is used as the modulating signal in most AM transmissions? 1. Sawtooth wave 2. Square wave 3. Sine wave 4. Triangle wave A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

198	986198		4.0	0.00
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		In AM modulation, the carrier amplitude _____ . 1. Remains constant 2. Varies with the modulation frequency 3. Decreases as modulation increases 4. Varies with the modulation amplitude A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

199	986199	The bandwidth required for QPSK modulated channel is _____ the bandwidth of BPSK: 1. 2 times 2. $\frac{1}{2}$ times 3. Equal 4. 4 times A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

200	986200	Quantization noise can be reduced by increasing the: 1. Number of quantum levels 2. Sampling rate 3. Bandwidth 4. Carrier frequency A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

201	986201		4.0	0.00
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		A phase difference $\frac{\pi}{2}$ between two interfering beams is equivalent to path difference 1. λ 2. $\frac{\lambda}{2}$ 3. $\frac{\lambda}{4}$ 4. 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

202	986202	Brewster's law in terms of refractive index (μ) and polarising angle (i_p) can be expressed as 1. $\mu = \cot i_p$ 2. $\mu = \sin i_p$ 3. $\mu = \tan i_p$ 4. $\mu = \cos i_p$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

203	986203	How much phase change is introduced by a half wave plate between ordinary and extra-ordinary rays 1. π 2. 0 3. $\frac{\pi}{2}$ 4. $\frac{\pi}{4}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

204	986204		4.0	0.00
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		The ratio of intensities of two waves that produce interference pattern is 1:16. The ratio of maximum to minimum intensities in fringe system is 1. 25:9 2. 1:16 3. 1:4 4. 9:25 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

205	986205	If N is the total number of rulings on the grating, n is the order of the spectrum and λ is the wavelength of the light used, then the resolving power of the grating is given by 1. $Nn\lambda$ 2. $\frac{N\lambda}{n}$ 3. $\frac{N}{n}$ 4. Nn A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

206	986206	To find prominent diffraction, the size of the diffracting object should be 1. Greater than the wavelength of the light used 2. Of the order of wavelength of light used 3. Less than the wavelength of light used 4. Independent of the wavelength of light used A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

207	986207		4.0	0.00
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		The pressure p and volume V of an ideal gas system both increase in a process. 1. Such a process is not possible 2. The temperature of the system must increase 3. Heat supplied to the gas is equal to the change in internal energy 4. The work done by the system is zero A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

208	986208	The internal energy of an ideal gas decreases by the same amount as the work done by the system. 1. The process must be adiabatic. 2. Such a process is not possible. 3. The process must be isobaric 4. The temperature must decrease A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

209	986209	Let Q and W denote the amount of heat given to an ideal gas and the work done by it in an isothermal process. 1. $Q = 0$ 2. $W = 0$ 3. $Q \neq W$ 4. $Q = W$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

210	986210		4.0	0.00
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		For any transformation occurring at constant temperature and pressure, the change in Gibbs free energy can be 1. negative only 2. positive or zero 3. zero only 4. negative or zero A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

211	986211	Helmholtz free energy A is defined as (U is internal energy, p is pressure, V is volume, T is temperature, S is entropy): 1. $A = U - TS$ 2. $A = U + TS$ 3. $A = U - pV - TS$ 4. $A = U + pV + TS$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

212	986212	What is the flux through a square of 4m^2 area parallel to the xy plane due to uniform electric field of 50 N/C along Y axis and 10 N/C along z axis. 1. $240\text{ Nm}^2\text{C}^{-1}$ 2. $0\text{ Nm}^2\text{C}^{-1}$ 3. $40\text{ Nm}^2\text{C}^{-1}$ 4. $200\text{ Nm}^2\text{C}^{-1}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

213	986213		4.0	0.00
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		When the magnitude of the two charges is doubled, the electric potential energy of the charges is, 1. doubled 2. quadrapled 3. halved 4. reduced by a factor of four A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

214	986214	Flux of the electric field through spherical surface of radius r due to a point charge q at its centre is 1. doubled if q is doubled 2. does not change if q is doubled 3. halved if q doubled 4. quadrupled if q doubled A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

215	986215	Consider a thin infinitely long straight wire of uniform linear charge density λ. The electric field at a perpendicular distance r from the wire 1. varies as λ 2. varies as λ^2 3. varies as $\frac{1}{\lambda}$ 4. varies as $\frac{1}{\lambda^2}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

216	986216		4.0	0.00
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		If the separation between plates of parallel plate capacitor is doubled, its capacitance 1. quadrapled 2. doubled 3. unchanged 4. halved A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

217	986217	A straight conductor is lying along x axis in a homogenous magnetic field along y axis. If the magnetic field is doubled the force experienced by the conductor is 1. quadrapled 2. halved 3. unchanged 4. doubled A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

218	986218	A charged particle is moved along a magnetic field line. The magnetic force on the particle is 1. along its velocity 2. opposite to its velocity 3. perpendicular to its velocity 4. zero A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

219	986219		4.0	0.00
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		Consider a long straight conductor of circular cross section of radius “a” carrying a steady current distributed uniformly over its cross section. The magnitude of the magnetic field at radius $r > a$ outside the conductor is: 1. zero 2. proportional to r 3. proportional to $\frac{1}{r}$ 4. proportional to r^2 A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

220	986220	A conducting loop is placed in a uniform magnetic field with its plane perpendicular to the field. An emf is induced in the loop if 1. it is translated 2. it is rotated about its axis 3. it is stationary 4. it is deformed A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

221	986221	The magnetic field in a plane electromagnetic wave is given by $B_y = 2 \times 10^{-7} \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t)$ T. What is the frequency of the wave? 1. 150 GHz 2. 23.9 GHz 3. 6.66 pHz 4. 6.66 nHz A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

222	986222		4.0	0.00
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		Let p and E denote the linear momentum and energy of a photon. If the wavelength is decreased 1. both p and E increase 2. p increases and E decreases 3. p decreases and E increases 4. both p and E decrease A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

223	986223	Quantum mechanics suggests that 1. waves can behave as particles while the converse is not possible 2. particles can behave as waves while the converse is not possible 3. particles can behave as waves and waves can behave as particles 4. neither waves nor particles can behave like each other A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

224	986224	If the width of box for a particle trapped in a rigid one-dimensional box is doubled then the magnitude of the n^{th} energy level 1. decreases by 4 times 2. decreases by 2 times 3. increases by 4 times 4. increases by 2 times A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

225	986225		4.0	0.00
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		The quantum mechanical operator for the total energy of a particle moving in one dimension is 1. $\left(\frac{ih}{2\pi}\right)\left(\frac{d}{dx}\right)$ 2. $\left(\frac{ih}{2\pi}\right)\left(\frac{d}{dt}\right)$ 3. $\left(-\frac{ih}{2\pi}\right)\left(\frac{d}{dx}\right)$ 4. $\left(-\frac{ih}{2\pi}\right)\left(\frac{d}{dt}\right)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

226	986226	The time dependent Schrodinger equation of a system represents the conservation of the 1. Total energy of the system 2. Total potential energy of the system 3. Total kinetic energy of the system 4. Total binding energy of the system A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

227	986227	The wave nature of the electron beam is verified by its 1. deflection by an electric field 2. diffraction by a crystal 3. deflection by a magnetic field 4. Ionization of gas A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

228	986228		4.0	0.00
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Consider an hydrogen atom. Match list I with list II.

LIST I		LIST II	
A.	Quantization of energy	I.	Principle quantum number n
B.	Quantization of angular momentum magnitude	II.	Magnetic quantum number m_l
C.	Quantization of angular momentum direction	III.	Orbital quantum number l

Choose the correct answer from the options given below:

1. A-II, B-I, C-III
2. A-I, B-III, C-II
3. A-III, B-II, C-I
4. A-I, B-II, C-III

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

229	986229	Spacing between energy levels of a one-dimensional harmonic oscillator 1. is constant 2. increases with quantum number n 3. decreases with quantum number n 4. decreases for lower values of quantum number n and increases for higher values of quantum number n A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

230	986230	On increasing temperature, the specific heat at constant volume of a material 1. Is a constant at very high temperatures 2. Is a constant at very low temperatures 3. Varies as T^3 at very high temperatures 4. Varies as T at very low temperatures A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

231	986231	If a pair of one cation and one anion is missing from their respective positions in an ionic crystal that defect is called 1. Frenkel defect 2. Schottky defect 3. pair of vacancies 4. Surface defect A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

232	986232	The unit cell with three lattice parameters is 1. tetragonal 2. orthorhombic 3. rhombohedral 4. hexagonal A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

233	986233	Thermal expansion of materials arises from 1. strong bonds 2. asymmetry of potential energy curve 3. thermal vibrations 4. weak bonds A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

234	986234		4.0	0.00
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		With increase in temperature, the orientation polarization, in general 1. Varies exponentially 2. Varies linearly 3. Is independent of temperature 4. Varies inversely A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

235	986235	In the polarization versus field strength plot for a ferroelectric material, P_s stands for 1. space charge polarization 2. saturation polarization 3. spontaneous polarization 4. saturation magnetization A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

236	986236	The probability of occupation of an energy level E, when $E - E_F = kT$, is given by 1. 0.73 2. 0.63 3. 0.27 4. 0.5 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

237	986237		4.0	0.00
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		The most suitable materials for making coils for electromagnets of very high field strengths are 1. Type I superconductors 2. Type II superconductors 3. Both Type I and Type II superconductors 4. Elemental superconductors A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

238	986238	The magnetic susceptibility of an ideal Type-I superconductor below H_c : 1. is equal to 1 2. lies between 0 and 1 3. is equal to -1 4. lies between -1 and 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

239	986239	A plane cuts intercepts a, 2b and 4c along the crystallographic axes in a crystal. The Miller indices of plane 1. (124) 2. (241) 3. (421) 4. (412) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

240	986240		4.0	0.00
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For a closed packed body centred cubic (bcc) structure of hard spheres, the lattice constant "a" is related to the sphere radius "R" as

1. $a = \frac{4R}{\sqrt{3}}$

2. $a = \frac{4R}{\sqrt{2}}$

3. $a = \frac{4R}{3}$

4. $a = 2R$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

241	986241	In a semiconductor, the intrinsic concentration of charge carriers varies as: 1. T 2. $T^{3/2}$ 3. $\frac{1}{T}$ 4. T^2 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

242	986242	Temperature dependence of the electrical resistivity (ρ) of a metal according to the classical free electron theory is 1. $\rho \propto T^2$ 2. $\rho \propto T$ 3. $\rho \propto T^{-2}$ 4. $\rho \propto T^{1/2}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

243	986243	In a ferroelectric material, the spontaneous polarisation vanishes above a certain temperature called 1. Transition temperature 2. Debye temperature 3. Curie temperature 4. Fermi temperature A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

244	986244	Einstein's theory concludes that at lower temperatures the specific heat 1. drops linearly with increase of temperature 2. drops linearly with decrease of temperature 3. drops exponentially with decrease of temperature 4. remains constant A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

245	986245	The spacing between the n^{th} energy level and the next higher level in a one-dimensional potential box increases by 1. $(n - 1)$ 2. $(2n + 1)$ 3. $(2n - 1)$ 4. $(n - 1)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

246	986246		4.0	0.00
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		For a particular material, the Hall coefficient is found to be zero. The material is 1. Intrinsic semiconductor 2. Insulator 3. n-type semiconductor 4. p-type semiconductor A1 : 1 A2 : 2 A3 : 3 A4 : 4		
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Objective Question

247	986247	Which of the following material does not have permanent magnetic dipoles? 1. Antiferromagnetic 2. Ferrimagnetic 3. Paramagnetic 4. Diamagnetic A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

248	986248	In a superconducting state 1. entropy increases and thermal conductivity decreases 2. entropy and thermal conductivity decrease 3. entropy and thermal conductivity increases 4. entropy decreases and thermal conductivity increases A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00
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Objective Question

249	986249		4.0	0.00
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		X-rays are produced when an element of high atomic weight is bombarded by high energy- 1. electrons 2. photons 3. protons 4. neutrons A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
250	986250	The number of atoms in a finite one-dimensional lattice is N. The number of modes of vibration in the lattice is 1. N 2. 2N 3. N - 1 4. N - 2 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.00