

69 Bioinformatics ICAR SEPT 2022

Topic:- GEN KNOW COMMON PHD

1) Colour of the tag used on certified seed bags is[Question ID = 16958][Question Description = 101_221_GKD_SEP22_Q01]

1. Blue [Option ID = 37829]
2. Purple [Option ID = 37830]
3. White [Option ID = 37831]
4. Golden Yellow [Option ID = 37832]

2) Following are the statements regarding the Usar soil -

- A. It is reclaimed by adding lime.
- B. This soil has pH more than seven.
- C. Paddy crop can be grown in this soil.

Choose the *correct* answer from the options given below:

[Question ID = 16959][Question Description = 102_221_GKD_SEP22_Q02]

1. A and B only [Option ID = 37833]
2. B and C only [Option ID = 37834]
3. C only [Option ID = 37835]
4. A only [Option ID = 37836]

3) When total utility of a commodity increases, marginal utility will be

[Question ID = 16960][Question Description = 103_221_GKD_SEP22_Q03]

1. Negative but increasing
[Option ID = 37837]
2. Positive but decreasing
[Option ID = 37838]
3. Constant
[Option ID = 37839]
4. Either positive or negative
[Option ID = 37840]

4) Where is the headquarter of International Fund for Agriculture Development located?

[Question ID = 16961][Question Description = 104_221_GKD_SEP22_Q04]

1. Vienna, Austria
[Option ID = 37841]
2. Rome, Italy
[Option ID = 37842]
3. New York, USA
[Option ID = 37843]
4. Berlin, Germany
[Option ID = 37844]

5) Mid-Oceanic Ridges are one of the important divisions of the ocean floor. In this respect, point out the incorrect statement regarding the 'Mid-Oceanic Ridges'. [Question ID = 16962][Question Description = 105_221_GKD_SEP22_Q05]

1. It is the largest mountain chain on the surface of the earth [Option ID = 37845]
2. It is a series of interconnected chain within the ocean. [Option ID = 37846]
3. It is characterised by a central rift system [Option ID = 37847]
4. The rift system at the crest is the zone of very low volcanic activity. [Option ID = 37848]

6) Consider the following facts about the union territory of India and point out the one which is incorrect in relation to union territory. [Question ID = 16963][Question Description = 106_221_GKD_SEP22_Q06]

1. These are the areas under the direct control of central government. [Option ID = 37849]
2. Also known as the 'centrally administered territories'. [Option ID = 37850]

3. These territories constitute a conspicuous departure from the unitary feature of India. [Option ID = 37851]
4. There is no uniformity in their administrative systems. [Option ID = 37852]

7) Variety of flora and fauna are found in the different types of forest in India. In this regard, species of trees like teak, *sal shisham*, *sandalwood*, etc. are found in which of the following type of forests in India?[Question ID = 16964][Question Description = 107_221_GKD_SEP22_Q07]

1. Tropical evergreen forests [Option ID = 37853]
2. Tropical thorn forests [Option ID = 37854]
3. Tropical deciduous forests [Option ID = 37855]
4. Montane forests [Option ID = 37856]

8) The Marginal Preference Theory of consumption behaviour was proposed by

[Question ID = 16965][Question Description = 108_221_GKD_SEP22_Q08]

1. Armstrong
[Option ID = 37857]
2. J.K.Hicks
[Option ID = 37858]
3. Neumann
[Option ID = 37859]
4. Edmund Cannon
[Option ID = 37860]

9) Point out the incorrect statements regarding the service sector in India.[Question ID = 16966][Question Description = 109_221_GKD_SEP22_Q09]

1. It is the highest contributor to GDP [Option ID = 37861]
2. It requires skilled labour [Option ID = 37862]
3. It is the fastest growing sector [Option ID = 37863]
4. It is restricted to very few sectors. [Option ID = 37864]

10) Consider the statements regarding the agriculture sector in India and point out the incorrect statement.[Question ID = 16967][Question Description = 110_221_GKD_SEP22_Q10]

1. Agriculture sector is the largest employer of workforce [Option ID = 37865]
2. It has contributed to the Gross Value Added (GVA) [Option ID = 37866]
3. Growth in allied sectors is the major drivers of overall growth in the sector. [Option ID = 37867]
4. Minimum Support Price (MSP) policy is used as to promote crop uniformity. [Option ID = 37868]

11) In case of related goods, the cross elasticity of demand is[Question ID = 16968][Question Description = 111_221_GKD_SEP22_Q11]

1. Low [Option ID = 37869]
2. High [Option ID = 37870]
3. Zero [Option ID = 37871]
4. Unity [Option ID = 37872]

12) With reference to organic farming in India, consider the following statements :

- A. The National Programme for Organic Production' (NPOP) is operated under the guidelines and directions of the Union Ministry of Rural Development.
- B. The Agricultural and Processed Food Products Export Development Authority' (APEDA) functions as the Secretariat for the implementation of NPOP.
- C. Sikkim has become India's first fully organic state.

Choose the *correct* answer from the options given below:

[Question ID = 16969][Question Description = 112_221_GKD_SEP22_Q12]

1. A and B only
[Option ID = 37873]
2. B and C only
[Option ID = 37874]
3. C only
[Option ID = 37875]
4. A, B and C

[Option ID = 37876]

13) With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following falls under the Conservation Agriculture ?

- A. Avoiding the monoculture practices.
- B. Adopting minimum tillage.
- C. Avoiding the cultivation of plantation crops.
- D. Using crop residues to cover soil surface.
- E. Adopting spatial and temporal crop sequencing/ crop rotations.

Choose the *correct* answer from the options given below:

[Question ID = 16970][Question Description = 113_221_GKD_SEP22_Q13]

- 1. A, C and D only [Option ID = 37877]
- 2. B, C, D and E only [Option ID = 37878]
- 3. B, D and E only [Option ID = 37879]
- 4. A, B, C and E only [Option ID = 37880]

14) Consumers are likely to get a variety of goods in which kind of market competition[Question ID = 16971][Question Description = 114_221_GKD_SEP22_Q14]

- 1. Monopoly [Option ID = 37881]
- 2. Duopoly [Option ID = 37882]
- 3. Oligopoly [Option ID = 37883]
- 4. Monopolistic [Option ID = 37884]

15) What is the correct chronological order of the following laws enacted for the conservation and protection of environment ?

- A. Environment (Protection) Act.
- B. Water (Prevention & Control of Pollution) Act.
- C. Air (Prevention & Control of pollution) Act.
- D. National Green Tribunal Act.

Choose the *correct* answer from the options given below:

[Question ID = 16972][Question Description = 115_221_GKD_SEP22_Q15]

- 1. B, C, A, D [Option ID = 37885]
- 2. A, B, C, D [Option ID = 37886]
- 3. C, B, A, D [Option ID = 37887]
- 4. D, C, B, A [Option ID = 37888]

16) The scientific study of soil is[Question ID = 16973][Question Description = 116_221_GKD_SEP22_Q16]

- 1. Earth Study [Option ID = 37889]
- 2. Soil Science [Option ID = 37890]
- 3. Pedology [Option ID = 37891]
- 4. Soil Chemistry [Option ID = 37892]

17) *Triticum aestivum*, the common bread wheat is -

[Question ID = 16974][Question Description = 117_221_GKD_SEP22_Q17]

- 1. Tetraploid

[Option ID = 37893]

- 2. Hexaploid

[Option ID = 37894]

- 3. Haploid

[Option ID = 37895]

- 4. Diploid

[Option ID = 37896]

18) Sectoral inflation refers to[Question ID = 16975][Question Description = 118_221_GKD_SEP22_Q18]

- 1. Running inflation [Option ID = 37897]

2. Comprehensive inflation [Option ID = 37898]
3. Sporadic inflation [Option ID = 37899]
4. Creeping inflation [Option ID = 37900]

19) Keynes Liquidity trap refers to[Question ID = 16976][Question Description = 119_221_GKD_SEP22_Q19]

1. Speculative demand for money [Option ID = 37901]
2. Transactions motive of money is inelastic [Option ID = 37902]
3. Precautionary motive of money is inelastic [Option ID = 37903]
4. Transactions motive of money is constant [Option ID = 37904]

20) A business is solvent if[Question ID = 16977][Question Description = 120_221_GKD_SEP22_Q20]

1. Total receipts exceed total expenditures [Option ID = 37905]
2. Total debt exceeds total equity [Option ID = 37906]
3. Total sales exceed total cash expense [Option ID = 37907]
4. Total assets exceed total liabilities [Option ID = 37908]

Topic:- Agricultural Statistics_PHD

1) The mean of a set of 30 observations is 75. If each of the observation is multiplied by a non-zero number λ and then each of them is decreased by 25, their mean remains the same. The λ is equal to

[Question ID = 16708][Question Description = 101_41_COMP_SEP22_Q01]

1. 10/3 [Option ID = 36829]
2. 4/3 [Option ID = 36830]
3. 1/3 [Option ID = 36831]
4. 2/3 [Option ID = 36832]

2) Let X and Y be two random variables. Which one of the following conditions is sufficient for the relation $\text{Var}(X-Y) = \text{Var}(X) + \text{Var}(Y)$ to hold ?[Question ID = 16709][Question Description = 102_41_COMP_SEP22_Q02]

1. X, Y are statistically independent [Option ID = 36833]
2. X, Y are identically distributed [Option ID = 36834]
3. $X = Y$ [Option ID = 36835]
4. For any X and Y [Option ID = 36836]

3) The coefficient of correlation between X and Y is 0.6. Their covariance is 4.8. If the variance of X is 9, then the standard deviation of Y is[Question ID = 16710][Question Description = 103_41_COMP_SEP22_Q03]

1. 7.21 [Option ID = 36837]
2. 5.23 [Option ID = 36838]
3. 3.22 [Option ID = 36839]
4. 2.67 [Option ID = 36840]

4) A random sample of 60 farmers provides 40 fertilizer users. If the standard error of the proportion of fertilizer users in this sample is 0.12, then the 95% confidence limits of the fertilizer users of the population of farmers are

[Question ID = 16711][Question Description = 104_41_COMP_SEP22_Q04]

1. 66%, 89% [Option ID = 36841]
2. 66%, 79% [Option ID = 36842]
3. 50%, 82% [Option ID = 36843]
4. 55%, 79% [Option ID = 36844]

5) Let $(X_1, X_2, X_3, \dots, X_n)$ be a random sample from $N(\mu, \sigma^2)$ distribution, where both μ and σ^2 are unknown. The shortest expected confidence interval length for μ is obtained using

[Question ID = 16712][Question Description = 105_41_COMP_SEP22_Q05]

1. Standard normal distribution [Option ID = 36845]
2. t - distribution [Option ID = 36846]
3. F - distribution [Option ID = 36847]
4. Chi-square distribution [Option ID = 36848]

6) If T is an MLE of θ and $\psi(\theta)$ is one-to-one function of θ , then $\psi(T)$ is the MLE of $\psi(\theta)$. This property is known as

[Question ID = 16713][Question Description = 106_41_COMP_SEP22_Q06]

1. Invariance property of MLE [Option ID = 36849]
2. Asymptotic property of MLE [Option ID = 36850]
3. Consistency property of MLE [Option ID = 36851]
4. Regularity property of MLE [Option ID = 36852]

7) In a Chi-square test, the contingency table has 4 rows and 4 columns. What is the degrees of freedom?

[Question ID = 16714][Question Description = 107_41_COMP_SEP22_Q07]

1. 3 [Option ID = 36853]
2. 4 [Option ID = 36854]
3. 8 [Option ID = 36855]
4. 9 [Option ID = 36856]

8) Chi-square test can be applied to test the

- A. Goodness of fit
- B. Equality of two population variances
- C. Independence of attributes

Choose the *correct* answer from the options given below:

[Question ID = 16715][Question Description = 108_41_COMP_SEP22_Q08]

1. A and B only [Option ID = 36857]
2. B and C only [Option ID = 36858]
3. A and C only [Option ID = 36859]
4. A, B and C only [Option ID = 36860]

9) The Bayes' estimator of a parameter under absolute error loss function is [Question ID = 16716][Question Description = 109_41_COMP_SEP22_Q09]

1. Posterior mean [Option ID = 36861]
2. Posterior median [Option ID = 36862]
3. Posterior mode [Option ID = 36863]
4. Posterior variance [Option ID = 36864]

10) In a 2-way ANOVA with 6 rows, 5 columns and 3 observations per cell, what are the degrees of freedom for the sum of squares for interaction and error respectively? [Question ID = 16717][Question Description = 110_41_COMP_SEP22_Q10]

1. 20 and 60 [Option ID = 36865]
2. 30 and 50 [Option ID = 36866]
3. 20 and 40 [Option ID = 36867]
4. 15 and 65 [Option ID = 36868]

11) In case of Fairfield Smith's variance law in the model $V_x = V_1/x^b$, the coefficient b generally takes the value between (Here the notations have their usual meanings)

[Question ID = 16718][Question Description = 111_41_COMP_SEP22_Q11]

1. $-\infty$ to ∞
[Option ID = 36869]
2. 0 to ∞
[Option ID = 36870]
3. 0 to 1
[Option ID = 36871]
4. -1 to 1
[Option ID = 36872]

12) In a strip plot design, the effect of interest is [Question ID = 16719][Question Description = 112_41_COMP_SEP22_Q12]

1. Factor applied to strip 1 [Option ID = 36873]
2. Factor applied to strip 2 [Option ID = 36874]
3. Interaction of factors applied to different strips [Option ID = 36875]

4. All the above [Option ID = 36876]

13) Cluster sampling is better than simple random sampling if the intra-class correlation coefficient is

[Question ID = 16720][Question Description = 113_41_COMP_SEP22_Q13]

1. Positive and less than one [Option ID = 36877]
2. Negative [Option ID = 36878]
3. One [Option ID = 36879]
4. Zero [Option ID = 36880]

14) In stratified sampling with $N_1 = 2N_2$, $S_1 = 2S_2$, the values of n_1 and n_2 obtained under Neyman allocation satisfy (Here the notations have their usual meanings)

[Question ID = 16721][Question Description = 114_41_COMP_SEP22_Q14]

1. $n_1 : n_2 :: 1 : 4$ [Option ID = 36881]
2. $n_1 : n_2 :: 2 : 1$ [Option ID = 36882]
3. $n_1 : n_2 :: 4 : 1$ [Option ID = 36883]
4. $n_1 : n_2 :: 1 : 2$ [Option ID = 36884]

15) Let a population of size $N = 5$ have its mean $\bar{X}_N = 12$ and $S^2 = 100$. A sample of size $n = 2$ is drawn without replacement. If the sample mean is \bar{X}_n , then $E(\bar{X}_n^2)$ is

[Question ID = 16722][Question Description = 115_41_COMP_SEP22_Q15]

1. 174 [Option ID = 36885]
2. 144 [Option ID = 36886]
3. 50 [Option ID = 36887]
4. 30 [Option ID = 36888]

16) What would be the heritability estimate if regression of offspring on mother is 0.27, assuming that resemblance due to environment or dominance was negligible? [Question ID = 16723][Question Description = 116_41_COMP_SEP22_Q16]

1. 0.21 [Option ID = 36889]
2. 0.27 [Option ID = 36890]
3. 0.54 [Option ID = 36891]
4. 0.81 [Option ID = 36892]

17) A maize population was found to be segregating for yellow and white endosperm. Yellow is governed by a dominant allele and white by its recessive allele. A random sample of 1000 kernels revealed that 910 were yellow. Find the frequency estimates of dominant and recessive alleles respectively for this population. [Question ID = 16724][Question Description = 117_41_COMP_SEP22_Q17]

1. 0.9, 0.1 [Option ID = 36893]
2. 0.7, 0.3 [Option ID = 36894]
3. 0.8, 0.2 [Option ID = 36895]
4. 0.1, 0.9 [Option ID = 36896]

18) A population of adult mice has a mean body weight of 30 grams. The average weight of mice selected for breeding purposes is 34 grams. The progeny produced by random mating among the selected parents average 30.5 grams. The genetic gain (in grams) is [Question ID = 16725][Question Description = 118_41_COMP_SEP22_Q18]

1. 0.5 [Option ID = 36897]
2. 2.0 [Option ID = 36898]
3. 3.5 [Option ID = 36899]
4. 4.0 [Option ID = 36900]

19) In relational Algebra, two relation instances are said to be union-compatible if the following conditions hold:
Condition I: They have the same number of the fields

Condition II: Corresponding fields, taken in order from left to right, does not have the same domains.

Choose the correct answer from the options given below:

[Question ID = 16726][Question Description = 119_41_COMP_SEP22_Q19]

1. Condition I is correct. [Option ID = 36901]
2. Condition II is correct. [Option ID = 36902]
3. Both Conditions I and II are correct. [Option ID = 36903]
4. Both Conditions I and II are incorrect. [Option ID = 36904]

20) UPGMA method is used for- [Question ID = 16727][Question Description = 120_41_COMP_SEP22_Q20]

1. Carbohydrate Structure Prediction [Option ID = 36905]
2. Protein Structure Prediction [Option ID = 36906]
3. Phylogenetic Analysis [Option ID = 36907]
4. Primer Designing

[Option ID = 36908]

21) Which of the following is protein sequence database?[Question ID = 16728][Question Description = 121_41_COMP_SEP22_Q21]

1. Sequin [Option ID = 36909]
2. GEO [Option ID = 36910]
3. SWISSPROT [Option ID = 36911]
4. EMBL [Option ID = 36912]

22) DNA is made up of following molecules except

[Question ID = 16729][Question Description = 122_41_COMP_SEP22_Q22]

1. Phosphate

[Option ID = 36913]

2. Pentose Sugar

[Option ID = 36914]

3. Hexose Sugar

[Option ID = 36915]

4. Nitrogenous Bases

[Option ID = 36916]

23) At what position of DNA, amino group is attached?[Question ID = 16730][Question Description = 123_41_COMP_SEP22_Q23]

1. 1' [Option ID = 36917]
2. 2' [Option ID = 36918]
3. 3' [Option ID = 36919]
4. 5'

[Option ID = 36920]

24) Which of the following has 3D structure?[Question ID = 16731][Question Description = 124_41_COMP_SEP22_Q24]

1. mRNA [Option ID = 36921]
2. tRNA [Option ID = 36922]
3. miRNA [Option ID = 36923]
4. siRNA

[Option ID = 36924]

25) Smith Waterman algorithm is designed to find

[Question ID = 16732][Question Description = 125_41_COMP_SEP22_Q25]

1. Global alignment [Option ID = 36925]
2. Local alignment [Option ID = 36926]
3. 2D Structure Prediction [Option ID = 36927]
4. 3D Structure Prediction [Option ID = 36928]

26) Position Specific Scoring Matrices are used to find the[Question ID = 16733][Question Description = 126_41_COMP_SEP22_Q26]

1. Closely related species [Option ID = 36929]
2. Distantly related species [Option ID = 36930]
3. Members of same species [Option ID = 36931]
4. Entirely different species [Option ID = 36932]

27) Which of the following is not a nucleotide sequence database?

[Question ID = 16734][Question Description = 127_41_COMP_SEP22_Q27]

1. EMBL [Option ID = 36933]

2. DDBJ [Option ID = 36934]
3. PDB [Option ID = 36935]
4. GenBank [Option ID = 36936]

28) Consider the following statements regarding Needleman-Wunsch algorithm for global sequence alignment:

- A. For two sequences of length m and n , a scoring matrix of dimensions m and n is created.
- B. The algorithm is based on dynamic programming technique.
- C. The optimal alignment is determined by a trace-back procedure.

Choose the *correct* answer from the options given below.

[Question ID = 16735][Question Description = 128_41_COMP_SEP22_Q28]

1. Only A and B are true [Option ID = 36937]
2. Only B and C are true [Option ID = 36938]
3. Only A and C are true [Option ID = 36939]
4. All A, B and C are true [Option ID = 36940]

29) The number of bifurcating rooted trees for n operational taxonomic units ($n \geq 2$) is given by [Question ID = 16736]

[Question Description = 129_41_COMP_SEP22_Q29]

1. $\frac{(2n-5)!}{2^{n-5}(n-2)!}$

[Option ID = 36941]

2. $\frac{(2n-5)!}{2^{n-3}(n-3)!}$

[Option ID = 36942]

3. $\frac{(2n-3)!}{2^{n-3}(n-2)!}$

[Option ID = 36943]

4. $\frac{(2n-3)!}{2^{n-2}(n-2)!}$

[Option ID = 36944]

30) Match List I with List II

List I	List II
A. Geno3D	I. Program for phylogenetic analysis
B. Chime	II. Protein structure validation program
C. PAUP	III. Molecular viewer
D. PROVE	IV. Protein modelling web server

Choose the correct answer from the options given below:

[Question ID = 16737][Question Description = 130_41_COMP_SEP22_Q30]

1. A - I, B - IV, C - II, D - III [Option ID = 36945]
2. A - IV, B - II, C - I, D - III [Option ID = 36946]
3. A - IV, B - III, C - I, D - II [Option ID = 36947]
4. A - IV, B - I, C - II, D - III [Option ID = 36948]

31) The single-letter amino acid code for tyrosine is [Question ID = 16738][Question Description = 131_41_COMP_SEP22_Q31]

1. T [Option ID = 36949]
2. Y [Option ID = 36950]
3. R [Option ID = 36951]
4. U [Option ID = 36952]

32) Consider the following statements regarding homology modeling of protein structure:

Statement I: Homology modeling requires alignment of a target to a template.

Statement II: The accuracy of homology modeling is independent of the percent identity between the target and the template.

In light of the above statements, choose the *most appropriate* answer from the options given below.

[Question ID = 16739][Question Description = 132_41_COMP_SEP22_Q32]

1. Both Statement I and Statement II are correct [Option ID = 36953]
2. Both Statement I and Statement II are incorrect [Option ID = 36954]
3. Statement I is correct but Statement II is incorrect [Option ID = 36955]
4. Statement I is incorrect but Statement II is correct [Option ID = 36956]

33) A module in Perl is [Question ID = 16740][Question Description = 133_41_COMP_SEP22_Q33]

1. A collection of values of same type [Option ID = 36957]
2. A collection of related subroutines and variables [Option ID = 36958]
3. An array of functions [Option ID = 36959]
4. Hash array [Option ID = 36960]

34) Consider the following statements regarding normalization algorithms:

Statement I: Median normalization scales the samples so that they have the same median.

Statement II: Quantile normalization forces the distribution of the samples to be the same.

In light of the above statements, choose the *most appropriate* answer from the options given below.

[Question ID = 16741][Question Description = 134_41_COMP_SEP22_Q34]

1. Both Statement I and Statement II are correct [Option ID = 36961]
2. Both Statement I and Statement II are incorrect [Option ID = 36962]
3. Statement I is correct but Statement II is incorrect [Option ID = 36963]
4. Statement I is incorrect but Statement II is correct [Option ID = 36964]

35) Which of the following statements is incorrect about workstations? [Question ID = 16742][Question Description = 135_41_COMP_SEP22_Q35]

1. Workstations have higher computation power than personal computers. [Option ID = 36965]
2. They have high resolution graphics terminals and improved input/output capabilities. [Option ID = 36966]
3. Workstations are used in engineering applications and in interactive graphics applications. [Option ID = 36967]
4. In workstations, many nodes are connected via network. [Option ID = 36968]

36) Read the following statements regarding Memory Unit of Computer System.

A. The memory unit is used to store programs and data.

B. Usually there are two types of memory devices: primary storage device and secondary storage memory device.

C. The primary memory, commonly called main memory is a fast memory used for the storage of programs and active data.

D. The main memory unit consists of a large number of semiconductor storage cells, each capable of storage cells, each capable of storing one bit of information.

E. These cells are read or written by the central processing unit in a group of fixed size called word.

Choose the *correct* option from the following options

[Question ID = 16743][Question Description = 136_41_COMP_SEP22_Q36]

1. A, B, C and D only [Option ID = 36969]
2. B, C, D and E only [Option ID = 36970]
3. All statements are correct [Option ID = 36971]
4. All statements are incorrect [Option ID = 36972]

37) Which of the following statements is not correct about URL?

[Question ID = 16744][Question Description = 137_41_COMP_SEP22_Q37]

1. The transfer protocol, a method that a computer uses to access this file.

[Option ID = 36973]

2. The address part of the URL is called domain name. It is preceded by two slashes i.e. the text after http:// or https:// [Option ID = 36974]

3. URL is simply an address of a document on the Web or, more accurately, on the Internet. [Option ID = 36975]

4. A URL can look complex and long, it is made up of four basic parts - protocols, hostname, folder name, file name and password - each of which has a specific function.

[Option ID = 36976]

38) Given below are two statements

Statement I: JDBC interface allows Java applets, Servlets and applications to access data in popular database management

systems.

Statement II: ODBC is a microsoft's implementation of Call Level Interface (CLI) which allows the programmer to develop, compile and deploy an application without targeting a specific DBMS.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 16745][Question Description = 138_41_COMP_SEP22_Q38]

1. Both Statement I and Statement II are correct [Option ID = 36977]
2. Both Statement I and Statement II are incorrect [Option ID = 36978]
3. Statement I is correct but Statement II is incorrect [Option ID = 36979]
4. Statement I is incorrect but Statement II is correct [Option ID = 36980]

39) What is configuration management in Software Development Life Cycle (SDLC)?

[Question ID = 16746][Question Description = 139_41_COMP_SEP22_Q39]

1. It is a process of tracking and controlling the bugs in software in terms of the running of the product.
[Option ID = 36981]
2. It is a process of tracking and controlling the functionality of the software in terms of its working.
[Option ID = 36982]
3. It is a process of tracking and controlling the changes in software in terms of the requirements, design, functions and development of the product.
[Option ID = 36983]
4. It is a process of tracking and controlling the users of the software in terms of the unusual access.
[Option ID = 36984]

40) Given below are two statements about Binary Relationship and Cardinality

Statement I: A relationship where two entities are participating is called a binary relationship.

Statement II: Cardinality is the number of instance of an entity from a relation that can be associated with the relation.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 16747][Question Description = 140_41_COMP_SEP22_Q40]

1. Both Statement I and Statement II are correct [Option ID = 36985]
2. Both Statement I and Statement II are incorrect [Option ID = 36986]
3. Statement I is correct but Statement II is incorrect [Option ID = 36987]
4. Statement I is incorrect but Statement II is correct [Option ID = 36988]

41) Read the following statements about database schema carefully

- A. A database schema is the skeleton structure that represents the logical view of the entire database.
- B. It defines how the data is organized and how the relations among them are associated.
- C. It does not formulate any constraint that is to be applied on the data.
- D. A database schema defines its entities and the relationships among them.
- E. It contains a descriptive detail of the database, which can be depicted by means of schema diagrams. It's the database designers who design the schema to help programmers understand the database and make it useful.

Choose the *incorrect* statement from the options given below

[Question ID = 16748][Question Description = 141_41_COMP_SEP22_Q41]

1. Statement C is incorrect [Option ID = 36989]
2. Statement D is incorrect [Option ID = 36990]
3. Statement A is incorrect. [Option ID = 36991]
4. Statement B is incorrect. [Option ID = 36992]

42) The number of participating entities in a relationship defines which of the relationship?

[Question ID = 16749][Question Description = 142_41_COMP_SEP22_Q42]

1. Entity set [Option ID = 36993]
2. Domain [Option ID = 36994]
3. Degree [Option ID = 36995]
4. Scope [Option ID = 36996]

43) Processes that stay in the background to handle some activity such as web pages, printing, and so on are called

[Question ID = 16750][Question Description = 143_41_COMP_SEP22_Q43]

1. Daemons [Option ID = 36997]
2. Kernel [Option ID = 36998]
3. Interrupt vector [Option ID = 36999]
4. Errno [Option ID = 37000]

44) The binary search method needs comparisons not more than

[Question ID = 16751][Question Description = 144_41_COMP_SEP22_Q44]

1. $(\log 2n)+1$ [Option ID = 37001]
2. $\log 2n$ [Option ID = 37002]
3. $(\log n)+1$ [Option ID = 37003]
4. $\log n$ [Option ID = 37004]

45) Which of the following statement is not true for "Lists": [Question ID = 16752][Question Description = 145_41_COMP_SEP22_Q45]

1. Lists are flexible structures [Option ID = 37005]
2. Lists can be concatenated together and can be split into sub-lists [Option ID = 37006]
3. Elements cannot be accessed, inserted, or deleted at any position within a list [Option ID = 37007]
4. Lists are applied in information retrieval, programming language translation and simulation [Option ID = 37008]

46) How many cables and ports are required for a star topology?

[Question ID = 16753][Question Description = 146_41_COMP_SEP22_Q46]

1. 10 ports and 5 cables [Option ID = 37009]
2. 20 ports and 5 cables [Option ID = 37010]
3. 30 ports and 5 cables [Option ID = 37011]
4. 50 ports and 5 cables [Option ID = 37012]

47) In X.25 network layer protocol, the data packets normally contain: [Question ID = 16754][Question Description = 147_41_COMP_SEP22_Q47]

1. One octet of header plus data [Option ID = 37013]
2. Two octets of header plus data [Option ID = 37014]
3. Three octets of header plus data [Option ID = 37015]
4. Four octets of header plus data [Option ID = 37016]

48) Compile-time Polymorphism in Java is achieved by:

[Question ID = 16755][Question Description = 148_41_COMP_SEP22_Q48]

1. Dynamic Method Dispatch [Option ID = 37017]
2. Method Overloading [Option ID = 37018]
3. Function Overloading [Option ID = 37019]
4. Operator Overriding [Option ID = 37020]

49) Repeated execution of simple computation may cause compounding of [Question ID = 16756][Question Description = 149_41_COMP_SEP22_Q49]

1. round-off errors [Option ID = 37021]
2. syntax errors [Option ID = 37022]
3. run-time errors [Option ID = 37023]
4. logic errors [Option ID = 37024]

50) Which of the following statements is false about String?

[Question ID = 16757][Question Description = 150_41_COMP_SEP22_Q50]

1. String is immutable [Option ID = 37025]
2. String can be created using new operator [Option ID = 37026]
3. String is a primary data type [Option ID = 37027]
4. String is an infinite sequence of symbols [Option ID = 37028]

1) In DNA, Nitrogenous bases is present in ribose sugar at

[Question ID = 16758][Question Description = 101_61_BIF_SEP22_Q01]

1. 1' position [Option ID = 37029]
2. 2' position [Option ID = 37030]
3. 3' position [Option ID = 37031]
4. 4' position [Option ID = 37032]

2) How many synonymous codons are available for coding the Arginine amino acid?

[Question ID = 16759][Question Description = 102_61_BIF_SEP22_Q02]

1. 3 [Option ID = 37033]
2. 4 [Option ID = 37034]
3. 6 [Option ID = 37035]
4. 8 [Option ID = 37036]

3) Functionally related protein-coding sequences are often clustered together into

- A. Shine-Dalgarno
- B. Domains
- C. Motifs
- D. Operons

Choose the *correct* answer from the options given below:

[Question ID = 16760][Question Description = 103_61_BIF_SEP22_Q03]

1. Only A is True [Option ID = 37037]
2. B and C are True [Option ID = 37038]
3. Only D is True [Option ID = 37039]
4. C and D are True [Option ID = 37040]

4) Which of the following statement(s) is/are true?

- A. Free 3' hydroxyl (OH) group from the growing strand of DNA attacks the phosphate on the next base to be added
- B. Free 5' hydroxyl (OH) group from the growing strand of DNA attacks the phosphate on the next base to be added
- C. Free 2' hydroxyl (OH) group from the growing strand of DNA attacks the phosphate on the next base to be added
- D. Pyrophosphate is released and the new base forms a phosphodiester bond with the growing strand of DNA

Choose the *correct* answer from the options given below:

[Question ID = 16761][Question Description = 104_61_BIF_SEP22_Q04]

1. A and B are True [Option ID = 37041]
2. Only A is True [Option ID = 37042]
3. Only C is True [Option ID = 37043]
4. A and D are True [Option ID = 37044]

5) Wobble base pairing is the characteristic of which of these molecules

- A. mRNA
- B. DNA
- C. tRNA
- D. miRNA

Choose the *correct* answer from the options given below:

[Question ID = 16762][Question Description = 105_61_BIF_SEP22_Q05]

1. A and C are True [Option ID = 37045]
2. Only B is True [Option ID = 37046]
3. Only C is True [Option ID = 37047]
4. C and D are True [Option ID = 37048]

6) Which of the following is/are incorrect about mate pair and paired end library?

- A. Using paired-end reads, repeats can be unambiguously aligned in complex genomes

B. In Mate-paired library construction, large DNA fragments are circularized using internal adapters.

C. Direction of sequencing in the case of paired end is in outward direction

D. Assembly of the small reads will be easy by using mate pair and paired end library

Choose the *correct* answer from the options given below:

[Question ID = 16763][Question Description = 106_61_BIF_SEP22_Q06]

1. Only A is incorrect [Option ID = 37049]
2. Only B is incorrect [Option ID = 37050]
3. Only C is incorrect [Option ID = 37051]
4. C and D are incorrect [Option ID = 37052]

7) Which of the following NGS technology uses bridge PCR for template amplification?

A. Solexa Technology

B. Solid

C. Rosche 454

D. Ion Torrent

Choose the *correct* answer from the options given below:

[Question ID = 16764][Question Description = 107_61_BIF_SEP22_Q07]

1. Only A is correct
[Option ID = 37053]
2. Only B is correct
[Option ID = 37054]
3. B and C are correct
[Option ID = 37055]
4. B and D are correct
[Option ID = 37056]

8) In OLC approach of genome assembly, which of the following is/are correct?

A. Reads are edges

B. Overlaps are nodes

C. Follow Hamiltonian Path

D. Dynamic Programming is used

Choose the *correct* answer from the options given below:

[Question ID = 16765][Question Description = 108_61_BIF_SEP22_Q08]

1. Only A is correct
[Option ID = 37057]
2. Only B is correct
[Option ID = 37058]
3. A and B are correct
[Option ID = 37059]
4. C and D are correct
[Option ID = 37060]

9) Advantage(s) of using de-Bruijn graph for genome assembly is/are

A. Finding overlaps between reads are no longer needed

B. Finding shortest Eulerian super path is very simple

C. Simplification in resolving repeats

D. Algorithm does not require heuristic approach

Choose the *correct* answer from the options given below:

[Question ID = 16766][Question Description = 109_61_BIF_SEP22_Q09]

1. Only A is correct

[Option ID = 37061]

2. Only B is correct

[Option ID = 37062]

3. A and C are correct

[Option ID = 37063]

4. B and D are correct

[Option ID = 37064]

10) Which of the following assembler does not follow the de Bruijn Graph approach of genome assembly?

A. Arachne

B. Celera

C. Velvet

D. Ray

Choose the *correct* answer from the options given below:

[Question ID = 16767][Question Description = 110_61_BIF_SEP22_Q10]

1. Only A is correct [Option ID = 37065]

2. Only B is correct [Option ID = 37066]

3. A and B are true [Option ID = 37067]

4. C and D are true [Option ID = 37068]

11) Which of the following statement(s) is/are true?

A. OLC approach of genome assembly follow Hamiltonian Path

B. OLC approach of genome assembly follow Eulerian Path

C. de-Bruijn graph based approach of genome assembly follow Eulerian Path

D. de-Bruijn graph approach of genome assembly follow Hamiltonian Path

Choose the *correct* answer from the options given below:

[Question ID = 16768][Question Description = 111_61_BIF_SEP22_Q11]

1. Only A is correct [Option ID = 37069]

2. Only B is correct [Option ID = 37070]

3. A and C are true [Option ID = 37071]

4. B and D are true

[Option ID = 37072]

12) Which of the following file format is used for evaluation of sequence quality?[Question ID = 16769][Question Description = 112_61_BIF_SEP22_Q12]

1. FASTA [Option ID = 37073]

2. BAM [Option ID = 37074]

3. FASTQ [Option ID = 37075]

4. SAM

[Option ID = 37076]

13) Match List I with List II

List I	List II
A. Expected Value of Random Variable	I. Rare events
B. Measure of Dispersion	II. Bayes Theorem
C. Probability Mass Function	III. Mean
D. Poisson distribution	IV. Variance
E. Prior distribution	V. Discrete Variable

Choose the correct answer from the options given below:

[Question ID = 16770][Question Description = 113_61_BIF_SEP22_Q13]

1. A - I, B - II, C - III, D - IV, E - V [Option ID = 37077]
2. A - II, B - I, C - IV, D - III, E - V [Option ID = 37078]
3. A - III, B - I, C - IV, D - V, E - II [Option ID = 37079]
4. A - III, B - IV, C - V, D - I, E - II [Option ID = 37080]

14) Expected Ratio of segregation with no linkage in the cross type AaBbXaaBb is [Question ID = 16771][Question Description = 114_61_BIF_SEP22_Q14]

1. 1:1:1:1 [Option ID = 37081]
2. 3:1:3:1 [Option ID = 37082]
3. 9:3:3:1 [Option ID = 37083]
4. 9:3:1:1 [Option ID = 37084]

15) In a large random mating population, frequency of the heterozygotes is equal to the [Question ID = 16772][Question Description = 115_61_BIF_SEP22_Q15]

1. Product of the frequencies of two homozygotes [Option ID = 37085]
2. Sum of the frequencies of two homozygotes [Option ID = 37086]
3. Sum of square of the frequencies of two homozygotes [Option ID = 37087]
4. Square root of the frequencies of two homozygotes [Option ID = 37088]

16) Determination of repeatability is useful for breeding as it gives the idea about

- A. Degree of genetic determination of the character
- B. Upper limit of heritability
- C. Gain in Accuracy to be expected from multiple measurement
- D. Degree of statistical determination of the character

Choose the *correct* answer from the options given below:

[Question ID = 16773][Question Description = 116_61_BIF_SEP22_Q16]

1. Only A is correct [Option ID = 37089]
2. Only B is correct [Option ID = 37090]
3. B and C are true [Option ID = 37091]
4. A and D are true

[Option ID = 37092]

17) Which of the following statement(s) is/are true?

- A. Additive variance is greater than genetic variance
- B. Additive variance is smaller than genetic variance
- C. Narrow Sense Heritability is measured on the basis of genetic variance
- D. Broad Sense Heritability is measured on the basis of genetic variance

Choose the *correct* answer from the options given below:

[Question ID = 16774][Question Description = 117_61_BIF_SEP22_Q17]

1. Only A is correct [Option ID = 37093]
2. Only B is correct [Option ID = 37094]
3. A and C are true [Option ID = 37095]
4. B and D are true [Option ID = 37096]

18) How many genetically different gametes can be made by an individual of genotype Aa Bb cc DD Ee?

[Question ID = 16775][Question Description = 118_61_BIF_SEP22_Q18]

1. 5
[Option ID = 37097]
2. 8
[Option ID = 37098]
3. 10
[Option ID = 37099]
4. 32
[Option ID = 37100]

19) Which of the following design of experiment is/are used for separating genetic changes from environmental research in the case of animal breeding?

- A. Repeat Mating Design
- B. Latin Square Design
- C. Random Bred Control
- D. Circular Design

Choose the *correct* answer from the options given below:

[Question ID = 16776][Question Description = 119_61_BIF_SEP22_Q19]

- 1. Only A is true [Option ID = 37101]
- 2. A and B are true [Option ID = 37102]
- 3. A and C are true [Option ID = 37103]
- 4. C and D are true [Option ID = 37104]

20) The statement “Rate of increase of fitness of a population at given time is equal to its genetic variance of fitness of population at that time” is related with

- A. Fisher’s Fundamental Theorem
- B. Hardy Weinberg Law
- C. Law of Independent Assortment
- D. Law of Segregation

Choose the *correct* answer from the options given below:

[Question ID = 16777][Question Description = 120_61_BIF_SEP22_Q20]

- 1. Only A is correct
[Option ID = 37105]
- 2. Only C is correct
[Option ID = 37106]
- 3. A and C are correct
[Option ID = 37107]
- 4. B and D are correct
[Option ID = 37108]

21) What is the correct order in de Bruijn graph based genome assembly?

- A. Error Correction, Building a deBruijn Graph, Generation of k-mers hash table
- B. Error Correction, Generation of k-mers hash table, Building a deBruijn Graph
- C. Generation of k-mers hash table, Building a deBruijn Graph, Error Correction
- D. Building a deBruijn Graph, Error Correction, Generation of k-mers hash table

Choose the *correct* answer from the options given below

[Question ID = 16778][Question Description = 121_61_BIF_SEP22_Q21]

- 1. A only [Option ID = 37109]
- 2. B only [Option ID = 37110]
- 3. C only [Option ID = 37111]
- 4. D only [Option ID = 37112]

22) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : Error correction is a crucial step in genome assembly following k-mer graph approach

Reason R : Error correction helps to resolve the problems of repeats present in the genome

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 16779][Question Description = 122_61_BIF_SEP22_Q22]

- 1. Both A and R are true and R is the correct explanation of A [Option ID = 37113]
- 2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 37114]
- 3. A is true but R is false [Option ID = 37115]
- 4. A is false but R is true [Option ID = 37116]

23) In relational Algebra, two relation instances are said to be union-compatible if the following conditions hold:

Condition I: They have the same number of the fields

Condition II: Corresponding fields, taken in order from left to right, does not have the same *domains*.

Choose the *correct* answer from the options given below:

[Question ID = 16780][Question Description = 123_61_BIF_SEP22_Q23]

1. Condition I is correct. [Option ID = 37117]
2. Condition II is correct. [Option ID = 37118]
3. Both Conditions I and II are correct. [Option ID = 37119]
4. Both Conditions I and II are incorrect. [Option ID = 37120]

24) Match List I with List II

List I	List II
A. Relation	I. Record
B. Attribute	II. Field
C. Tuple	III. Entity
D. Primary Key	IV. Repetition Allowed
E. Foreign Key	V. Repetition Not Allowed

Choose the correct answer from the options given below:

[Question ID = 16781][Question Description = 124_61_BIF_SEP22_Q24]

1. A - I, B - II, C - III, D - IV, E - V [Option ID = 37121]
2. A - II, B - I, C - III, D - IV, E - V [Option ID = 37122]
3. A - I, B - II, C - IV, D - III, E - V [Option ID = 37123]
4. A - III, B - II, C - I, D - V, E - IV [Option ID = 37124]

25) Given below are two statements, one is labelled as Question Q and the other is labelled as Answer A.

Question Q: How the DBMS handles queries and updates (with respect to concurrency control and recovery)?

Answer A: To read a database object, it is first brought into main memory from disk, and then its value is copied into a program variable and to write a database object, an in-memory copy of the object is first modified and then written to disk.

Choose the *correct* answer from the options given below:

[Question ID = 16782][Question Description = 125_61_BIF_SEP22_Q25]

1. A is correct answer of Q [Option ID = 37125]
2. A is incorrect answer of Q [Option ID = 37126]
3. Q is incorrect question [Option ID = 37127]
4. Q and A both are incorrectly written. [Option ID = 37128]

26) Which one of the following is a literature database?[Question ID = 16783][Question Description = 126_61_BIF_SEP22_Q26]

1. Ensembl [Option ID = 37129]
2. MEDLINE [Option ID = 37130]
3. BRENDA [Option ID = 37131]
4. DALI [Option ID = 37132]

27) Which one of the following tool is used for submitting and updating sequences to the GenBank, EMBL and DDBJ databases?

[Question ID = 16784][Question Description = 127_61_BIF_SEP22_Q27]

1. TransFac [Option ID = 37133]
2. Sequin [Option ID = 37134]
3. PipMaker [Option ID = 37135]
4. Chime [Option ID = 37136]

28) Which PAM or BLOSUM matrix is best suited to detect distantly related proteins?[Question ID = 16785][Question Description = 128_61_BIF_SEP22_Q28]

1. PAM10 or BLOSUM45 [Option ID = 37137]
2. PAM10 or BLOSUM80 [Option ID = 37138]
3. PAM250 or BLOSUM45 [Option ID = 37139]
4. PAM250 or BLOSUM80 [Option ID = 37140]

29) Consider the following statements regarding MegaBLAST:

- A. MegaBLAST is a program optimized for aligning long sequences.
- B. MegaBLAST can work only with DNA sequences.
- C. MegaBLAST implements a greedy algorithm for DNA sequence gapped alignment search.

Choose the *correct* answer from the options given below.

[Question ID = 16786][Question Description = 129_61_BIF_SEP22_Q29]

- 1. Only A is true [Option ID = 37141]
- 2. Only A and C are true [Option ID = 37142]
- 3. Only A and B are true [Option ID = 37143]
- 4. All A, B and C are true [Option ID = 37144]

30) Given below are two statements regarding FASTA search algorithm:

Statement I: The FASTA search algorithm was introduced by Pearson and Lipman in 1985 and further improved in 1988.

Statement II: FASTA stands for FAST-All, referring to its ability to perform a fast alignment of all sequences.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16787][Question Description = 130_61_BIF_SEP22_Q30]

- 1. Both Statement I and Statement II are true [Option ID = 37145]
- 2. Both Statement I and Statement II are false [Option ID = 37146]
- 3. Statement I is true but Statement II is false [Option ID = 37147]
- 4. Statement I is false but Statement II is true [Option ID = 37148]

31) Match List I with List II

List I	List II
A. Global alignment	I. Steven Henikoff and Jorja G. Henikoff (1992)
B. Local alignment	II. Margaret Dayhoff (1978)
C. PAM matrix	III. Saul Needleman and Christian Wunsch (1970)
D. BLOSUM matrix	IV. Temple F. Smith and Michael S. Waterman (1981)

Choose the correct answer from the options given below:

[Question ID = 16788][Question Description = 131_61_BIF_SEP22_Q31]

- 1. A - III, B - IV, C - I, D - II [Option ID = 37149]
- 2. A - III, B - IV, C - II, D - I [Option ID = 37150]
- 3. A - IV, B - III, C - II, D - I [Option ID = 37151]
- 4. A - IV, B - III, C - I, D - II [Option ID = 37152]

32) The possible number of unrooted trees for five operational taxonomic units (OTUs) is [Question ID = 16789][Question Description = 132_61_BIF_SEP22_Q32]

- 1. 1 [Option ID = 37153]
- 2. 3 [Option ID = 37154]
- 3. 15 [Option ID = 37155]
- 4. 105 [Option ID = 37156]

33) The Hamming distance between AGTCGCGA and CGCGTTTA is [Question ID = 16790][Question Description = 133_61_BIF_SEP22_Q33]

- 1. 4 [Option ID = 37157]
- 2. 5 [Option ID = 37158]
- 3. 6 [Option ID = 37159]
- 4. 2 [Option ID = 37160]

34) Given below are two statements regarding the UPGMA (unweighted pair group method using arithmetic mean) method of tree construction, one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: The UPGMA method produces a rooted tree.

Reason R: The UPGMA method assumes a varying rate of evolution.

In light of the above statements, choose the *most appropriate* answer from the options given below.

[Question ID = 16791][Question Description = 134_61_BIF_SEP22_Q34]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 37161]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 37162]
3. A is correct but R is not correct [Option ID = 37163]
4. A is not correct but R is correct [Option ID = 37164]

35) Given below are two statements regarding the terminologies used in phylogeny:

Statement I: Clade is a group of all the taxa that have been derived from a common ancestor plus the common ancestor itself.

Statement II: A clade is also called a polyphyletic group.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16792][Question Description = 135_61_BIF_SEP22_Q35]

1. Both Statement I and Statement II are true [Option ID = 37165]
2. Both Statement I and Statement II are false [Option ID = 37166]
3. Statement I is true but Statement II is false [Option ID = 37167]
4. Statement I is false but Statement II is true [Option ID = 37168]

36) Consider the following two statements regarding programs for plotting trees and consensus trees:

Statement I: CONSENSE program can compute consensus trees by the majority-rule consensus tree method.

Statement II: DRAWGRAM program can be used to plot rooted phylogenies, cladograms and phenograms.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16793][Question Description = 136_61_BIF_SEP22_Q36]

1. Both Statement I and Statement II are true [Option ID = 37169]
2. Both Statement I and Statement II are false [Option ID = 37170]
3. Statement I is true but Statement II is false [Option ID = 37171]
4. Statement I is false but Statement II is true [Option ID = 37172]

37) Consider the following two statements regarding phylogenetic methods of constructing phylogenies from sequence data:

Statement I: Maximum Parsimony method minimizes the distance between the closest neighbors.

Statement II: Maximum Likelihood method maximizes the likelihood of the tree given certain values for the parameters.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16794][Question Description = 137_61_BIF_SEP22_Q37]

1. Both Statement I and Statement II are true [Option ID = 37173]
2. Both Statement I and Statement II are false [Option ID = 37174]
3. Statement I is true but Statement II is false [Option ID = 37175]
4. Statement I is false but Statement II is true [Option ID = 37176]

38) Which one of the following tools cannot be used to visualize 3D structure of proteins?[Question ID = 16795][Question Description = 138_61_BIF_SEP22_Q38]

1. PyMol [Option ID = 37177]
2. Cn3D [Option ID = 37178]
3. Chime [Option ID = 37179]
4. Webin [Option ID = 37180]

39) Protein secondary structure prediction algorithms generally calculate the likelihood that a protein forms[Question ID = 16796][Question Description = 139_61_BIF_SEP22_Q39]

1. α helices [Option ID = 37181]
2. α helices and β sheets [Option ID = 37182]
3. α helices and coils [Option ID = 37183]
4. α helices, β sheets, and coils [Option ID = 37184]

40) Consider the following statements regarding the UniProt databases:

Statement I: The UniProt Knowledgebase (UniProtKB) provides the central database of protein sequences with accurate, consistent, rich sequence and functional annotation.

Statement II: The UniProt Archive (UniParc) provides condensed data collections based on the UniProt Knowledgebase in order to obtain complete coverage of sequence space at several resolutions.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16797][Question Description = 140_61_BIF_SEP22_Q40]

1. Both Statement I and Statement II are true [Option ID = 37185]
2. Both Statement I and Statement II are false [Option ID = 37186]
3. Statement I is true but Statement II is false [Option ID = 37187]
4. Statement I is false but Statement II is true [Option ID = 37188]

41) Consider the following statements regarding protein structure modelling:

Statement I: Homology modelling methods assume that two homologous proteins will share very similar structures.

Statement II: The strategy used in Geno3D is comparative protein structure modelling by spatial restraints (distances and dihedral) satisfaction.

In light of the above statements, choose the *correct* answer from the options given below.

[Question ID = 16798][Question Description = 141_61_BIF_SEP22_Q41]

1. Both Statement I and Statement II are true [Option ID = 37189]
2. Both Statement I and Statement II are false [Option ID = 37190]
3. Statement I is true but Statement II is false [Option ID = 37191]
4. Statement I is false but Statement II is true [Option ID = 37192]

42) Consider the following statements regarding docking process:

- A. Docking is a process by which two different structures are compared using computational approach.
- B. Docking is a process by which a lead compound is simplified by removing excess functional groups.
- C. Docking is a process by which drugs are fitted into their target binding sites using computational approach.

Choose the *correct* answer from the options given below.

[Question ID = 16799][Question Description = 142_61_BIF_SEP22_Q42]

1. Only A is true [Option ID = 37193]
2. Only B and C are true [Option ID = 37194]
3. Only A and C are true [Option ID = 37195]
4. Only C is true [Option ID = 37196]

43) Match List I with List II

List I	List II
A. Q-SiteFinder	I. RNA secondary structure prediction method
B. mfold	II. <i>ab initio</i> protein structure prediction tool
C. GROMOS	III. Force field for molecular dynamics
D. QUARK	IV. Protein-ligand binding site prediction method

Choose the correct answer from the options given below:

[Question ID = 16800][Question Description = 143_61_BIF_SEP22_Q43]

1. A - III, B - II, C - I, D - IV [Option ID = 37197]
2. A - IV, B - III, C - II, D - I [Option ID = 37198]
3. A - IV, B - I, C - III, D - II [Option ID = 37199]
4. A - IV, B - III, C - I, D - II [Option ID = 37200]

44) What is the file extension for the Perl programming script file?

[Question ID = 16801][Question Description = 144_61_BIF_SEP22_Q44]

1. .perl [Option ID = 37201]
2. .prl [Option ID = 37202]
3. .pl [Option ID = 37203]
4. .pp [Option ID = 37204]

45) If a language has the capability to produce new data types, then it is said to be

[Question ID = 16802][Question Description = 145_61_BIF_SEP22_Q45]

1. reprehensible [Option ID = 37205]
2. extensible [Option ID = 37206]
3. encapsulated [Option ID = 37207]
4. overloaded [Option ID = 37208]

46) What will be printed by executing the Perl code below?

```
my $val = {};  
  
print ref($val);
```

[Question ID = 16803][Question Description = 146_61_BIF_SEP22_Q46]

1. SCALAR [Option ID = 37209]
2. ARRAY [Option ID = 37210]
3. HASH [Option ID = 37211]
4. Empty value [Option ID = 37212]

47) Various kinds of operators used in C++ are given below:

- A. assignment
- B. arithmetic
- C. conditional
- D. logical
- E. relational
- F. unary

Choose the *correct order* of precedence (from highest to lowest) for the above operators from the options given below.

[Question ID = 16804][Question Description = 147_61_BIF_SEP22_Q47]

1. F, B, E, D, C, A [Option ID = 37213]
2. F, B, E, C, D, A [Option ID = 37214]
3. F, B, E, C, A, D [Option ID = 37215]
4. F, B, D, E, C, A [Option ID = 37216]

48) Some statements regarding C++ programming language are given below:

- A. A statement may contain one or more *expressions*, which are sequences of variables and operators that usually evaluate to a specific value.
- B. A function is composed of *statements*, which tell the computer to do something.
- C. Each statement ends with a semicolon.

Choose the *correct* answer from the options given below.

[Question ID = 16805][Question Description = 148_61_BIF_SEP22_Q48]

1. Only A is true [Option ID = 37217]
2. All A, B and C are true [Option ID = 37218]
3. Only A and C are true [Option ID = 37219]
4. Only A and B are true [Option ID = 37220]

49) Statements about decision tree are given below:

Statement I: A decision tree is a hierarchical model for supervised learning where the local region is identified in a sequence of recursive splits through decision nodes with test function.

Statement II: A decision tree is a parametric model in the sense that we assume a parametric form for the class density.

In light of the above statements, choose the *most appropriate* answer from the options given below.

[Question ID = 16806][Question Description = 149_61_BIF_SEP22_Q49]

1. Both Statement I and Statement II are correct [Option ID = 37221]
2. Both Statement I and Statement II are incorrect [Option ID = 37222]
3. Statement I is correct but Statement II is incorrect [Option ID = 37223]
4. Statement I is incorrect but Statement II is correct [Option ID = 37224]

50) Consider the following statements regarding normalization algorithms for high density oligonucleotide array data:

Statement I: The goal of the quantile normalization method is to make the distribution of probe intensities for each array in a set of arrays the same.

Statement II: Cyclic loess approach is based upon the idea of the *M* versus *A* plot, where *M* is the difference in log expression values and *A* is the average of the log expression values.

In light of the above statements, choose the *most appropriate* answer from the options given below.

[Question ID = 16807][Question Description = 150_61_BIF_SEP22_Q50]

1. Both Statement I and Statement II are correct [Option ID = 37225]
2. Both Statement I and Statement II are incorrect [Option ID = 37226]
3. Statement I is correct but Statement II is incorrect [Option ID = 37227]
4. Statement I is incorrect but Statement II is correct [Option ID = 37228]

