

Roll No:

Application No:

Name:

Exam Date: **05-Oct-2020**Exam Time: **09:00-12:00**Examination: **1. Course Code - M. Tech.;M.P.H.;P.G.****Diploma in Bigdata****2. Field of Study - Big Data Analytics (PGDT)****SECTION 1 - SECTION 1****Question No.1 (Question Id - 59)**

In Python, what is the most convenient way to write one long string in file (e.g. text file) ?

- (A) ☐ **open('file.txt','w').write(all_the_text) (Correct Answer)**
- (B) ☐ open(file.txt).write(all_the_text)
- (C) ☐ open('file.txt','wf').write(all_the_text)
- (D) ☐ open(file.txt,'wf').write(all_the_text)

Question No.2 (Question Id - 23)What would be the value of $^{10}C_5 - ^{10}C_1$?

- (A) ☐ 252
- (B) ☐ **242 (Correct Answer)**
- (C) ☐ 625
- (D) ☐ 490

Question No.3 (Question Id - 1)

A protein solution of concentration 0.2 mM has an absorbance of 0.35. Find the concentration of the solution if the absorbance is 0.63 when both of the solutions were measured in the same cuvette.

- (A) ☐ 3.6 mM
- (B) ☐ 36 μ M
- (C) ☐ **360 μ M (Correct Answer)**
- (D) ☐ 36 mM

Question No.4 (Question Id - 32)

For a positive skewed distribution, the value of the mean is :

- (A) ☐ less than median
- (B) ☐ less than mode
- (C) ☐ **greater than median and mode (Correct Answer)**
- (D) ☐ always zero

Question No.5 (Question Id - 42)If a Poisson Variate X is such that $P(X = 1) = P(X = 2)$, then $P(X = 4)$ is :(Given that $e^{-2} = 0.1353$)

- (A) ☐ **0.09 (Correct Answer)**
- (B) ☐ 0.009
- (C) ☐ 0.9
- (D) ☐ 0.0009

Question No.6 (Question Id - 39)The coefficient of correlation between two variables X and Y is 0.75. The covariance is 36. The variance of X is 16. Then the standard deviation of Y (i.e, σ_Y) will be given by

- (A) ☐ 16
(B) ☐ 14
(C) ☒ 12 (Correct Answer)
(D) ☐ 36

Question No.7 (Question Id - 84)

A polymerase chain reaction (PCR) requires :

- (A) ☒ dNTPs, Taq Polymerase and primers (Correct Answer)
(B) ☐ Primers, Restriction endonuclease and dNTPs
(C) ☐ DNA template, taq Polymerase and nuclease
(D) ☐ dNTPs, RNA template and primers

Question No.8 (Question Id - 99)

Which pipeline can be used for the gene prediction in eukaryotic genomes ?

- (A) ☒ Augustus (Correct Answer)
(B) ☒ MAKER (Correct Answer)
(C) ☒ Augustus and MAKER (Correct Answer)
(D) ☐ GRAIL and PYTHIA

Question No.9 (Question Id - 17)

A and B could finish a given piece of work in 10 and 15 days, respectively. They worked together for 3 days and then B left. A finished the rest of the work alone. The total work was finished in :

- (A) ☐ 6 days
(B) ☒ 8 days (Correct Answer)
(C) ☐ 13 days
(D) ☐ 9 days

Question No.10 (Question Id - 47)

How is variance affected if each observation of a set is divided by 10 ?

- (A) ☐ $\frac{1}{10}$
(B) ☒ $\frac{1}{100}$ (Correct Answer)
(C) ☐ $\frac{1}{1000}$
(D) ☐ 10^2

Question No.11 (Question Id - 53)

In C, how many arguments fseek() function takes ?

- (A) ☐ 2
(B) ☐ 4
(C) ☒ 3 (Correct Answer)
(D) ☐ 1

Question No.12 (Question Id - 89)

How many possible number of phylogenetic trees can be made with four sequences ?

- (A) ☒ 3 (Correct Answer)
(B) ☐ 16
(C) ☐ 24
(D) ☐ 6

Question No.13 (Question Id - 81)

- (A) ☐ 3
 (B) ☒ 4 (Correct Answer)
 (C) ☐ 2
 (D) ☐ 5

Question No.14 (Question Id - 35)

For a moderately skew distribution, what relationship between mean, median and mode exists ?

- (A) ☒ Mean - Mode = 3(Mean - Median) (Correct Answer)
 (B) ☐ Mean + Mode = 3(Mean + Median)
 (C) ☐ 2(Mean - Mode) = 3(Mean - Median)
 (D) ☐ 3(Median - Mean) = 4(Mean - Median)

Question No.15 (Question Id - 29)

The probability of no cars arriving in a 10 minutes interval is 0.4. Find the probability of at least one car arriving in that 10 minutes interval.

- (A) ☐ 0.1
 (B) ☐ 0.5
 (C) ☐ 0.4
 (D) ☒ 0.6 (Correct Answer)

Question No.16 (Question Id - 86)

A protein was found to be localized in plasma membrane of the cell. What could be possible function of the protein ?

- (A) ☐ Transcription factor
 (B) ☒ Receptor (Correct Answer)
 (C) ☐ Protein degradation
 (D) ☐ Translation

Question No.17 (Question Id - 74)

In C, what is the value of sizeof(float) ?

- (A) ☐ 3
 (B) ☒ 4 (Correct Answer)
 (C) ☐ 5
 (D) ☐ 6

Question No.18 (Question Id - 70)

In C, if we provide 75.50 to scanf() function, what value this function accept ?

- (A) ☐ 75.50
 (B) ☒ 75 (Correct Answer)
 (C) ☐ 75.5
 (D) ☐ 75.5000

Question No.19 (Question Id - 44)

In five tossings of a fair coin, find the chances of getting 4 heads.

- (A) ☒ ${}^5C_4 \left(\frac{1}{2}\right)^4 \left(\frac{1}{2}\right)^1$ (Correct Answer)
 (B) ☐ ${}^5C_4 \left(\frac{1}{2}\right)^3 \left(\frac{1}{2}\right)^3$

(C) ☐ ${}^5C_2 \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)$

(D) ☐ ${}^5C_2 \left(\frac{1}{2}\right)^5 \left(\frac{1}{2}\right)^2$

Question No.20 (Question Id - 48)

If a r.v $X \sim N(40, 5^2)$, find the probability for the values of X specified as $31 \leq X \leq 35$.
Given the areas $\phi(Z)$ from 0 to Z :

Z	0.8	1.0	1.6	1.8	2.0	3.0
$\phi(Z)$	0.28814	0.34134	0.35543	0.46407	0.47725	0.49865

(A) ☒ **0.12273 (Correct Answer)**

(B) ☐ 0.2273

(C) ☐ 0.33373

(D) ☐ 0.00537

Question No.21 (Question Id - 20)

Find the least number which when divided by any of 42, 36 and 54 respectively leaves 17 as remainder.

(A) ☐ 2268

(B) ☐ 2251

(C) ☒ **2285 (Correct Answer)**

(D) ☐ 13625

Question No.22 (Question Id - 3)

Find the value of the expression $\cos 105^\circ + \sin 135^\circ$:

(A) ☐ $\frac{1-\sqrt{3}}{2\sqrt{2}}$

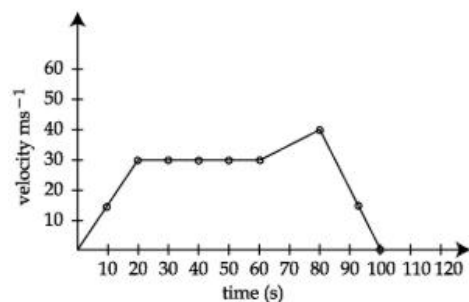
(B) ☒ $\frac{3-\sqrt{3}}{2\sqrt{2}}$ **(Correct Answer)**

(C) ☐ $\frac{\sqrt{3}-3}{2\sqrt{2}}$

(D) ☐ $\frac{\sqrt{3}-1}{\sqrt{2}}$

Question No.23 (Question Id - 19)

If the running profile of a runner is represented by the graph provided here, find the total distance travelled by the runner in the total time of 100 s.



(A) ☐ 2000 m

(B) ☐ 2400 m

(C) ☒ **2600 m (Correct Answer)**

Question No.24 (Question Id - 4)

Find the hexadecimal equivalent of the number 621.

- (A) ☐ D62
 (B) ☐ 2D6
 (C) ☒ **26D (Correct Answer)**
 (D) ☐ 2613

Question No.25 (Question Id - 14)

A bucket contains 40 litres of water. At a first instance, $\frac{2}{5}$ th of the water was taken out. Afterwards, $\frac{3}{8}$ th of the remaining water was again taken out. What would be the amount of water still remaining in the bucket ?

- (A) ☐ 25 litres
 (B) ☐ 1 litre
 (C) ☒ **15 litres (Correct Answer)**
 (D) ☐ 6 litres

Question No.26 (Question Id - 65)

In C, the syntax of opening a file in standard I/O package is :

- (A) ☒ **f ptr = f open("file", "mode"); (Correct Answer)**
 (B) ☐ f ptr = f openfile('filename', 'mode');
 (C) ☐ f ptr = f open(file && mode);
 (D) ☐ f ptr = f openfile(file=mode);

Question No.27 (Question Id - 45)

If X and Y are two poisson variates such $X \sim P(1)$ and $Y \sim P(2)$, the probability $P(X + Y < 3)$ is :

- (A) ☐ $3e^{-3}$
 (B) ☒ **e^{-3} (Correct Answer)**
 (C) ☐ $4e^{-3}$
 (D) ☐ $2e^{-1}$

Question No.28 (Question Id - 54)

How we can reduce the loop execution time in C ?

- (A) ☒ **Avoid using expressions inside a loop which are independent of the loop. (Correct Answer)**
 (B) ☐ Incorporate the nested loop inside the loop.
 (C) ☐ Avoid using expression outside the loop.
 (D) ☐ Incorporate several variables inside the loop which are independent of the loop.

Question No.29 (Question Id - 7)

A car is moving at a constant speed of 72 km/hr. At a crossing when the car was at a distance of 400 m, the timer at the signal was showing 8 s left for turning red. Find the acceleration of the car by which it has to be accelerated to cross the signal.

- (A) ☐ 6.03 ms^{-2}
 (B) ☐ 2.03 ms^{-1}
 (C) ☐ 6.03 ms^{-1}
 (D) ☒ **2.03 ms^{-2} (Correct Answer)**

Question No.30 (Question Id - 21)

A square and an equilateral triangle each have sides of

length 6. What is the ratio of the area of the square to the area of the triangle ?

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- (A) ☐ $\frac{4}{3}$
- (B) ☐ $\frac{16}{9}$
- (C) ☐ $\frac{\sqrt{3}}{4}$
- (D) ☒ $4\sqrt{3}$ (Correct Answer)

Question No.31 (Question Id - 69)

In Python, dir() function defines :

- (A) ☒ A list of all the articles associated with a type (Correct Answer)
- (B) ☐ A list of all the integers
- (C) ☐ Type of attribute
- (D) ☐ Sum of all the integers

Question No.32 (Question Id - 25)

If $2 \times 3 = \sqrt{13}$ and $3 \times 4 = 5$, then the value of 5×12 is :

- (A) ☐ 15
- (B) ☐ $\sqrt{17}$
- (C) ☒ 13 (Correct Answer)
- (D) ☐ 12

Question No.33 (Question Id - 31)

The area under the normal curve within its range $-\infty$ to ∞ is always :

- (A) ☐ less than 1
- (B) ☐ greater than 1
- (C) ☒ unity (Correct Answer)
- (D) ☐ cannot determine

Question No.34 (Question Id - 8)

At 27°C and 750 mm of Hg pressure, a gas occupies 600 ml volume. Calculate the pressure at a height where temperature is 7°C and volume of the gas is 700 ml.

- (A) ☐ 650 mm of Hg
- (B) ☐ 802 mm of Hg
- (C) ☒ 600 mm of Hg (Correct Answer)
- (D) ☐ 620 mm of Hg

Question No.35 (Question Id - 73)

What is the description of function mktime(tuple) in Python ?

- (A) ☐ Converts a time tuple to a string
- (B) ☐ Converts seconds to a date tuple, local time
- (C) ☐ Sleeps for secs seconds
- (D) ☒ Converts a time tuple to local time (Correct Answer)

Question No.36 (Question Id - 26)

Let $(X_i, Y_i); i = 1, 2, \dots, n$ be n pairs of observations and ρ be the correlation coefficient of X and Y .

The standard error is :

- (A) ☐

- ☐ $\sqrt{\frac{1-p^2}{n}}$
 (B) ☐ $\sqrt{\frac{1-p^2}{n-1}}$
 (C) ☐ $\left(\frac{1-p^2}{n}\right)$
 (D) ☒ $\left(\frac{1-p^2}{\sqrt{n}}\right)$ **(Correct Answer)**

Question No.37 (Question Id - 92)

The Bacterial cell is called competent cell if :

- (A) ☐ It competes with virus
 (B) ☐ It multiply at a faster rate
 (C) ☒ **It's ready to take foreign DNA and get transformed (Correct Answer)**
 (D) ☐ It does not allow any foreign DNA to enter

Question No.38 (Question Id - 30)

Karl Pearson's formula for a wide class of frequency distributions in terms of moments that is only the measure of skewness but not the direction of skewness is given by :

- (A) ☒ $\beta_1 = \frac{\mu_3^2}{\mu_2^3}$ **(Correct Answer)**
 (B) ☐ $\beta_1 = \frac{\mu_2^3}{\mu_3^2}$
 (C) ☐ $\beta_1 = \frac{\mu_2}{\mu_3}$
 (D) ☐ $\beta_1 = \frac{\mu_3^2}{\mu_4}$

Question No.39 (Question Id - 10)

The equation of a straight line perpendicular to the given line $2x - 3y + 6 = 0$ and passing through the point (2, 3) is given by :

- (A) ☐ $2x + 3y - 12 = 0$
 (B) ☒ **$3x + 2y - 12 = 0$ (Correct Answer)**
 (C) ☐ $2x + 3y + 18 = 0$
 (D) ☐ $3x - 2y + 18 = 0$

Question No.40 (Question Id - 61)

What would be the output of the following program in python?

- ```
>>> import date time
>>> NewYearsDay=datetime.date(2020, 01, 01)
>>> NewYearsEve=datetime.date(2019, 12, 31)
>> Oneday=NewYearsDay-NewYearsEve
>>> print oneday
```
- (A) ☐ 1 Year, 1 : 00 : 00  
 (B) ☐ 0 day, 0 : 00 : 00  
 (C) ☒ **1 day, 0 : 00 : 00 (Correct Answer)**  
 (D) ☐ 2 day, 0 : 00 : 00

**Question No.41 (Question Id - 64)**

In C, what would be the statement for redefine the data types ?

- (A) ☐ type diff  
 (B) ☐ type diff  
 (C) ☐ type define  
 (D) ☐ **type def (Correct Answer)**

**Question No.42 (Question Id - 80)**

DNA in chromatin is known to be associated with histone to form nucleosomes. Histones are rich in which of the following amino acids ?

- (A) ☐ Asp, Glu  
 (B) ☐ **Lys, Arg (Correct Answer)**  
 (C) ☐ Gly, Prol  
 (D) ☐ Ser, Thr

**Question No.43 (Question Id - 52)**

The below question has been dropped and full marks are awarded.

What would be the output of following in Python ?

```
>>> temp=s['x']
>>> temp.append('d')
>>> s['x']=temp
>>> s['x']
```

- (A) ☐ ['a', 'b', 'c', 'd']  
 (B) ☐ ['a', 'b', 'c']  
 (C) ☐ ['d', 'c', 'b', 'a']  
 (D) ☐ ['d', 'a', 'b', 'c']

**Question No.44 (Question Id - 71)**

In C, float a[3][3]={{{1, 2, 3}, {4, 6, 9}, {3, 2, 7}}} what would be the value of a[2][0] ?

- (A) ☐ 2  
 (B) ☐ **3 (Correct Answer)**  
 (C) ☐ 6  
 (D) ☐ 1

**Question No.45 (Question Id - 93)**

Consider a B<sup>+</sup> tree in which the maximum number of keys in a node is 7. What is the minimum number of keys in any non-root node ?

- (A) ☐ 1  
 (B) ☐ **3 (Correct Answer)**  
 (C) ☐ 2  
 (D) ☐ 4

**Question No.46 (Question Id - 11)**

Find the determinant of the following matrix :

$$\begin{bmatrix} 4 & 10 & 12 \\ 3 & 2 & 9 \\ 7 & 12 & 21 \end{bmatrix}$$

- (A) ☐ 1  
 (B) ☐ 132  
 (C) ☐ 161  
 (D) ☐ **0 (Correct Answer)**

Question No.47 (Question Id - 50)

A machine part is produced by three factories  $F_1$ ,  $F_2$  and  $F_3$ . Their proportional production are 25%, 35% and 40% respectively. Also, the percentage defectives manufactured by three factories are 5, 4 and 3 respectively. A part is taken at random and is found to be defective, then the probability that the selected part belongs to factory  $F_2$  is :

- (A) ☒  $\frac{28}{77}$  (Correct Answer)
- (B) ☐  $\frac{5}{11}$
- (C) ☐  $\frac{11}{12}$
- (D) ☐  $\frac{1}{11}$

Question No.48 (Question Id - 75)

In Python, what will be the output of the following command ?

```
>>> d={'a': 5, 'b': 6, 'c': 7}
>>> print sub_dict(d, 'ab'), d
```

- (A) ☒ {'a': 5, 'b': 6}{'a': 5, 'b': 6, 'c': 7} (Correct Answer)
- (B) ☐ {5, 6}{5, 6, 7}
- (C) ☐ {'a': 5, 'b': 6}{'c': 7}
- (D) ☐ {'a': 5, 'b': 6, 'c': 7}{'a': 5, 'b': 6}

Question No.49 (Question Id - 100)

One of the following is **not** useful for phylogenetic analysis :

- (A) ☐ PAUP
- (B) ☐ MacClade
- (C) ☒ RASMOL (Correct Answer)
- (D) ☐ PHYLIP

Question No.50 (Question Id - 37)

Two fair standard four sided dices are rolled. Find the probability that the sum is greater than 6.

- (A) ☒  $\frac{5}{9}$  (Correct Answer)
- (B) ☐  $\frac{4}{16}$
- (C) ☐  $\frac{1}{16}$
- (D) ☐  $\frac{6}{16}$

Question No.51 (Question Id - 43)

Given that  $P(A) = \frac{3}{4}$ ,  $P(B) = \frac{1}{3}$  and  $P(A \cup B) = \frac{11}{12}$  probability,  $P(A | B)$  is :

- (A) ☒  $\frac{1}{2}$  (Correct Answer)
- (B) ☐  $\frac{1}{4}$
- (C) ☐  $\frac{1}{9}$
- (D) ☐  $\frac{4}{9}$

Question No.52 (Question Id - 87)

Which of the following is not used for predicting a gene in an assembled eukaryotic genome ?

- (A) ☐ ORF Location  
(B) ☐ Promoter Location  
(C) ☐ Exon-Intron splice junction  
(D) ☐ **Enhancer Location (Correct Answer)**

**Question No.53 (Question Id - 88)**

In an RNA-seq data having 50 fusion transcripts (already known), a tool detected only 20 fusion transcripts. What is the sensitivity of the tool ?

- (A) ☐ 50%  
(B) ☐ **40% (Correct Answer)**  
(C) ☐ 20%  
(D) ☐ 30%

**Question No.54 (Question Id - 18)**

60 mL of 30 mM NaCl solution was mixed with 10 ml of 0.24 M another NaCl solution. The final concentration of the NaCl in the solution is :

- (A) ☐ 68 mM  
(B) ☐ 120 mM  
(C) ☐ **60 mM (Correct Answer)**  
(D) ☐ 0.03 M

**Question No.55 (Question Id - 62)**

In Python, mystr = "my string", then mystr[4:] will print :

- (A) ☐ string  
(B) ☐ **tring (Correct Answer)**  
(C) ☐ my s  
(D) ☐ my st

**Question No.56 (Question Id - 58)**

Which of the I/O function will **not** returns a character that has been recently typed in C ?

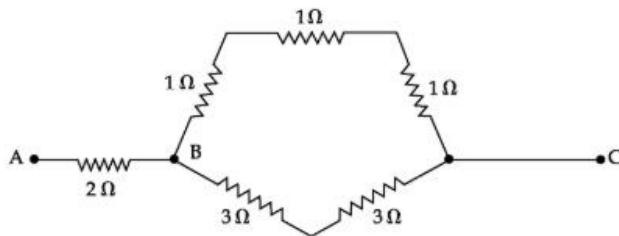
- (A) ☐ **getcho( ) (Correct Answer)**  
(B) ☐ getch( )  
(C) ☐ getche( )  
(D) ☐ getchar( )

**Question No.57 (Question Id - 97)**

One of the following is a typical example of negative feedback gene regulatory network :

- (A) ☐ **P53-MDM2 (Correct Answer)**  
(B) ☐ ROS-MDM2  
(C) ☐ CDC-P53  
(D) ☐ C-myc-MDM2

**Question No.58 (Question Id - 5)**



- (A) ☐ 11  $\Omega$   
 (B) ☒ 4  $\Omega$  (Correct Answer)  
 (C) ☐ 8  $\Omega$   
 (D) ☐ 6  $\Omega$

**Question No.59 (Question Id - 96)**

An antibiotic does not induce antibody production, however, it binds to serum protein and forms a complex that in some people induce antibody formation resulting in an allergic reaction. The antibiotic is :

- (A) ☒ a hapten (Correct Answer)  
 (B) ☐ an antigen  
 (C) ☐ an immunogen  
 (D) ☐ none of the above

**Question No.60 (Question Id - 41)**

A student guesses randomly the answers to a multiple-choice exam. There are twenty questions and each has four possible answers. If  $X$  is the number of questions the student answers correctly, the mean and standard deviation of  $X$  are :

- (A) ☐ (5, 1.94)  
 (B) ☒ (4, 1.79) (Correct Answer)  
 (C) ☐ (20, 5)  
 (D) ☐ (10, 3.79)

**Question No.61 (Question Id - 38)**

The probability of a randomly chosen individual in a society being male is 0.52. The probability of the individual being of Indian origin is 0.18. Find the probability of individuals being male of Indian origins.

- (A) ☐ 0.80  
 (B) ☒ 0.0936 (Correct Answer)  
 (C) ☐ 0.90  
 (D) ☐ 0.50

**Question No.62 (Question Id - 68)**

In C, what would be the valid subscript range for `int a[100]` array declaration statement in C ?

- (A) ☐ 0 to 100  
 (B) ☐ 1 to 99  
 (C) ☒ 0 to 99 (Correct Answer)  
 (D) ☐ 1 to 100

**Question No.63 (Question Id - 34)**

How to ascertain Kurtosis with the help of  $\beta_2$ , if  $\beta_2 = 3.3, 2.8$ .

- (A) ☒ Curve is leptokurtic at  $\beta_2 = 3.3$  and platykurtic at  $\beta_2 = 2.8$  (Correct Answer)  
 (B) ☐ Curve is mesokurtic and platykurtic respectively

- (C) ☐ Curve is platykurtic and leptokurtic  
(D) ☐ Curve is mesokurtic only

**Question No.64 (Question Id - 28)**

For a negative skewed distribution, the value of the mode is :

- (A) ☒ **greater than median and mean (Correct Answer)**  
(B) ☐ less than median and mean  
(C) ☐ always negative and less than median  
(D) ☐ greater than mean and less than mode

**Question No.65 (Question Id - 36)**

Geometric mean of first n natural numbers is given by :

- (A) ☐  $G = (x_1 + x_2 + \dots + x_n)^n, x_i \in \mathbb{N}$   
(B) ☐  $G = \left( \frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n} \right)^{\frac{1}{n}}, x_i \in \mathbb{N}$   
(C) ☒  **$G = (x_1 \cdot x_2 \cdot x_3 \dots x_n)^{1/n}, x_i \in \mathbb{N}$  (Correct Answer)**  
(D) ☐  $G = (x_1 + x_2 + x_3 + \dots + x_n)^{1/n}$

**Question No.66 (Question Id - 85)**

Given below are two statements :

**Statement I:**

Long non-coding RNAs (lncRNAs) are produced by RNA Polymerase III.

**Statement II:**

Long non-coding RNAs (lncRNAs) are usually longer than 200 nucleotides.

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

- (A) ☐ Both **Statement I** and **Statement II** are true.  
(B) ☐ Both **Statement I** and **Statement II** are false.  
(C) ☐ **Statement I** is correct but **Statement II** is false.  
(D) ☒ **Statement I is incorrect but Statement II is true. (Correct Answer)**

**Question No.67 (Question Id - 91)**

Which statements are TRUE about an SQL Query ?

- P. An SQL query can contain a HAVING clause even if it does not have a GROUP BY clause.  
Q. An SQL query can contain a HAVING clause only if it has a GROUP BY clause.  
R. All attributes used in the GROUP BY clause must appear in the SELECT clause.  
S. Not all attributes used in the GROUP BY clause need to appear in the SELECT clause.

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

- (A) ☐ P and R  
(B) ☒ **Q and R (Correct Answer)**  
(C) ☐ P and S  
(D) ☐ Q and S

**Question No.68 (Question Id - 12)**

$$\int_1^2 (3x^2 + 6)(x^3 + 6x) dx$$

- (A) ☐ 200  
 (B) ☐ 151  
 (C) ☒ **175.5 (Correct Answer)**  
 (D) ☐ 6.5

**Question No.69 (Question Id - 46)**

If  $f(x) = \frac{2}{\sqrt{\pi}} e^{-4x^2}$ ,  $-\infty < x < \infty$  is the pdf of a normal distribution, then variance is :

- (A) ☐  $\frac{1}{\sqrt{2}}$   
 (B) ☐  $\frac{1}{2}$   
 (C) ☐  $\frac{1}{4}$   
 (D) ☒  **$\frac{1}{8}$  (Correct Answer)**

**Question No.70 (Question Id - 95)**

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A:**

CaMV35S promoter is frequently used for plant transformation.

**Reason R:**

CaMV35S is tissue-specific promoter.

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

- (A) ☐ Both **A** and **R** are correct and **R** is the correct explanation of **A**.  
 (B) ☐ Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**.  
 (C) ☒ **A is correct but R is not correct. (Correct Answer)**  
 (D) ☐ **A** is not correct but **R** is correct.

**Question No.71 (Question Id - 40)**

If a random variable X has the mean 5 and standard deviation 3, then the variance of the variable  $Y = (3X - 11)$  is :

- (A) ☐ 9  
 (B) ☐ 25  
 (C) ☒ **81 (Correct Answer)**  
 (D) ☐ 144

**Question No.72 (Question Id - 51)**

What would be the value of  ${}^nC_r$  ?

- (A) ☒  **$n!/r!(n-r)!$  (Correct Answer)**  
 (B) ☐  $n!/r!(n+r)!$   
 (C) ☐  $r!/n!(n-r)!$   
 (D) ☐  $r!/n!(n+r)!$

**Question No.73 (Question Id - 78)**
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An intermediate structure in homologous recombination in which the two duplexes of DNA are connected by the genetic material exchanged between two of the four strands is called :

- (A) ☐ Recombination hotspot  
 (B) ☒ **Holiday junction (Correct Answer)**  
 (C) ☐ Crossing junction  
 (D) ☐ Duplex point

**Question No.74 (Question Id - 22)**

If x is negative, which of the following statement must be true ?

- (A) ☐  $x^2 < x^4$   
 (B) ☒  **$x^3 < x^2$  (Correct Answer)**  
 (C) ☐  $x + \frac{1}{x} < 0$   
 (D) ☐  $x = \sqrt{x^2}$

**Question No.75 (Question Id - 55)**

What will following program in Python print ?

```
x=1.234567890987654321000001
y=round(x, 3)
print(x)
print(y)
```

- (A) ☒ **1.2345678909876543 & 1.234 (Correct Answer)**  
 (B) ☐ 1.234 & 1.234  
 (C) ☐ 1.23456789 & 1.234  
 (D) ☐ 1.2345 & 1.23

**Question No.76 (Question Id - 16)**

The sides of a given triangle are 10, 18 and 12 units, respectively. Find the length of the perpendicular drawn from the opposite angle on the largest side.

- (A) ☒ **6.2844 (Correct Answer)**  
 (B) ☐ 12.568  
 (C) ☐ 3.1422  
 (D) ☐ 0.6284

**Question No.77 (Question Id - 57)**

Which of the following is **not** the decision making statement in C ?

- (A) ☐ if-else statement  
 (B) ☒ **do-while statement (Correct Answer)**  
 (C) ☐ switch statement  
 (D) ☐ else-if construct

**Question No.78 (Question Id - 15)**

If ₹ 336 is divided between A and B in such a way that A gets  $\frac{5}{16}$ <sup>th</sup> of the amount B gets, How much would A and B get ?

- (A) ☒ **A gets ₹ 80 and B gets ₹ 256 (Correct Answer)**  
 (B) ☐ A gets ₹ 256 and B gets ₹ 80  
 (C) ☐ A gets ₹ 96 and B gets ₹ 240  
 (D) ☐ A gets ₹ 240 and B gets ₹ 96

**Question No.79 (Question Id - 94)**
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Models of substitution are used in evolutionary studies. One of the model called "Kimura" considers \_\_\_\_\_ parameters.

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- (A) ☐ three  
 (B) ☐ one  
 (C) ☒ **two (Correct Answer)**  
 (D) ☐ zero

**Question No.80 (Question Id - 2)**

If 30 ml of 20 mM solution of a solute having molecular weight 300 is mixed with 3% of 70 ml of the solution of the same solute. Find the molarity of the resultant solution.

- (A) ☐ 0.12 M  
 (B) ☐ 7.60 mM  
 (C) ☐ 0.76 M  
 (D) ☒ **0.076 M (Correct Answer)**

**Question No.81 (Question Id - 27)**

What would be the weighted mean of first 10 natural numbers if weights are the corresponding numbers.

- (A) ☐  $\frac{19}{3}$   
 (B) ☒  $\frac{21}{3}$  **(Correct Answer)**  
 (C) ☐  $\frac{20}{3}$   
 (D) ☐  $\frac{25}{3}$

**Question No.82 (Question Id - 33)**

Based on data with x values between 10 and 20 and a correlation coefficient of 0.93, a regression line is given by  $y = 10.2x - 5.3$ . What are the prediction values of y, when  $x = 3.13$  ?

- (A) ☒ **25.3, 127.3 (Correct Answer)**  
 (B) ☐ 20.3, 126  
 (C) ☐ 10.3, 120  
 (D) ☐ 20.8, 120.9

**Question No.83 (Question Id - 66)**

What would be the output of the following command in Python ?

```
>>> digits_only = translator(keep=string.digits)
>>> digits_only= ('My Height : 124.85 cm') will print as
```

- (A) ☐ 124.85  
 (B) ☐ 124.8  
 (C) ☐ 124  
 (D) ☒ **12485 (Correct Answer)**

**Question No.84 (Question Id - 67)**

What will be the output of the following program in Python ?

```
>>> seq=[34, 67, 8, 123, 4, 100, 95]
>>> seq.sort()
>>> search(seq, 34)
```

- (A) ☐ 3  
 (B) ☐ 34  
 (C) ☒ **2 (Correct Answer)**

**Question No.85 (Question Id - 77)**

Which set of tools can be used for comparing two genomes ?

- (A) ☐ BLAST, GENSCAN, BLAT  
(B) ☐ BLAT, Mummer and InterPro  
(C) ☐ BLAST, InterPro and GENSCAN  
(D) ☐ **BLAST, Mummer and BLAT (Correct Answer)**

**Question No.86 (Question Id - 63)**

What would be the output of the following command in Python ?

>>>print 'JNU Examination'.title( )

- (A) ☐ JNU EXAMINATION  
(B) ☐ JNU Examination  
(C) ☐ **Jnu Examination (Correct Answer)**  
(D) ☐ Jnu examination

**Question No.87 (Question Id - 79)**

Which of the following proteins acts as a checkpoint control for entry into S-phase of DNA replication ?

- (A) ☐ Cyclin/CDK  
(B) ☐ **p53 (Correct Answer)**  
(C) ☐ cdc25  
(D) ☐ p21

**Question No.88 (Question Id - 56)**

For the following program written in Python :

>>>values=1,2,3

>>>x, y, z = values

What will be the output of >>>x ?

- (A) ☐ **1 (Correct Answer)**  
(B) ☐ 3  
(C) ☐ values  
(D) ☐ x

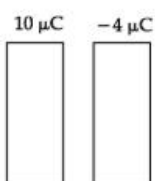
**Question No.89 (Question Id - 98)**

Which of the following techniques is 'NOT' used for gene expression analysis ?

- (A) ☐ DNA Microarrays  
(B) ☐ **Southern Hybridization (Correct Answer)**  
(C) ☐ Northern hybridization  
(D) ☐ Quantitative real-time PCR

**Question No.90 (Question Id - 9)**

Two metal plates are placed side by side and parallel to each other and charges are given to the plates as shown in the figure below :



The charge distribution on the sides of the plate from left to right will be :

- (A) ☐  $+5 \mu\text{C}, +5 \mu\text{C}, -2 \mu\text{C}, -2 \mu\text{C}$   
 (B) ☐  $+5 \mu\text{C}, -5 \mu\text{C}, +2 \mu\text{C}, -2 \mu\text{C}$   
 (C) ☐  $+3 \mu\text{C}, -3 \mu\text{C}, -7 \mu\text{C}, +3 \mu\text{C}$   
 (D) ☐  **$+3 \mu\text{C}, +7 \mu\text{C}, -7 \mu\text{C}, +3 \mu\text{C}$  (Correct Answer)**

**Question No.91 (Question Id - 90)**

Amino acids like Leu, Ile, Val, Phe etc., tend to cluster near core of globular proteins as :

- (A) ☐ these amino acids prefer  $\beta$ -sheet structure.  
 (B) ☐ these amino acids can form additional hydrogen bonds involving their side chains.  
 (C) ☐ these prefer definite three dimensional structure.  
 (D) ☐ **these avoid contact with water. (Correct Answer)**

**Question No.92 (Question Id - 24)**

Find the average of first 20 multiples of 7.

- (A) ☐ 71.5  
 (B) ☐ 75.3  
 (C) ☐ 74.5  
 (D) ☐ **73.5 (Correct Answer)**

**Question No.93 (Question Id - 82)**

"Melting" of a protein primarily affects the :

- (A) ☐ Primary Structure  
 (B) ☐ **Secondary Structure (Correct Answer)**  
 (C) ☐ Sequence of the protein  
 (D) ☐ None of the above

**Question No.94 (Question Id - 6)**

If an object is placed at a distance of 8 cm from a convex mirror of focal length 12 cm. Find the position and nature of the image.

- (A) ☐ 4.8 cm, real and inverted  
 (B) ☐ 4.8 cm, virtual and inverted  
 (C) ☐ **4.8 cm, virtual and erect (Correct Answer)**  
 (D) ☐ 4.8 cm, real and erect

**Question No.95 (Question Id - 60)**

Which of the following category is of non-executable statement in C ?

- (A) ☐ Assignment  
 (B) ☐ **Comment (Correct Answer)**  
 (C) ☐ Control  
 (D) ☐ Input/Output

**Question No.96 (Question Id - 13)**

How many three digit numbers can be made with the numbers 1 to 9, if repetition is not allowed ?

- (A) ☐ 729  
 (B) ☐ **504 (Correct Answer)**  
 (C) ☐ 576  
 (D) ☐ 720

**Question No.97 (Question Id - 72)**

string.Template class is offered in which version of Python ?

- (A) ☐ 2.1

- (B) ☐ 2.2  
(C) ☐ 2.3  
(D) ☒ 2.4 (Correct Answer)

**Question No.98 (Question Id - 49)**

The minimum number of tosses of a coin that are needed so that the probability of getting at least one head being 0.875 is :

- (A) ☐ 4  
(B) ☒ 3 (Correct Answer)  
(C) ☐ 8  
(D) ☐ 6

**Question No.99 (Question Id - 76)**

Given below are two statements :

**Statement I:**

First worm sequenced was *Caenorhabditis elegans*.

**Statement II:**

Genome size of *C. elegans* is 97 Mb.

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

- (A) ☒ Both Statement I and Statement II are true. (Correct Answer)  
(B) ☐ Both Statement I and Statement II are false.  
(C) ☐ Statement I is correct but Statement II is false.  
(D) ☐ Statement I is incorrect but Statement II is true.

**Question No.100 (Question Id - 83)**

Which of the following are the methods to find the evolutionary tree that best accounts for the observed variation in a group of sequences ?

- (A) ☒ Maximum Parsimony, Distance and Maximum Likelihood (Correct Answer)  
(B) ☐ Maximum Likelihood, Maximum Parsimony and Hierarchical Clustering  
(C) ☐ Principal Component Analysis, Distance and Maximum Parsimony  
(D) ☐ Principal Component Analysis, Maximum Likelihood and Maximum Parsimony

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