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बडा लालपुर, चांदमारी, सिंधोरा रोड, वाराणसी

Section A General Aptitude**Question Numbers: (1 to 5)**

Question Label: Comprehension

Read the passage and answer the questions that follow

The opportunity that beckons India is to make optimal use of technology, management, entrepreneurship and investments to overcome the challenges of this decade and beyond. Yesterday's goals Cannot be a benchmark as India contemplates graduating to the company of the developed nations of the world. Our targets must be higher, our coverage more inclusive and above all, the methods to achieve must be unique.

Since Independence, India as a nation has indeed made massive progress in almost every social and economic field. But as we strive to have an economically developed nation by 2020. Each incremental step opens up new vistas before us. After every few pages, we mark our place in history, heading for a new chapter of challenges not experienced earlier.

Following a steady decline in world income — from about 33 percent in 0 CE to around 25 percent in 1600 CE — India's share declined even further during the British Raj, falling sharply from about 16 per cent in 1820 CE, to less than 4 per cent at the time of Independence. Since Independence, there has been a steady rise in income, and the per capita national product has increased by more than five times, from Rs. 5,700 in 1950 to about Rs. 32,000 in 2008, and today, India's share in world income — purchasing power parity (PPP) — stands at about 6.3 percent But while the economy has been growing steadily and poverty, as a percentage, declining steadily, the absolute number of people below the poverty line has been constant.

Sub questions

1. According to the passage, use of the phrase "make optimal use of" means:
(a) Set a higher benchmark for growth.
(b) Using the methods effectively and efficiently.
(c) Experiment with new challenges.
(d) Mark our place in history.

2. Which word in the given passage means "without interruption"?
(a) Consistent
(b) Steady
(c) Optimal
(d) Constant

3. What does India need to become a developed nation?
A. Take rapid and incremental steps towards progress.
B. Contemplate on only yesterday's goals.
C. Make thoughtful usage of technology in various fields.
D. Work steadily on economic indicators.
E. Set higher, inclusive and unique targets.

Choose the CORRECT answer from the options given below:

- (a) A, B, C only.
- (b) B, D, E, only.
- (c) A, D, E only.
- (d) C D, E only.

4. Given below are two statements:

Statement A: Since Independence, there has been a steady rise in income and the increase of per capita national product by five times from 5,700 in 1947 to about 32000 in 2008.

Statement B: Poverty has declined while the economy has grown but the absolute number of people below poverty line has been constant.

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

- (a) Both Statement A and Statement B are correct.
- (b) Both Statement A and Statement B are incorrect.
- (c) Statement A is correct but Statement B is incorrect.
- (d) Statement A is incorrect but Statement B is correct.

5. Read the given passage and Match List I with List II.

	List I (India's share in world GDP)		List II (Year)
A	16 percent	i	0CE
B	33 percent	ii	1820 CE
C	25 percent	iii	1947 CE
D	4 percent	iv	1600 CE

Choose the CORRECT options given below:

- (a) A-i, B-ii, C-iv, D-iii
- (b) A-iii, B-ii, C-i, D-iv
- (c) A-ii, B-i, C-iv, D-iii
- (d) A-iv, B-ii, C-iii, D-i

Question Numbers: (6 to 10)

Question Label: Comprehension

Read the following passage and answer the questions that follow:

Let us discuss coal, another fossil fuel. Even though India has abundant quantities of coal, it is constrained by regional locations, a high ash content that affects the thermal efficiency of our power plants, besides which there are also environmental concerns. Thus, a movement towards energy independence would demand accelerated work in the production of energy from the coal sector through integrated gasification and a combined cycle route.

In 2030, the total energy requirement of the nation is expected to be 4,00,000 MW. By that time, if we were to follow the present route, the power generated from coal-based power plants would increase from the existing 80,000 MW to 2,00,000 MW. This would demand a significant build-up of thermal power stations and a large-scale expansion of coal fields, leading, naturally, to much higher levels of pollution.

The hydel capacity generated through normal water sources and by the interlinking of rivers is expected to contribute an additional 50,000 MW- Numerous large-scale solar energy farms with a capacity of hundreds of megawatts could together contribute around 55,000 MW. The nuclear power plants should have a target of 50,000 MW of power. At least 64,000 MW of electrical power should come from wind energy. The balance 51,000 MW has to be generated through conventional thermal plants, through coal and gas, and renewable sources of energy such as biomass, through municipal solid waste and solar thermal power. The most significant aspect, however, is that the power generated through renewable energy technologies has to be increased to 28 percent from the present 5 percent.

Sub questions

- 6. To meet the energy requirements of the nation, the power generation through renewable energy technologies should be:
 - (a) Increased from 80,000 MW to 400,000 MW.
 - (b) Covering the remaining balance of 51,000 MW generated through various modes.
 - (c) Accelerated through integrated gasification and combined cycle route.
 - (d) Increased by 23 percent from the present 5 percent.
- 7. Which word in the passage is the antonym of "rare"?
 - (a) Existing

- (b) Numerous
- (c) Significant
- (d) Additional

8. Which of the following factor(s) are a reason behind the constrained utilization of coal as a fuel for generating energy?

- A. Low thermal efficiency of our power plants.
- B. Regional locations.
- C. Lack of integrated gasification.
- D. High ash content.
- E. Environmental concerns.

Choose the CORRECT answer from the options given below:

- (a) A, B, C only
- (b) B, C, D only
- (c) B, D, E only
- (d) B, D, A only

9. Given below are two statements that are based on the passage mentioned above:

Statement A: To meet the expected energy requirements in 2030, the power generation through renewable energy technologies has to be increased by percent.

Statement B: The balance 51,000 MW will be generated through conventional thermal plants.

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

- (a) Both Statement A and Statement B are correct.
- (b) Both Statement A and Statement B are incorrect.
- (c) Statement A is correct but Statement B is incorrect.
- (d) Statement A is incorrect but Statement B is correct.

10. Match List I with List II on the basis of the passage mentioned above:

	List i (power)		List ii (energy source)
A	50.000 MW	i	Wind energy
B	55,000 MW	ii	Thermal energy
C	51.000 MW	iii	Hydel energy
D	64000 MW	iv	Solar energy

Choose the CORRECT options given below:

- (a) A-i, B-iii, C-iv, D-ii
- (b) A-ii, B-iii, C-iv, D-i
- (c) A-iii, B-ii, C-iv, D-i
- (d) A-iii, B-iv, C-ii, D-i

11. If it was Saturday 17th December, 2002, what was the day on 26th December 2004?

- (a) Monday
- (b) Sunday
- (c) Tuesday
- (d) Thursday

12. Study the given pattern and select the number that can replace question mark in the given matrix:

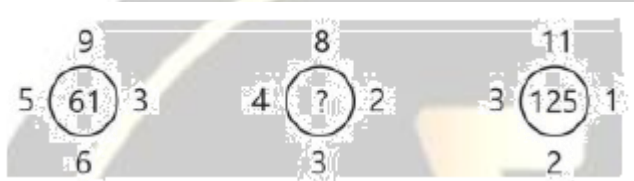
11	103	9
13	157	6
15	?	7

- (a) 175
- (b) 196
- (c) 211
- (d) 225

13. If in a certain code language 'FRIEND' is written as 'JPMCRB', 'UNCLE' is written as YLGJI% then what will be the code for 'LEADER'?

- (a) QCDBIP
- (b) PDFBDL
- (c) PCEBIP
- (d) RBFCNR

14. Find the missing number from the given alternatives:



- (a) 41
- (b) 56
- (c) 67
- (d) 79

15. If, $P \times Q$ means P is the husband of Q:

$P + Q$ means P is the father of Q.

$P - Q$ means P is the mother of Q.

$P \div Q$ means P is the sister of Q,

Then, which of the following relations shows that C is the paternal grandfather of D?

- (a) $C \times B - E \div D + A$
- (b) $C + A \times B \div E \div D$
- (c) $C + B \times A - E \div D$
- (d) $C \times B \div E + A - D$

16. In this question a number series is given. Choose the CORRECT alternative that will continue the same pattern and replace the question mark in the given series. 856, 849, 824 763, ?, 431:

- (a) 681
- (b) 642
- (c) 535
- (d) 495

17. Sunita starts from her home towards North. After walking 15 meters, she turned to her right and walked 55 meters. Then she turned to her left and after walking a distance of 20 meters turned to her left again and walked 67 meters. What is the shortest distance between her home and final position and what is the direction of final position with respect to her home?

- (a) 26 m, North-West.
- (b) 35 m, North-East.
- (c) 37 m, North-West.
- (d) 49 m, North-East.

18. Seven friends A, B, C, D, E, F and G are sitting on a straight bench all facing north. There are exactly three friends sitting between A and B. D is sitting to the left of B. Only one friend is sitting to the left of A. B is sitting immediately left of F. Only one friend is sitting between D and A Who is sitting at the extreme right end?

- (a) E
- (b) F
- (c) C
- (d) D

19. Select the option that is related to the third term in the same way as the second term is related to the first term and the sixth term is related to the fifth term. BSNT: Y X G C : : M X R V : ? : : F P C Y : C U V H :

- (a) JDKE
- (b) JCKD
- (c) JCKE
- (d) JCLE

20. A cube is painted black on two adjacent faces and on one apposite face, yellow on two apposite faces and green on the remaining face. It is then cut into 64 equal cubes. How many cubes have one black coloured face only?

- (a) 12
- (b) 24
- (c) 16
- (d) 8

21. In the given question, two statements are given followed by two conclusions numbered A and B. You have to take the given statements to be TRUE even if seem to be at variance from the commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding Commonly known facts:

Statements: All Hammers are pliers. All screws are pliers.

Conclusions A: Some hammers are screws.

B: Some screws are hammers is a possibility.

- (a) Both Conclusions A and B follow.
- (b) Both Conclusions A and B do not follow.
- (c) Conclusion A follows but conclusion B does not follow.
- (d) Conclusion A does not follow but conclusion B follows.

22. In this question there is a statement followed by two assumptions numbered A and B. You have to consider the statement and the following assumptions and decide which of the assumption(s) is/are implicit in the statement:

Statement: Rohan always studies from the reference books of publication X for his competitive exams.

Assumptions A: many of the questions asked in competitive exams are from the reference books of publication X.

B: Studying from reference books are necessary for competitive exams.

- (a) Only Assumption A is implicit.
- (b) Only Assumption B is implicit.
- (c) Neither assumption A nor B is implicit.
- (d) Both assumptions A and B are implicit.

23. Following table provides the marks obtained by four friends in five different subjects. Maximum marks in each subject are 100:

Friends	Physics	Chemistry	Mathematics	English	Physical Education
Rahul	89	92	79	81	90
Vinay	75	96	85	86	92
Abeer	94	90	89	77	90
Sudesh	93	91	84	86	92

Who has scored exactly 88% marks in total?

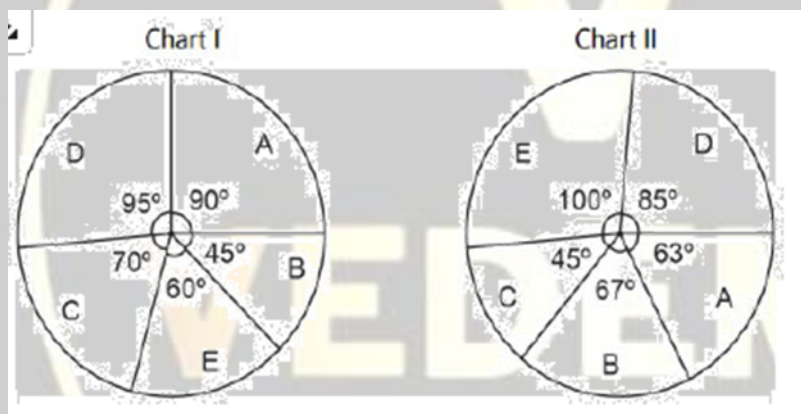
- (a) Rahul
- (b) Vinay
- (c) Abeer
- (d) Sudesh

24. In this question there is a statement, followed by two courses of action numbered A and B. You have to assume everything in the statement to be TRUE and on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s) for pursuing. Statement: A large number of people got ill due to eating cut fruits from road side shops. Courses of Action A. Municipal corporation should penalize the road side vendors if they sell cut fruits.

B. People should be made aware about the dangers of eating cut fruits sold in open.

- (a) Only A follows.
- (b) Only B follows.
- (c) Neither A nor B follows.
- (d) Both A and B follow.

25. The following pie chart show the distribution of students appearing in the Board examination (Chart I) and the students who have passed the Board examination (Chart II) from the different schools A, B, C, D and E:

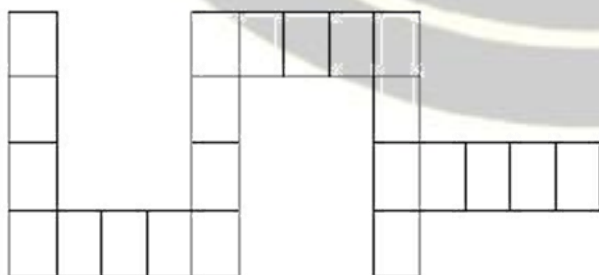


Total number of students appeared = 1800

Which school has the lowest percentage of students passed with respect to those appeared?

- (a) A
- (b) B
- (c) C
- (d) D

26. How many rectangles are there in the given figure?



- (a) 65
- (b) 70
- (c) 75
- (d) 80



Team of IITians & Doctors



Mr. Virendra
Ph. D, IIT BHU
All Subject Faculty



Dr Ravina
Ph. D (Neuroscience)
Biology Faculty



Dr Manisha
Ph. D, IIT BHU
Biology Faculty



Mr Ajay
MBA, IIM(Amritsar)
Maths & Aptitude Faculty



Jyoti Kumari
M.Sc
Biology Faculty



Saunak Sinha
M.Sc
Biology Faculty



Dr Sanjay
Post Doc, Ph. D, BHU
Biology Faculty



Dr Sudhakar
Ph. D, AU
Chemistry Faculty



Mr. Praveen
(B.Tech)
Physics Faculty



Mr. Anupam
(B.Tech)
Maths Faculty

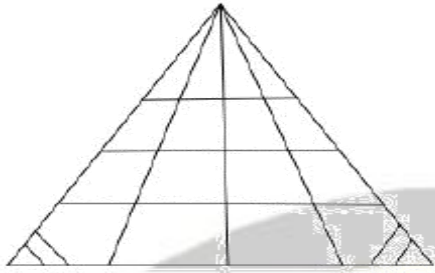


Tanya
(B.Tech)
English Faculty



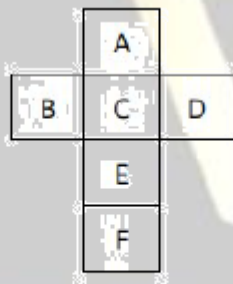
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27. How many triangles are there in the given figure?



- (a) 26
- (b) 34
- (c) 44
- (d) 46

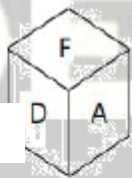
28. Select the box that **CANNOT** be formed by folding the given unfolded box:



(A)



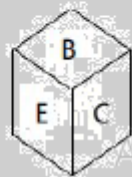
(B)



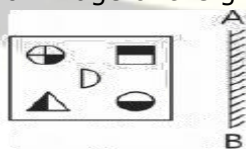
(C)



(D)



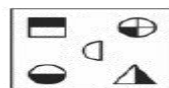
29. Choose the CORRECT mirror image of the given figure when the mirror is placed at line AB:



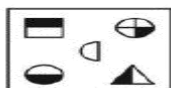
(A)



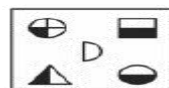
(B)



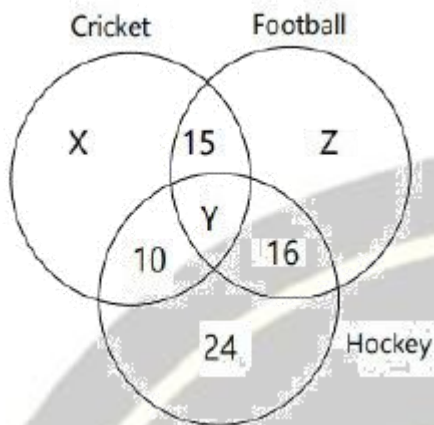
(C)



(D)

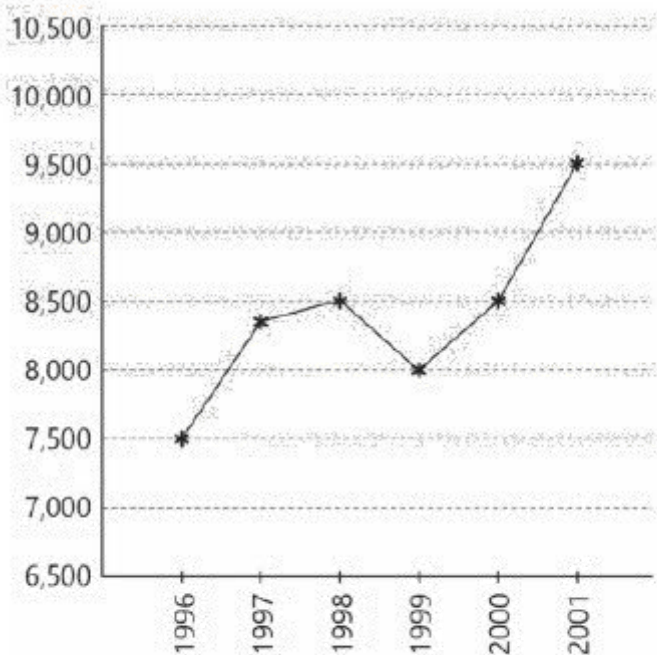


30. Study the Venn diagram and answer the question. The alphabets and numbers in different sections indicate the number of persons who play different games in a school:



If the total number of persons who play games in the school is 108 and the number of persons who play at least two games is 54. find the number of persons who play all the three games?

- (a) 11
(b) 13
(c) 19
(d) 21
31. If 'AMAN' is written as 'CLCM' in a certain code then in the same code 'ARUN' is written as:
(a) CQWO
(b) CQVM
(c) CPWM
(d) CQWM
32. Direction: Refer the chart below and answer the question. What is annual average rate of increase in the ice-cream market from 1996 to 2001?

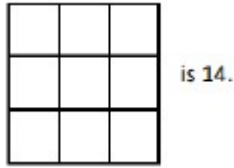


(ice-cream market in India) Activate W

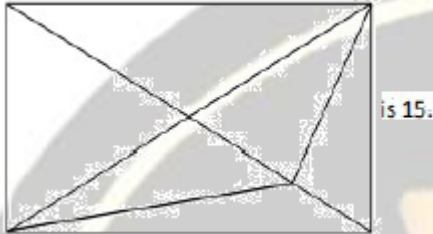
- (a) 5.33%
(b) 26.67%

- (c) 6.67%
(d) 10%

33. Statement A: The number of squares in the figure:



Statement B: The number of triangles in the figure.



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

- (a) Both Statement A and Statement B are true.
(b) Both Statement A and Statement B are false.
(c) Statement A is true but statement B is false.
(d) Statement A is false but statement B is true.

34. Statement A: The mirror-image of UTZFY6KH is HXØYJSTU.

Statement B: The water-image of D6Z7F4 is DQΣJL4.

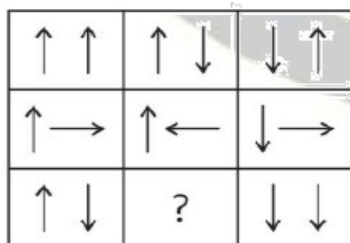
In the light of above statements, choose the CORRECT answer from the options given below:

- (a) Both Statement A and Statement B are true.
(b) Both Statement A and Statement B are false.
(c) Statement A is true but statement B is false.
(d) Statement A is false but statement B is true.

35. If '—' means '÷' means '+' means '×', '÷' means '—', 'x' means '+' then which of the following equations is CORRECT?

- (a) $52 \div 4 + 5 \times 8 - 2 = 36$
(b) $43 \times 7 \div 5 + 4 - 8 = 25$
(c) $36 \times 4 - 12 + 5 \div 3 = 420$
(d) $36 - 12 \times 6 \div 3 + 4 = 60$

36. Complete the figure matrix:



- (A) (B)
(C) (D)



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37. A cube whose two adjacent faces are coloured is cut into 64 identical small cubes. How many of these small cubes are **NOT** coloured at all?

(a) 60
(b) 48
(c) 36
(d) 32

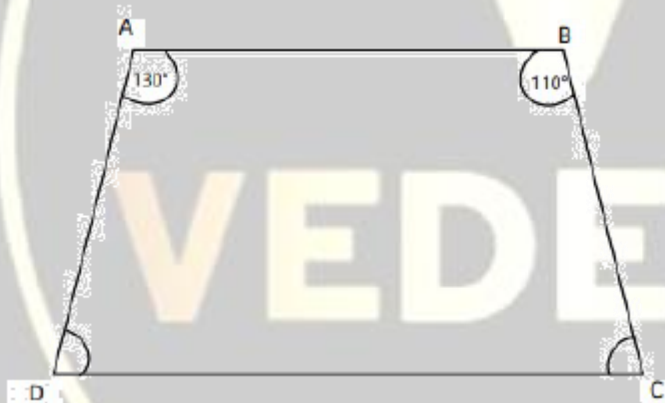
38. A dealer marks his goods at 20% above the cost price and allows a discount of 16% on the marked price. What is his gain percentage?

(a) 1%
(b) 2%
(c) 0.8%
(d) 0.08%

39. If $2a = 3b = 4c = 6d$, then value of $\frac{a^2+b^2}{c^2+d^2}$, is:

(a) $\frac{2}{3}$
(b) 4
(c) $\frac{1}{6}$
(d) $\frac{7}{3}$

40. In trapezium ABCD, in which $AB \parallel DC$:



$\angle A = 130^\circ$ and $\angle B = 110^\circ$ What is the value of $\angle C - \angle D$?

- (a) 10°
(b) 20°
(c) -20°
(d) 40°

41. In a town, 65% people watched the news on television. 40% read a newspaper and 25% read a newspaper and watched the news on television also. What percent of the people neither watched the news on television nor read a newspaper?

(a) 10
(b) 14
(c) 16
(d) 20

42.

- A. The missing term of the series.
4, 8, 28, 80, 244, ?, is 728.
- B. The missing term of the alphabet series.
UPI, SHJ, ODP, MBQ ? is IAV.

C. The missing term of the letter — number series.

Q1F, S2E U6D, W21C, ? is Y88B.

D. The missing term of the letter — number series.

D-4, F-6, H-8, J-10, ? is L-22

Choose the CORRECT answer from the options given below:

(a) A and C only.

(b) A, B and C only.

(c) B, C and D only.

(d) B and D only.

43. The ratio of the ages of man and his wife is 4 : 3, After 4 years, this ratio will be 9 : 7. If at the time of their marriage, the ratio of their ages was 5 : 3, then how many years ago were they married?

(a) 8

(b) 10

(c) 12

(d) 15

44. Read the following information and answer the question:

Alka is older than Mala. Gopal is older than Mala but younger than Alka. Kapil is younger than Ram and Mala. Mala is older than Ram.

A. Mala's age is between Gopal and Ram.

B. Gopal age is between Mala and Kapil.

C. Mala lies in the middle.

D. Alka is the youngest.

E. Kapil is the eldest.

Choose the CORRECT answer from the options given below:

(a) C and E only.

(b) B, D and E only.

(c) A, C and D only.

(d) A and C only.

45. Direction: Study the table carefully and answer the question:

Number of washing machines and refrigerators manufactured by a company.

	2005	2006	2007	2008	2009
Washing machine	14400	20500	12800	16400	18600
Refrigerator	12800	24700	19200	20200	14900

Find, what was the difference in the total number of washing machines and refrigerators manufactured in 2006 to the total number of washing machines and refrigerators manufactured in 2008?

(a) 6800

(b) 5600

(c) 8600

(d) 8200

46. Given below are two statements:

Statement A: A compound interest on a certain sum for 2 years at 10% per annum is 525. The simple interest on the same sum for double the time at half the rate percent per annum is 500.

Statement B: The respective ratio of milk and water in the mixture is 4 : 3. If 6 litres of water is added to this mixture, the respective ratio of milk and water becomes 8 : 7, then the quantity of milk in the original mixture is 24 litres.

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

(a) Both Statement A and Statement B are correct.

(b) Both Statement A and Statement B are incorrect.

- (c) Statement A is correct but statement B is incorrect.
(d) Statement A is incorrect but statement B is correct.

47. If $x + \frac{1}{x} = 10$, then what is the value of $(x^2 - \frac{1}{x^2})^2$:

- (a) 9,600
(b) 9,604
(c) 9,608
(d) 9,610

48. A sector of a circle of radius 6 cm is formed with central angle 60° . What will be its area (in cm^2)?
(Here ' π ' refers to $\frac{22}{7}$)

- (a) $\frac{3}{4}\pi$
(b) $\frac{5}{4}\pi$
(c) 6π
(d) 12π

49. How many four-digit numbers can be formed by using the digits 0, 1, 3, 7 if repetition of digits are allowed?

- (a) 160
(b) 500
(c) 2400
(d) 2500

50. What is the difference between simple interest and compound interest on sum 10,000 at the rate of 10% per annum for the period of two years?

- (a) 110
(b) 100
(c) 150
(d) 160

Section B Cross Disciplinary

51. A short microtubular organelle projecting into extra cellular medium used for locomotion:

- (a) Cisternae
(b) Cilium
(c) Pseudopodium
(d) Basal Body

52. Organelle that is involved in carbohydrate digestion, autophagy, hydrolysis etc:

- (a) Golgi body
(b) Nucleus
(c) Lysosome
(d) Mitochondria

53. Microtubular protein having ATPase activity and required for movement:

- (a) Ecdysone
(b) Fibronectin
(c) Dynein
(d) Sarcopin

54. Which of the following principle of bioethics emphasizes the importance of minimizing harm and maximizing benefits in health care decisions?

- (a) Justice
- (b) Autonomy
- (c) Beneficence
- (d) Non-maleficence

55. Which of the following ethical principle supports the idea that health care resources should be distributed fairly among individuals and communities?

- (a) Confidentiality
- (b) Informed consent
- (c) Justice
- (d) Beneficence

56. Match List I with List II.

	List I		List II
A	Released by anterior pituitary and affects the adrenal gland.	i	FSH
B	Influences extracellular fluid volume.	ii	Oxytocin
C	Stimulates estrogen secretion and egg maturation in females.	iii	ADH
D	Causes uterine contractions during child birth.	iv	ACTH

Choose the CORRECT options given below:

- (a) A-ii, B-iv, C-iii, D-i
- (b) A-iv, B-i, C-ii, D-iii
- (c) A-iii, B-iv, C-ii, D-i
- (d) A-iv, B-iii, C-i, D-ii

57. Given below are two statements:

Statement A: An endocrine gland releases substance through tubes or ducts.

Statement B: An exocrine gland releases substance it makes directly into the fluid bathing the glands.

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

- (a) Both Statement A and Statement B are true.
- (b) Both Statement A and Statement B are false.
- (c) Statement A is true but statement B is false.
- (d) Statement A is false but statement B is true.

58. Match List I with List II.

	List I		List II
A	Mechanoreceptor	i	Detects Change in water volume of a solution.
B	Nociceptor	ii	Responds to heat or cold.
C	Osmoreceptor	iii	Detects tissue damage.
D	Thermoreceptor	iv	Detects changes in pressure position or acceleration.

Choose the CORRECT answer from the options given below:

- (a) A-iv, B-i, C-ii, D-iii
- (b) A-iii, B-iv, C-ii, D-i
- (c) A-ii, B-i, C-iv, D-iii
- (d) A-iv, B-iii, C-i, D-ii

59. Which of the following connective tissues has a matrix of collagen and elastin fibres in a rubbery ground substance?

- (a) Adipose
- (b) Bone

- (c) Cartilage
- (d) Blood

60. All of the following acts as anaphylotoxins **EXCEPT**:

- (a) C3a
- (b) C4a
- (c) C5a
- (d) C6a

61. The mechanism by which B cells ensure that only one heavy and one light chain allele is translated is referred to as:

- (a) Co-dominance
- (b) Allelic exclusion
- (c) Isotypic selection
- (d) Idiotypic selection

62. Given below are two statements regarding Major Histocompatibility Complex (MHC).

Statement A: MHC I contain two different polypeptide chains — α chain and β chain.

Statement B: MHC I is present on all nucleated cells.

In the light of the above two statements, select the most appropriate answer from the options given below:

- (a) Both Statement A and Statement B are correct.
- (b) Statement A is correct but Statement B is incorrect.
- (c) Statement A is not correct but Statement B is correct.
- (d) Both Statement A and Statement B are not correct.

63. The function of the 3' to 5' exonuclease activity of a DNA polymerase is to:

- (a) Remove the 5' end of the polynucleotide strand that is attached to the template strand that is being copied.
- (b) Remove incorrect nucleotides from the newly synthesized strand of DNA.
- (c) Remove damaged nucleotide from the template strand during DNA synthesis.
- (d) Remove nucleotides from the ends of DNA molecules to ensure the generation of blunt ends.

64. Identify which of the following tests is the most convincing to identify a gene as oncogene or tumor suppressor gene:

- (a) Transgenic mice overexpressing the candidate oncogene and knock-out mice lacking the candidate tumor suppressor gene.
- (b) Transgenic mice overexpressing the candidate tumor suppressor gene and knock-out mice lacking the candidate oncogene.
- (c) Transgenic mice that overexpresses the candidate oncogene and tumor suppressor gene.
- (d) Knockout mice that lacks the candidate oncogene and tumor suppressor Gene.

65. A study is done on a mammalian cell line that has a doubling time of 24 hours. These cells are synchronized in G1 and then labeled for 2 days with BrdU (an analog of thymidine). At the end of labeling period, chromosomal DNA is isolated from the cells and its density analyzed by equilibrium centrifugation in cesium chloride gradients. Which of the following patterns would be expected to be seen? (H = heavy, L = light):

- (a) 100% H/H
- (b) 100% H/L
- (c) 50% H/H, 50% H/L
- (d) 50% H/H 50% L/L

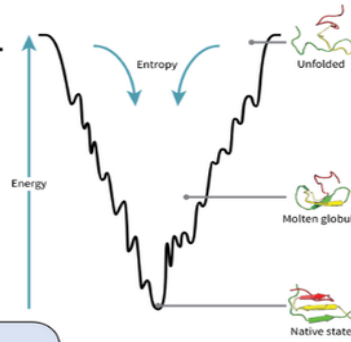
VEDEMY'S CAPSULE (VEDEMY'S SPECIAL NOTES)

Amino acid Classes

Essential
Semi-essential
Non-Polar
Polar Uncharged
Negative charged
Positive charged
Gluco-ketogenic
Ketogenic

My Very Talented Friend Is Waiting For KajoL
RahuL
GAV के लोग PILW लेकर FM सुन रहे थे
CN(कार्टून नेटवर्क) पे STY(सत्य) Ques पूछते हैं
Ye DEKh
RaHuL bola
Itni Talented WYF (wife)
KajoL

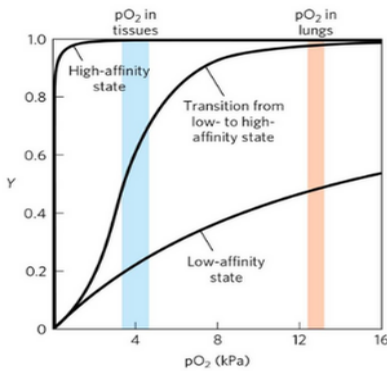
Protein Folding Curve



Energy profile-
High
U- Unstructured
M- molten globule
D- discrete structure
N- native
A- amorphous
A- amyloid
Low
Urmila
Matoldkar ka
DNA
Achha hai

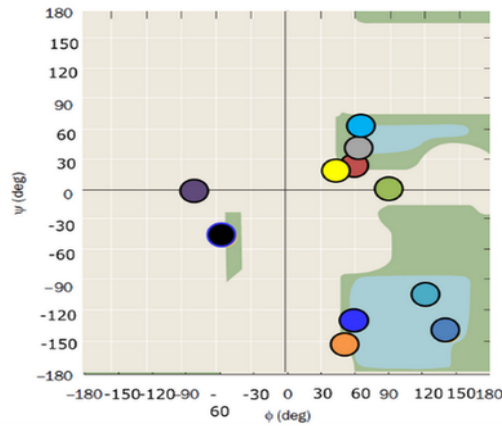
Hemoglobin

State of Hb - **MOLD**
Oxy Hb
Less acidic (Tensed state)
Deoxy Hb
More acidic (Relaxed state)



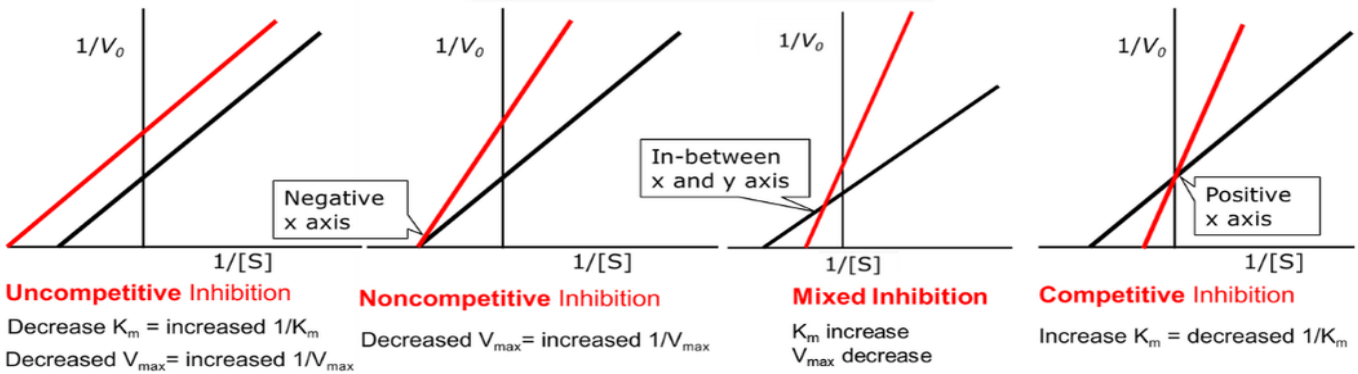
H+, Temp. BPG, CO₂ Increase
Affinity of Curve - **DRIL**
Decrease
Left shift
Right shift

Ramachandran plot



Secondary Structure	Phi	Psi
AP β Sheet	+140°	-135°
P β Sheet	+120°	-115°
CTH	+50°	-150°
L-α-H	-60°	-50°
R-α-H	+60°	+50°
Type-I i+1	+60°	+30°
Type-I i+2	+90°	0°
Type-II i+1	+60°	-120°
Type-II i+2	-80°	0°

Enzyme Inhibition Curve



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Non-competitive
Mixed
MI ka PC lekar aaye
Positive x axis
Competitive

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66. Identify the CORRECT order in which extra-cellular signals are transmitted:

- A. Adenylate cyclase
- B. cAMP
- C. Protein kinase A

Choose the CORRECT answer from the options given below:

- (a) A, B and C
- (b) C, B and A
- (c) A, C and B
- (d) B, C and A

67. Which of the following is **NOT** a function of the lysosomes?

- (a) Engulf worn out components of the cells.
- (b) Engulf exogeneous substances.
- (c) Suicidal bags.
- (d) Power generating units.

68. Given below are two statements:

Statement A: In Anaphase I, homologous chromosomes separate which sister chromatids remain together.

Statement B: In Anaphase II, chromosomes line up along the metaphase plate.

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

- (a) Both Statement A and Statement B are correct.
- (b) Both Statement A and Statement B are incorrect.
- (c) Statement A is correct but Statement B is incorrect.
- (d) Statement A is incorrect but Statement B is correct.

69. The function of the hepatic portal circulation is to:

- (a) Carry toxins to the venous system for disposal through the urinary tract.
- (b) Hormone distribution.
- (c) Collect absorbed nutrients for metabolic processing or storage.
- (d) Transfer bile to the liver from the pancreas.

70. Which of the following statements is **INCORRECT**?

- (a) Aldosterone stimulates the reabsorption of Na^+ .
- (b) Aldosterone affects water resorption.
- (c) Aldosterone is made in the hypothalamus and released from the anterior pituitary.
- (d) Aldosterone stimulates the secretion of K^+ .

71. Regarding BLAST (Basic Local Alignment Search Tool) all the following statements are CORRECT **EXCEPT**:

- (a) The tool is used to compare newly sequenced genomic DNA to known sequences stored in various databases.
- (b) Once aligned the result is showed as Output Of three lines: Query, Subject (Subject) and human sequence.
- (c) Access to BLAST is provided by NCBI.
- (d) BLAST report also provides an 'Expect' value or E value based on number of Matches.

72. Given below are two statements; in which one is Assertion (A) and the other one is:

Reason (R):

Assertion (A): Cri du chat syndrome is a classical example of endopolyploidy in human.

Reasoning (R): In Cri du chat syndrome there is partial monosomy resulting from small terminal deletion involving chromosome 5.

In the light of above statements choose the CORRECT answer:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

73. Given below are two statements:

Statement A: The genetic code is written in linear form with three nucleotide letters thus referred as triplet code.

Statement B: The coding system is highly variable, in different organisms one triplet code can specify different amino acids in different organisms.

In the light of the above statements, choose the CORRECT answer from the options:

- (a) Both Statement A and Statement B are true.
- (b) Both Statement A and Statement B are false.
- (c) Statement A is true but statement B is false.
- (d) Statement A is false but statement B is true.

74. In a pedigree, the first person identified to be suffering from a genetic disease is called as:

- (a) Consultant
- (b) Proband
- (c) Kindred
- (d) Consultand

75. Two hypothetical SNPs (Single Nucleotide Polymorphism) in humans are 4 map units (m.u.) apart the allele at SNPI can be A or T; the allele at SNP2 can be C or G. A male with genotype AG/TC and a female with genotype AC/AC have a child. What is the probability they have a child with genotype AG/AC?

- (a) 96%
- (b) 4%
- (c) 48%
- (d) 16%

76. The clover leaf structure is a unique feature of which of the following molecules?

- (a) 28S subunit of ribosome.
- (b) Unspliced mRNA molecule.
- (c) Spliced tRNA molecule.
- (d) Pre-processed sno RNA.

77. An autosomal recessive condition affects 1 new born in 10,000. What is the expected frequency of carriers?

- (a) 198/10,000
- (b) 99/10,000
- (c) 1/100
- (d) 99/100

78. The Hardy Weinberg principle is integral to population genetics. All of the following options can disturb the Hardy Weinberg equilibrium **EXCEPT**:

- (a) Random mating
- (b) Mutation
- (c) Gene Flow
- (d) Small population Size

79. In genetic linkage, the concept of recombination fraction is very important, of the characteristics given here, choose the CORRECT ones:

- A. Recombination fraction is usually designated as θ (theta).

- B. It is the measure of the distance separating two loci on different chromosomes.
- C. It gives an indication of the likelihood that a cross-over will occur between the two loci.
- D. Genes at loci are not linked then $\theta = 0.5$.
- E. Genes at unlinked loci will segregate together during 20% of all meiosis.
- (a) B, C and E
- (b) A, D and E
- (c) A, C and D
- (d) A, B and C

80. The process of genetic counselling involves various steps. These steps have been randomised and listed below. From the options given below, choose the CORRECT sequence in which the counselling steps should be undertaken/performed:

- A. Risk assessment.
- B. Diagnosis based on history and investigation.
- C. Long term contact and support group.
- D. Discussion of options.
- (a) B, D, C, A
- (b) B, A, D, C
- (c) A, B, C, D
- (d) B, C, A, D

81. In which stage of the cell cycle, the cells double their amount of DNA?

- (a) G1 phase
- (b) G2 phase
- (c) M phase
- (d) S phase

82. In Eukaryotes, citric acid cycle takes place in:

- (a) Nucleus
- (b) Cytoplasm
- (c) Mitochondria
- (d) Golgi bodies

83. What is the approximate molecular mass of polypeptide containing 100 amino acid residues?

- (a) 300 Da
- (b) 1 1,000 Da
- (c) 30000 Da
- (d) 110 Da

84. Human genomic DNA isolated with concentration of $400 \mu\text{g/ml}$, needs to be digested with restriction enzyme Bam H1 (2000 U/ml). Investigator needs to set reaction with 10 ug of genomic DNA with 10 units of enzyme. How much volume (in μl - micro litre) needs to be drawn from the two stock solutions respectively to get 10 ug of DNA and 10 U of enzyme?

- (a) DNA stock - $25 \mu\text{l}$ Enzyme — $5 \mu\text{l}$.
- (b) DNA stock - $35 \mu\text{l}$ Enzyme- $7.5 \mu\text{l}$.
- (c) DNA stock — $27.5 \mu\text{l}$ Enzyme — $7.5 \mu\text{l}$.
- (d) DNA stock — $10 \mu\text{l}$ Enzyme - $10 \mu\text{l}$.

85. Match the List I with List II.

	List I		List II
A	Taq DNA polymerase	i	Used to make cDNA.
B	MMLV Reverse Transcriptase	ii	Used to phosphorylate oligos or DNA.
C	RNA polymerase II	iii	Used to amplify DNA.

D	T ₄ poly nucleotide kinase	iv	Transcription particularly of mRNA Ln (RNA.
---	---------------------------------------	----	---

Choose the CORRECT options given below:

- (a) A-iv, B-iii, C-ii, D-i
- (b) A-iii, B-iv, C-i, D-ii
- (c) A-i, B-ii, C-iii, D-iv
- (d) A-iii, B-i, C-iv, D-ii

86. Select the CORRECT primer pair of forward and reverse primer sequence that amplify full length of sequence given below:

5' - TAC TAT CGA GTA CTA GAC TAC TAAGT 1 - 100 - 1 ACT, AGA CGT ACG, TAG, TAC, GTT ACT AC - 3'

- (a) 5' - ATG ATA GCT CAT GAT CTG AT - 3' Forward.
5' - GTA GTA ACG TAC TAC GTA CG - 3' Reverse.
- (b) 5' - TAC TAT CGA GTA CTA GAC TA- 3' Forward.
5' - GTA GTA ACG TAC TAC GTA CG- 3' Reverse.
- (c) 5' - ATG ATA GCT CAT GAT CTG AT- 3' Forward.
5' - GCA TGC ATC ATG CAA TGA TG- 3' Reverse.
- (d) 5' -TAG TCT AGT ACT CGA TAG TA - 3' Forward.
5' - GCA TGC ATC ATG CAA TGA TG- 3' Reverse.

87. _____ variant of BLAST, compares a DNA query sequence to the protein database:

- (a) BLASTP
- (b) BLASTX
- (c) BLAST N
- (d) TBLASTN

88. Which one of the following is **NOT** a primary database?

- (a) SWISS – PROT
- (b) EMBL
- (c) DDBJ
- (d) Gen Bank

89. The computational approaches to predict the three-dimensional structures of proteins are:

- A. Homology modeling
- B. X-ray crystallography
- C. NMR
- D. Threading
- E. Ab-initio

Choose the CORRECT answer from the options given below:

- (a) A only
- (b) B and C only
- (c) A, D and E only
- (d) C only

90. What happens to transferrin when iron is bound to it and it interacts with its receptor?

- (a) It is degraded inside the lysosome.
- (b) Undergoes a conformational change allowing binding to its receptor.
- (c) It is converted to apotransferrin.
- (d) Permanently internalized and degraded.

91. Which non-viral gene delivery method utilizes physical forces to introduce genetic material into cells?

- (a) Liposomes
- (b) Poly (L-lysine)

- (c) Electroporation
- (d) Adenoviruses

92. Which protein is responsible for cleaving double stranded RNA into smaller fragments during RNA interference?

- (a) Slicer
- (b) Helicase
- (c) RISC
- (d) Dicer

93. What is the main advantage of using Short Tandem Repeats (STRs) over restriction fragment length polymorphism (RFLP) in DNA fingerprinting?

- (a) STRs are easier to visualize on a gel.
- (b) STRs requires less DNA and are more resistant to degradation.
- (c) STRs produce more distinct band pattern.
- (d) STRs are less expensive to analyze.

94. Which of the following steps in PCR is responsible for separating double-stranded DNA into single strands?

- (a) Annealing
- (b) Extension
- (c) Melting
- (d) Elongation

95. Match the following

	List I		List II
A	Autotroph	i	Macro consumers
B	Phagotrops	ii	Micro consumers
C	Saprotrops	iii	Primary producers
D	Heliotrophs	iv	Sun loving plants

Choose the CORRECT answer from the options given below:

- (a) A-ii, B-iv, C-iii, D-i
- (b) A-i, B-ii, C-iii, D-iv
- (c) A-iii, B-i, C-ii, D-iv
- (d) A-i, B-iii, C-iv, D-ii

96. The reductive pentose phosphate pathway is also known as:

- A. Photosynthetic Carbon Oxidation cycle (PCO)
- B. Calvin - Benson cycle
- C. Photorespiration
- D. C₄ cycle

Choose the CORRECT answer from the options given below:

- (a) Both A and B are correct
- (b) Both B and C are correct
- (c) B only
- (d) C only

97. Cortisones, used in the treatment of rheumatoid arthritis, are produced from fermentation of _____ by *Rhizopus migracans*:

- (a) Amino acids
- (b) Lipids
- (c) Glycosides
- (d) Starch

98. In cell cycle there are 4 stages. M, G₁, S and G₂. There is another term commonly used; G₀ phase. Choose the best described statement for this G₀ phase:
- Cells are at growing stage.
 - Cells are at the stage of differentiation.
 - Cells have ceased to divide.
 - Cells are about to double.
99. Based on series of events outlined in Central Dogma, there are enzymes that convert from one Stage to the other, However, one conversion is **NOT** possible yet. Identify the stage:
- DNA to RNA
 - Protein to RNA
 - DNA to DNA
 - RNA to DNA
100. In lactose operon, the following events happen:
- The operon is normally in an "off mode when appropriate substrate is absent.
 - Lactose is an inducer substrate.
 - If lactose is added to the cells environment it triggers events that turn the operator "on".
 - The structural genes are transcribed in 3 different transcripts coding for all three different enzymes.
 - As lactose is depleted, operon is repressed.
- Which of the answer is CORRECT?
- A, B and C
 - B, C and D
 - A, D and E
 - C, D and E

Section C Biological Sciences

101. Choose the CORRECT definitions:
- Emigration: It is the addition of new individuals to the population from other localities.
 - Immigration: It is the number of individuals going out from a population to join another population in a new locality.
 - Density dependent factors: Population increase cause scarcity of food, leading to death due to starvation.
 - Density independent factors: Interaction between populations in a given area can lead to mutual benefits.
- Choose the CORRECT answer from the options given below:
- A, B only
 - B, C only
 - C, D only
 - D, A only
102. Choose the CORRECT definitions:
- 'Population density' is population size in relation to some unit of space and time.
 - 'Natality' is usually described in terms of the birth rate.
 - 'Mortality' rate refers to the deaths occurred due to diseases.
 - 'Sex ratio' refers to the number of 'females' relative to the number of 'males'.
 - in the population.
- Choose the CORRECT answer from the options given below:
- A and C
 - A and B
 - B and C

(d) A and D

103. Examples of non-renewable resources are:

- A. Coal
- B. Mineral oil
- C. Water used in industry
- D. Water used in domestic

Choose the CORRECT answer:

- (a) A, B only true.
- (b) A, C only true.
- (c) A, D only true.
- (d) C, D only true.

104. Factors that affect populations of a country are:

- A. Birth rate
- B. Death rate
- C. Emigration
- D. Immigration

Choose the CORRECT answer:

- (a) A only true.
- (b) A, B only true.
- (c) B, C only true.
- (d) A, B, C, D only true.

105. In Mesosphere, temperature_____:

- (a) Increases with height.
- (b) Decreases with height.
- (c) Constant With height.
- (d) Variable.

106. Which element present in highest amount in the earth crust?

- (a) Sodium
- (b) Chlorine
- (c) Magnesium
- (d) Carbon

107. Laws governing Biodiversity Conservation in India:

- A. All India Elephant Preservation Act — 1879.
- B. The Indian Forest Act — 1972.
- C. The Indian Fisheries Act — 1897.
- D. The Wild Life (Protection) Act — 1927.

Choose the CORRECT answer from the options given below:

- (a) A, B only true.
- (b) A, C only true.
- (c) B, C only true.
- (d) C, D only true.

108. Wild life protected areas in different states are given below:

A	Tamil Nadu	Mudumalai
B	Gujarat	Gir

C	Kerala	Periyar
D	Sikkim	Sunderban

Choose the CORRECT answer:

- (a) A only true.
- (b) A, B only true.
- (c) A, B, C only true.
- (d) A, C, D only true.

109. Given below are two statements:

Statement A: The main sources of acid rains are oxides of Sulphur and nitrogen.

Statement B: Acid rain is responsible for stone leprosy.

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

- (a) Both Statement A and Statement B are true.
- (b) Both Statement A and Statement B are false.
- (c) Statement A is true but Statement B is false.
- (d) Statement A is false but Statement B is true.

110. Given below are two statements:

Statement A: Carbon dioxide, together with water vapor, is responsible for maintaining the earth's atmosphere at a level that support life.

Statement B: About half of the total solar energy that strikes the earth is absorbed by the earth.

In the light of the above statements choose the most appropriate answer from the options:

- (a) Both Statement A and Statement B are true.
- (b) Both Statement A and Statement B are false.
- (c) Statement A is true but Statement B is false.
- (d) Statement A is false but Statement B is true.

111. Match the following:

	Fungus		Human disease
A	Mucor pusillus	i	Candidiasis
B	Candida albicans	ii	Cryptococcosis
C	Lipomyces neoformans	iii	Neuritis
D	Cladosporium corrionii	iv	Chromomycosis

Choose the CORRECT answer from the options given below:

- (a) A-ii, B-iv, C-i, D-iii
- (b) A-iii, B-i, C-iv, D-ii
- (c) A-iii, B-i, C-ii, D-iv
- (d) A-i, B-ii, C-iii, D-iv

112. Biophotolysis in oscillatoria is mediated by:

- (a) Nitrogenase
- (b) Denitrogenase
- (c) Hydrogenase
- (d) Lypase

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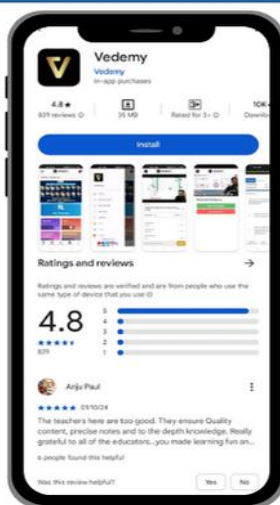
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113. Tobacco mosaic virus was discovered by:

- (a) Lwanowski
- (b) Stanley
- (c) Bawden
- (d) Twort

114. Prions the small proteinaceous infectious particles were named by:

- (a) Prusiner
- (b) Diener
- (c) Lwanowski
- (d) Baldwin

115. Rubisco gets activated by light due to:

- A. Increase in pH of lumen.
- B. Decrease in pH of lumen.
- C. Decrease in pH of stroma.
- D. Increase in pH of stroma.

Choose the CORRECT answer from the options given below:

- (a) A and B only.
- (b) A and C only.
- (c) B and C only.
- (d) B and D only.

116. The entire process of electrons being displaced from PSI due to excitation by light. getting replaced from photosystem II and PS II obtaining the electrons from water is called:

- (a) Cyclic electron flow.
- (b) Cyclic phosphorylation.
- (c) Non-cyclic phosphorylation.
- (d) Non-cyclic electron flow.

117. In allosteric regulation:

- (a) The modulators act by inducing change in conformation of the enzyme upon binding to a site other than the active site by non-covalent bonds.
- (b) The modulators act by inducing change in conformation of the enzyme upon binding to an active site by non-covalent bonds.
- (c) The modulators act by inducing change in conformation of the enzyme upon binding to an active site by covalent bonds.
- (d) The modulators act by inducing change in conformation of the enzyme upon binding to a site other than the active site by a covalent bond.

118. The active site of an enzyme is flexible as per the:

- (a) Competitive inhibition model.
- (b) Induced fit model.
- (c) Lock and key model.
- (d) Transition state model.

119. Free energy is:

- (a) Potential energy of a molecule determined by its chemical structure.
- (b) Energy isothermally available to do work.
- (c) Potential energy available to do work.
- (d) Standard free energy.

120. The difference between inside and outside hydrostatic pressure across the plasma membrane and cell wall is known as:
- (a) Gravitational potential
 - (b) Turgor pressure
 - (c) Matric potential
 - (d) Wall pressure
121. Given below are two statements. One is labelled as Assertion (A) and the other is: labelled as Reason R.
Assertion A: Some infection promote the development of autoimmune diseases.
Reason R: Infectious microbes may contain antigens that cross-react with self-antigens.
In the 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.
 - (d) A is not correct but R is correct.
122. The following steps are involved in characterization of antigens by Western Blotting:
- A. Electrophoretic transfer of proteins to membrane.
 - B. Separate protein antigen by SDS-poly acrylamide gel electrophoresis.
 - C. Denature proteins in the presence of SDS and apply to gel.
 - D. Label proteins in the membrane using a primary antibody specific for the antigen of interest.
 - E. Use antibody — labelled membrane with a substrate.
- Choose the CORRECT answer from the options given below:
- (a) A, B, C, D, E
 - (b) E, C, B, A, D
 - (c) C, B, A, D, E
 - (d) B, A, C, E, D
123. The following steps are involved in the generation of antibodies specific for the T-cell receptor:
- A. Induce fusion of antigen specific T cells with long-lived T-cell line.
 - B. Immunize mouse with the antigen, isolate the lymph nodes and culture with the antigen.
 - C. Grow up individual clones of T-cell hybridomas that secrete IL-2 when stimulated with antigen specific peptides.
 - D. Production of antibodies that bind T-cell receptor on the T-cell hybridoma.
 - E. Identification of monoclonal antibody that interferes with the antigen recognition by T-cell hybridoma.
- Choose the CORRECT answer from the options given below:
- (a) A, B, C, D, E
 - (b) B, A, C, D, E
 - (c) C, B, A, E, D
 - (d) B, A, C, E, D
124. Given below are two statements regarding vaccines:
- Statement A: Vaccines are effective because of adaptive immunity and immune memory.
- Statement B: Antibody memory exists in two compartments; first as pre-existing antibody and and second as memory B-cells.
- In the light of the above statements, choose the most appropriate answer from the options:
- (a) Both Statement A and Statement B are true.
 - (b) Both Statement A and Statement B are false.
 - (c) Statement A is true but Statement B is false.
 - (d) Statement A is false but Statement B is true.

125. Given below are two statements regarding the generation of a vast array of B-cell Receptors:
 Statement A: Multiple gene segments encode the light chain.
 Statement B: DNA recombination occurs in immunoglobulin genes in somatic cells.
 In the light of the above statements, choose the CORRECT answer from the options given below:
 (a) Both Statement A and Statement B are true.
 (b) Both Statement A and Statement B are false.
 (c) Statement A is true but Statement B is false.
 (d) Statement A is false but Statement B is true.

126. Given below are two statements regarding ubiquitination. binding of the carboxy terminal of ubiquitin to lysine residues of target proteins:
 Statement A: Mono — or poly — ubiquitination serves as a mechanism by which the tagged proteins are targeted for destruction by the proteasome of the cell.
 Statement B: Ubiquitination can serve as an activating signal by which the tagged proteins may form an activating complex.
 In the light of the above statements, choose the CORRECT answer from the options given below:
 (a) Both Statement A and Statement B are true.
 (b) Both Statement A and Statement B are false.
 (c) Statement A is true but Statement B is false.
 (d) Statement A is false but Statement B is true.

127. The following belong to the methods to enumerate and study functional responses of T cells, Match List I with List II.

	List I		List II
A	In vitro proliferation of T- lymphocytes	i	ELISpot
B	In vivo proliferation of T-lymphocytes	ii	5, 6 — carboxyfluorescein diacetate succinimidyl ester (CFSE)
C	Enumerate T cells with a single antigen specificity	iii	Peptide — MHC tetramers
D	To quantify cytokine- secreting effector T cells	iv	³ H— labeled thymidine

Choose the CORRECT answer from the options given below:

- (a) A-i, B-ii, C-iii, D-iv
 (b) A-ii, B-iii, C-iv, D-i
 (c) A-iv, B-ii, C-iii, D-i
 (d) A-iv, B-iii, C-ii, D-i
128. Given below are two Statements regarding T-cell receptor (TCR) affinity and selection:
 Statement A: Fewer than 5% of thymocytes produce TCRs that bind to MHC-peptide complexes with high affinity. These will survive and mature.
 Statement B: More than 90% of thymocytes produce TCRs that either **DONOT** bind to MHC/peptide complexes or bind them with very low affinity. These die by neglect.
 In the light of the above statements, choose the most appropriate answer from the options given below:
 (a) Both Statement A and Statement B are true.
 (b) Both Statement A and Statement B are false.
 (c) Statement A is true but Statement B is false.
 (d) Statement A is false but Statement B is true.
129. Only three of the protein implicated in V(D)J recombination are unique to lymphocytes. One of the following protein participates in the V(D)J recombination of antibody genes and is unique to the lymphocytes. Identify:
 (a) Terminal deoxynucleotidyl Transferase (TdT)
 (b) Artemis

- (c) DNA ligase IV
- (d) HMC protein

130. Given below are two statements. One is labelled as Assertion (A) and the other is: labelled as Reason R:

Assertion A: Type B T-cells would sneak through the negative selection process in the thymus.

Reason R: Thymic medullary epithelial cells or dendritic cells are uniquely capable of forming MHC class II — Insulin peptide from exogenous sources.

In the light of the above statements. choose the most appropriate answer from the option 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.
- (d) A is not correct but R is correct.

131. Insects belong to:

- (a) Mollusca
- (b) Annelids
- (c) Amphibia
- (d) Arthropoda

132. Two hit origin of cancer i.e. both the alleles need to be inactivated for a gene to be inactive was first demonstrated/observed in:

- (a) Li Fraumeni syndrome
- (b) Retinoblastoma
- (c) Down syndrome
- (d) Von hippel lindau syndrome

133. Telomerase enzyme is activated only in:

- A. Stem cells
- B. Differentiated somatic cells
- C. Cancer cells
- D. Muscle cells

Choose the CORRECT answer from options:

- (a) B and C
- (b) D and B
- (c) A and D
- (d) A and C

134. In a Trisomic individual the number of chromosomes is:

- (a) $2n + 2$
- (b) $2n + 1$
- (c) $2n - 1$
- (d) $2n - 2$

135. Which of the following is an epigenetic factor that controls gene expression at DNA level in eukaryotes?

- (a) Recombination
- (b) Protein Acetylation
- (c) DNA methylation
- (d) Protein phosphorylation

136. What is the chemical modification of genome that is categorized as Imprinting process?

- (a) Phosphorylation of DNA.

- (b) Methylation of DNA.
- (c) Acetylation of DNA.
- (d) Glycosylation of DNA.

137. Human Telomeres have multiple repeats of following sequences:

- (a) TTAGGG
- (b) ATTGGG
- (c) TTTGGG
- (d) AATGGG

138. A man identified with nervous system disease syndrome caused by mutation in mitochondrial DNA. He married a female without any such abnormality and is healthy. What is the chance of offspring getting syndrome of father?

- (a) $\frac{1}{2}$
- (b) 0
- (c) $\frac{1}{4}$
- (d) $\frac{3}{4}$

139. In mitochondrial mutation associated with disease, the following two crosses were made:

A. mutant ♀ x wildtype ♂ → progeny?

B. wildtype ♀ x mutant ♂ → progeny?

What are the progeny phenotypes in these matings?

- (a) A. All progeny is mutant and diseased phenotype.
B. All progeny is normal.
- (b) A. All is normal.
B. All is mutant and diseased phenotype.
- (c) A. All progeny is normal.
B. All progeny is carrier and normal.
- (d) A. All progeny is carrier and normal.
B. All progeny is mutant and diseased phenotype.

140. Mendel in his experiment did reciprocal crossing between two phenotypes — plants of purple flower with plant of white color. Reciprocal crossing produced in F₁ — All purple colors. By self-crossing the F₁, the P₂ generation produces more of purple coloured flowers and few of white coloured flowers. From observation what you infer:

- (a) All purple colour phenotype is dominant, white colour is recessive.
- (b) All white color phenotype is dominant purple color is recessive.
- (c) Purple color phenotype is co dominant, white color is also co dominant.
- (d) White color is co dominant purple colour is recessive.

141. Two plant genotypes A/a ; b/b ; C/c ; D/d ; E/e. crossing with A/a B/b ; C/c ; d/d E/e. Assume the genes assort independently. How many progeny plants are required to screen a/a b/b c/c d/d e/e : (clue : Make separate crosses for each gene to get frequency of genotypes eg : Aa x Aa):

- 1/50 or 50 progeny need to be screened.
- 1/256 or 256 or more progeny need to be screened.
- 1/132 or 132 progeny need to be screened.
- 1/16 or 16 progeny need to be screened.

142. Meta genomics refers to:

- (a) Genomics study of metabolic disease.
- (b) Genomics study of microbiome.

- (c) Genomics study of human genome.
- (d) Genomics study of plant genome.

143. Which of the following statement is CORRECT for Heterozygote advantage?

- (a) May lead to an increased incidence of autosomal dominant disorders.
- (b) Is very unlikely to be traced to a founder effect.
- (c) Does not distort Hardy Weinberg equilibrium.
- (d) May explain the world wide distribution Of sickle cell disease and malaria.

144. Which of the following in **INCORRECT** for mitochondrial disorders?

- (a) All follow matrilinear inheritance.
- (b) Less than 50 gene products from mitochondrial genome.
- (c) Retinal pigmentation and diabetes both could be features.
- (d) Leigh disease is a mitochondrial condition.

145. Which of the following options are CORRECT for immunology?

- A. The immunoglobulin molecule is made up of six polypeptide chains.
- B. The DNA encoding the 'K' light chain contains 4 distinct regions.
- C. Close relatives make the best organ donor because they are likely to share the same complement haplotypes.
- D. The diversity of T cell surface antigen receptor can be compared with the process of immunoglobulin diversity.

Choose the CORRECT answer from options:

- (a) B and D are correct.
- (b) A and B are correct.
- (c) A and C are correct.
- (d) B and C are correct.

146. Which of the following statements are CORRECT for sickle cell disease?

- A. Hbs differs from normal HbA by a single amino acid substitution.
- B. The sickling effect of red blood corpuscles is the result of abnormal Hb binding with the red cell membrane.
- C. Splenic infarction may occur but this has little clinical consequence.
- D. Life threatening thromboses can occur.

Choose the CORRECT answer from the options given below:

- (a) A, B, C are correct.
- (b) A, D are correct.
- (c) A, C, D are correct.
- (d) B, C, D are correct.

147. Which of the chemicals are used in the preparation of metaphase chromosomes for analysis of light microscopy?

- A. Phytohemagglutinin
- B. Quinacrine
- C. Colchicine
- D. Hypotonic saline

- (a) A, B, D
- (b) B, C, D
- (c) A, C, D
- (d) A, B, C

148. Given below are two statements:
Statement A: In lyonization of X chromosome inactivation, all the genes of one X chromosome are switched off.

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Statement B: In most phenotypic males with a karyotype of 46, XX. the SRY is present and found on one of the X chromosomes.

In the light of the above statements, choose the CORRECT answer from the options:

- (a) Both Statement A and Statement B are true.
- (b) Both Statement A and Statement B are false.
- (c) Statement A is true but Statement B is false.
- (d) Statement A is false but Statement B is true.

149. Which of the methods can be used for gene therapy for cancer?

- A. Inhibition of fusion protein.
- B. Stimulation of immune system.
- C. Increased expression of the angiogenic factors.
- D. RNA interference.

Choose the CORRECT answer from the options given below:

- (a) A, B, C
- (b) A, B, D
- (c) B, C, D
- (d) A, C, D

150. For pre-implantation genetic diagnosis (PGD) which of the following **DOESNOT** take place?

- (a) The use of fluorescence in situ hybridization to detect an unbalanced chromosomal abnormality.
- (b) Fetal sex determination of embryos in sex linked disease.
- (c) Testing each of the cells of the embryo for the specific mutation.
- (d) In vitro fertilization.

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
b	d	d	d	c	d	b	c	b	d	d	c	c	c	c	b	c	b	c	a
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
d	c	c	d	c	b	c	b	b	b	d	a	a	d	a	a	c	c	b	b
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
d	a	c	d	c	c	a	c	Drop	b	b	c	c	d	c	d	b	d	c	d
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
b	c	b	a	c	a	d	c	c	c	b	d	c	b	c	c	a	a	c	b
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
d	c	b	a	d	b	b	a	c	b	c	d	b	c	c	c	c	c	b	a
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
c	b	a	d	b	a	b	c	a	a	c	c	a	a	d	d	a	b	b	b
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
a	c	b	a	a	a	c	d	a	c	d	b	d	b	c	b	a	b	a	a
141	142	143	144	145	146	147	148	149	150										
b	b	d	a	a	b	c	d	b	c										