

PARTICULARS TO BE FILLED IN BY THE CANDIDATE		Question Booklet Number	2149752
Name of the Candidate		JBSL	
Roll Number			
Application Number			
Name of the Centre			
Centre Code		Paper Code	114
Date of the Test		Question Paper Series	B
Signature of the Candidate			

Maximum Marks : 100

Test Duration : 02 hours

INSTRUCTIONS

- Complete all entries on the cover page and put your signature in the space provided.
- Use only Ball Point Pen (black / blue) for making entries in the Question Booklet and the OMR Answer Sheet.

1. The Question Booklet consists of 48 pages and contains 150 questions. Count the number of pages and questions before attempting the questions. Discrepancy, if any, must immediately be brought to the notice of the Invigilator.
2. Please read important instructions given on page 2 before attempting questions.
3. The test duration as specified above shall be reckoned from the moment of distribution of the Question Booklets.
4. Blank space in the Question Booklet may be used for rough work.
5. Each question is followed by four alternative answers. Select only one answer, which you consider as the most appropriate. Shade the relevant circle against the corresponding question number on the OMR Answer Sheet. Selecting more than one answer for a question, even if one of the selected answers is correct, would result in its being treated as an incorrect answer.
6. Answers should ONLY be marked on the OMR Answer Sheet. No answer should be written / marked on the Question Booklet.
7. The candidate is required to separate the original OMR Answer Sheet and its carbonless copy at the perforation carefully after the Admission Test. He / She shall handover the original OMR Answer Sheet and the Admit Card to the Invigilator before leaving his / her seat and take with him / her the carbonless copy of the OMR Answer Sheet and the Question Booklet.
8. Failure to handover the original OMR Answer Sheet and the Admit Card will lead to cancellation of the candidature.

SEAL

IMPORTANT INSTRUCTIONS

This Question Booklet has 150 questions divided into following six sections :

Section	Subject	Question Nos.
I	English	1-25
II	Chemistry	26-50
III	Physics	51-75
IV	Mathematics	76-100
V	Biology	101-125
VI	Home Science	126-150

1. Sections I, II and III (Question No. 1-75) are compulsory.
2. Candidates will have to attempt any one Section from IV and V to be considered for admission in the Faculty of Science and/or Life Sciences.
3. Candidates will have to attempt any one Section from IV, V and VI to be considered for admission to Home Science in the Faculty of Agricultural Sciences.
4. Option for attempting Section VI (Home Science) is available to Female candidates only.

1. His promptness _____ his presence of mind.
 - (a) speak of
 - (b) speaks of
 - (c) speaks for
 - (d) speak about

2. Did the boys turn _____ for the football practice ?
 - (a) up
 - (b) over
 - (c) in
 - (d) out

3. Pick the correct option from the following for the question given below :
Whose key is that ?
 - (a) It's of John
 - (b) It's John's
 - (c) Its John
 - (d) Its John's

4. Smooth and flat walls enable sound to bounce back as an echo. _____
objects enclosed by such walls enhance noise production.
 - (a) Consequently
 - (b) In contrast
 - (c) Subsequently
 - (d) Nevertheless

I waited _____ him _____ the railway station.

- (a) for, at
- (b) to, at
- (c) for, on
- (d) to, in

6. I decided to _____ organic farming.

- (a) take up
- (b) take over
- (c) take in
- (d) take on

7. Speech distinguishes man _____ the animals.

- (a) with
- (b) from
- (c) for
- (d) of

8. From the pair of words, choose the pair that best expresses a relationship similar to that in the original pair.

Braggart : Boast ::

- (a) Trickster : Risk
- (b) Stickler : Insist
- (c) Mumbler : Enunciate
- (d) Haggler : Concede

9.

9. Indicate the meaning of the idiom, "To meet one's Waterloo."

- (a) to meet a strong adversary
- (b) to die fighting
- (c) to meet one's final defeat
- (d) to die an ignoble death

10. Battery gradually stopping to work is

- (a) break down
- (b) run down
- (c) go down
- (d) set down

11. I have no control my temper.

- (a) in
- (b) over
- (c) at
- (d) after

12. Choose the word similar in meaning to the given word
Equipoise

- (a) equal in value
- (b) equilibrium
- (c) equidistant
- (d) mid-point



Give the correct antonym of the word 'PRODIGAL'

- (a) Frugal
- (b) Ardent
- (c) Extravagant
- (d) Liberal

14. Residing in a country of which one is not yet a full-fledged citizen

- (a) lain
- (b) lease
- (c) enemy
- (d) alien

15. Select the synonym of the following word :

Volatile

- (a) Unstable
- (b) Contrary
- (c) Light
- (d) Critical

16. Choose the antonym of the following word :

Abstemious

- (a) measure
- (b) economical
- (c) unrestrained
- (d) controlled

17. Indicate the meaning of the idiom, "To read between the lines,"

- (a) to suspect
- (b) to read carefully
- (c) to understand the hidden meaning of the word
- (d) to do useless things

18. Choose the correct pair of words that best expresses a relationship similar to that expressed in the original pair.

RUFFLE : COMPOSURE

- (a) Flounce : Turmoil
- (b) Flourish : Prosperity
- (c) Provoke : Discussion
- (d) Upset : Equilibrium

19. As watchful as a

- (a) dog
- (b) hawk
- (c) guard
- (d) wolf

20. A student of the stars and other heavenly bodies and phenomenon is called an :

- (a) Astronomer
- (b) Geologist
- (c) Astrophysicist
- (d) Anthropologist



21. If you drove from Aligarh to Delhi, which way _____

- (a) you go ?
- (b) would you go ?
- (c) would you have gone ?
- (d) you will go ?

22. The social workers _____ retained by the company for more than three years.

- (a) might been
- (b) have been
- (c) has been
- (d) have had been

23. Hari runs _____ of the three of us.

- (a) faster
- (b) most fast
- (c) fastest
- (d) more faster

24. By this time next year, I _____ all my exams.

- (a) will take
- (b) will have taken
- (c) shall take
- (d) will have had taken

25. A recent survey identified the Pacific Islands as _____ place in the world to run a retreat.

- (a) a more expensive
- (b) most expensive
- (c) the most expensive
- (d) the more expensive



Section II – Chemistry

26. The shape of ClO_3^- according to VSEPR theory will be

- (a) Linear
- (b) Planar-triangular
- (c) Pyramidal
- (d) Square planar

27. Which of the following compound is most stable?

- (a) LiI
- (b) CsF
- (c) LiF
- (d) AgF_2

28. Zr and Hf have almost equal atomic and ionic radii because

- (a) of diagonal relationship
- (b) of lanthanide contraction
- (c) of actinide contraction
- (d) both belong to f-block of elements

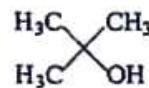
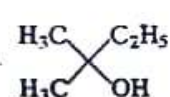
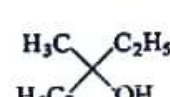
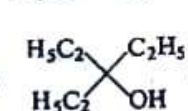
29. The orange colour of $\text{Cr}_2\text{O}_7^{2-}$ is due to

- (a) Metal to ligand charge transfer transition
- (b) Ligand to metal charge transfer transition
- (c) Crystal field transition
- (d) Charge-transfer complex formation

30. The least magnetic moment amongst the following species is of

- (a) Co^{3+}
- (b) V^{3+}
- (c) Cr^{2+}
- (d) Fe^{3+}

31. Ethyl ester $\xrightarrow[\text{excess}]{\text{CH}_3\text{MgBr}}$ P. The product P will be

- (a) 
- (b) 
- (c) 
- (d) 


32. Bithional is an example of

- (a) Disinfectant
- (b) Antibiotic
- (c) Antiseptic
- (d) Analgesic



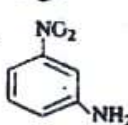
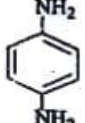
33. $\text{CaC}_2 + \text{H}_2\text{O} \rightarrow \text{A} \xrightarrow{\text{H}_2\text{SO}_4/\text{H}_2\text{SO}_4} \text{B}$

Identify A and B in above reaction

- (a) C_2H_2 and CH_3CHO
- (b) CH_4 and HCOOH
- (c) C_2H_4 and CH_3COOH
- (d) C_2H_2 and CH_3COOH

34.  $\xrightarrow{\text{HNO}_3/\text{H}_2\text{SO}_4} \text{X} \xrightarrow[\text{heat}]{\text{Sn/HCl}} \text{Y}$

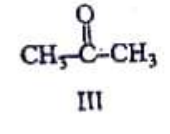
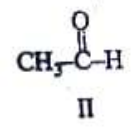
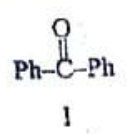
What is Y in above reaction ?

- (a) 
- (b) 
- (c) 
- (d) 

35. The oxidation of toluene to benzaldehyde by chromyl chloride is called

- (a) Cannizzaro reaction
- (b) Wurtz reaction
- (c) Etard reaction
- (d) Reimer-Tiemann reaction

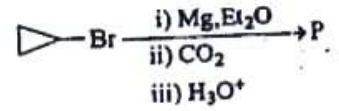
The correct order of reactivity of PhMgBr with



is

- (a) I > II > III
- (b) III > II > I
- (c) II > III > I
- (d) I > III > II

37. For the following reaction,



The product 'P' is

- (a) Cyclopropyl-COOH
- (b) $\text{Cyclopropyl-C(=O)-Cyclopropyl}$
- (c) Cyclopropyl-OH
- (d) $\text{Cyclopropyl-CH}_2\text{OH}$

38. Methyl alcohol can be distinguished from ethyl alcohol using

- (a) Fehling test
- (b) Tollen's test
- (c) Phthalic fusion test
- (d) Iodoform test

39. In H_2-O_2 fuel cell, the reaction at cathode is

- (a) $\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- (b) $\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$
- (c) $2\text{OH}^- + \text{H}_2 \rightarrow 2\text{H}_2\text{O} + 2\text{e}^-$
- (d) $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^-$

40. Which one of the following does not depend on temperature ?

- (a) standard electrode potential
- (b) specific conductance of electrolyte solution
- (c) molality of electrolyte solution
- (d) rate of electrochemical corrosion

41. Which one of the following has the highest boiling point ?

- (a) $\frac{\text{M}}{100}$ aluminium nitrate
- (b) $\frac{\text{M}}{100}$ ammonium chloride
- (c) $\frac{\text{M}}{100}$ ammonium oxalate
- (d) $\frac{\text{M}}{100}$ urea

42. At certain temperature T, the ionic product of water is 8.1×10^{-15} . Then pH of water at temperature T will be

- (a) 7.0
- (b) between 6 and 7
- (c) between 7 and 8
- (d) between 8 and 9

43. Given, K_{sp} of silver chromate is 4×10^{-12} . The silver ion concentration in saturated silver chromate solution should be
- 10^{-4} M
 - $2 \times 10^{-4} \text{ M}$
 - $2 \times 10^{-6} \text{ M}$
 - $4 \times 10^{-6} \text{ M}$
44. ΔH° of the following reaction must be the standard enthalpy of formation
- $2 \text{ C (graphite, s)} + 3 \text{ H}_2 \text{ (g)} + \frac{1}{2} \text{ O}_2 \text{ (g)} \rightarrow \text{C}_2\text{H}_5\text{OH(l)}$
 - $\text{C (diamond, s)} + \text{O}_2 \text{ (g)} \rightarrow \text{CO}_2 \text{ (g)}$
 - $\text{S (monoclinic, s)} + \text{O}_2 \text{ (g)} \rightarrow \text{SO}_2 \text{ (g)}$
 - $2 \text{ H}_2 \text{ (g)} + \text{O}_2 \text{ (g)} \rightarrow 2 \text{ H}_2\text{O(l)}$
45. Most probable velocity of gas molecules is
- average velocity of the molecules
 - root mean square velocity of the molecules
 - maximum velocity of molecules
 - velocity possessed by the highest fraction of the total number of molecules
46. The rate of a chemical reaction doubles for every 10°C rise of temperature. If the temperature is raised by 50°C , the rate of reaction increases by about :
- 24 times
 - 32 times
 - 64 times
 - 10 times

47. In lit. atm. $\text{K}^{-1} \text{ mol}^{-1}$ the numerical value of R, the gas constant is
- 82.1×10^{-2}
 - 82.1×10^{-3}
 - 82.1×10^{-4}
 - 0.821
48. The oxidation state of phosphorus in hypophosphorous acid is
- +1
 - +4
 - +5
 - +3
49. The bond order of O_2 , O_2^+ , O_2^- and O_2^{2-} have the following sequence
- $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
 - $\text{O}_2^{2-} > \text{O}_2^- > \text{O}_2 > \text{O}_2^+$
 - $\text{O}_2 > \text{O}_2^+ > \text{O}_2^{2-} > \text{O}_2^-$
 - $\text{O}_2^{2-} > \text{O}_2^- > \text{O}_2^+ > \text{O}_2$
50. The hybridization of Xe in XeOF_2 molecule is
- sp^3
 - sp^3d
 - sp^3d^2
 - sp^3d^3



Section III – Physics

51. The projection angle in terms of range R , time of flight T and speed u is given by

- (a) $\cot^{-1}(R/uT)$
- (b) $\tan^{-1}(P/uT)$
- (c) $\sin^{-1}(R/uT)$
- (d) $\cos^{-1}(R/uT)$

52. A rectangular coil of 100 turns and size $0.1 \text{ m} \times 0.05 \text{ m}$ is placed perpendicular to magnetic field of 0.1 Wb/m^2 . Calculate the induced emf when the magnetic field drops to 0.05 Wb/m^2 in 0.05 s .

- (a) 0.5 V
- (b) 1.0 V
- (c) 1.5 V
- (d) 2.0 V

53. If a battery of emf 100 V is connected in series with a inductance of 10 mH , a capacitance of $0.05 \mu\text{F}$ and a resistance of 100Ω . Find the circuit condition

- (a) Oscillatory
- (b) Dead beat
- (c) Critically damped
- (d) Not oscillatory

54. A capacitor of capacitance $1.0 \mu\text{F}$ is discharged through a resistance of $5 \text{ M}\Omega$. Find the time taken to remove half of the charge on the capacitor.

- (a) 2.0 s
- (b) 2.5 s
- (c) 3.0 s
- (d) 3.5 s

55. A rectangular wire loop of sides 6 cm and 4 cm with a small cut is moving out of a region of uniform magnetic field of magnitude 0.4 T directed normal to the loop. Find the voltage developed across the cut if the velocity of the loop is 2 cm/s in a direction normal to the longer side of the loop.

- (a) $2.4 \times 10^{-4} \text{ V}$
- (b) $4.8 \times 10^{-4} \text{ V}$
- (c) $6.4 \times 10^{-4} \text{ V}$
- (d) $8.6 \times 10^{-4} \text{ V}$

56. An a.c. generator consists of a coil of 100 turns and area 2 m^2 rotating at an angular speed of 100 rad/s in a uniform magnetic field $B = 0.5 \text{ T}$ between two fixed pole pieces. If the resistance of the circuit including that of the coil is $1 \text{ k}\Omega$, find the maximum flux through the coil

- (a) 50 Wb
- (b) 100 Wb
- (c) 150 Wb
- (d) 200 Wb



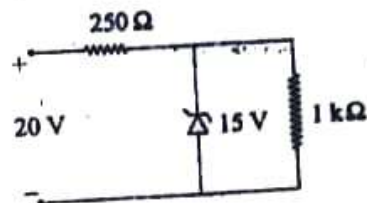
57. A solenoid of inductance 100 H and resistance 3.33Ω is connected in series with a resistance of 66Ω . The combination is then connected in series with a battery of 12 V. Find the time taken by current to reach half of its maximum value.

(a) 1 s
(b) 2 s
(c) 3 s
(d) 4 s

58. A capacitor, a 100Ω resistor and 101.5 mH inductor are placed in series with a 50 Hz a.c. source. If the current is in phase with the voltage, find the capacitance of the capacitor.

(a) $66.7 \mu\text{F}$
(b) $77.7 \mu\text{F}$
(c) $88.7 \mu\text{F}$
(d) $99.7 \mu\text{F}$

59. In the following circuit, the current through $1 \text{ k}\Omega$ resistor is



(a) 0 mA
(b) 15 mA
(c) 10 mA
(d) 20 mA

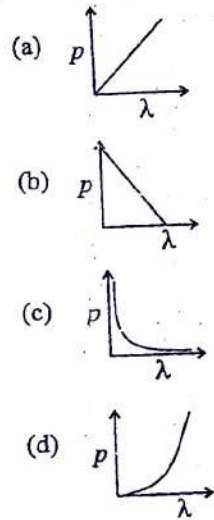
60. The electric potential at a point (x, y, z) is given by $V = -x^2y - xz^3 + C$. The electric field \vec{E} at that point is

(a) $\hat{i}(2xy + z^3) + \hat{j}x^2 + \hat{k}3xz^2$
(b) $\hat{i}(2xy - z^3) + \hat{j}xy^2 + \hat{k}3z^2x$
(c) $\hat{i}z^3 + \hat{j}xyz + \hat{k}z^2$
(d) $\hat{i}2xy + \hat{j}(x^2 + y^2) + \hat{k}(3xz - y^2)$

61. A concave mirror forms on a screen a real image of thrice the linear dimensions of the object. Object and screen are moved until the image is twice the size of the object. The ratio of the distance of the object in the first case to distance of the object in the second case is

(a) $3/4$
(b) $9/8$
(c) $8/9$
(d) $2/3$

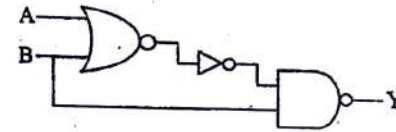
62. Which of the following graphs represents the variation of the particle momentum and the associated de Broglie wavelength?



63. Polarisation of light demonstrates the

- Quantum nature of light
- Transverse wave nature of light
- Longitudinal wave nature of light
- Corpuscular nature of light

64. The truth table for the following arrangement of gates is



(a)

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	0

(b)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

(c)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

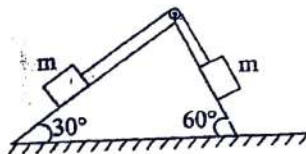
(d)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	1

65. In an adiabatic process, the pressure P and temperature ' T ' of a monoatomic gas are related as $P \propto T^c$ then c is

- (a) 1.0
- (b) 1.5
- (c) 2.0
- (d) 2.5

66. Two identical masses, each of mass ' m ' connected by an inextensible massless string passes over a fixed wedge as shown in figure. The acceleration of centre of mass of these masses is



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

67. A galvanometer having 30 divisions has a current sensitivity of $20 \mu\text{A/division}$. It has a resistance of 25 ohms. The shunt required to convert it into an ammeter of range 1 Ampere is

- (a) 15Ω
- (b) 1.5Ω
- (c) 0.15Ω
- (d) 0.015Ω

68. The M.K.S. unit of $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$ is

- (a) meter²-second²
- (b) meter²/second²
- (c) meter-second
- (d) meter per second

69. If the force on some particle at a distance r and time t is given by

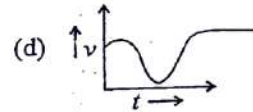
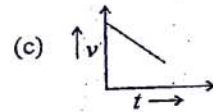
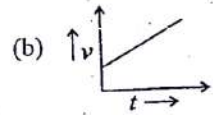
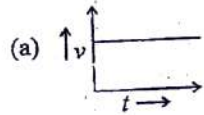
$$F = -\alpha r + \frac{\beta}{r^2} e^{-\gamma t}, \text{ the dimension of } \alpha/\beta \text{ and } \gamma \text{ respectively is}$$

- (a) L^3 and T^{-1}
- (b) L^{-3} and T^1
- (c) L^{-3} and T^{-1}
- (d) L^3 and T^1

70. Momentum of a particle has been measured to be $(74.5 \pm 0.67) \times 10^3$ g-cm/second. The absolute and relative uncertainty associated with it are

- (a) -0.67×10^3 g-cm/s and -0.009
- (b) 0.67×10^3 g-cm/s and 0.009
- (c) -0.67×10^3 g-cm/s and -0.09
- (d) 0.67×10^3 g-cm/s and 0.09

71. The motion of a free particle is represented by the following $v-t$ graph.



72. A particle of mass 3 kg moves under a force of $(4\hat{i} + 8\hat{j} + 10\hat{k}) \text{ N}$. If the particle starts at rest from origin, the distance travelled by it between 4th to 6th second is

- (a) 22.3 m
(b) 44.7 m
(c) 16.3 m
(d) 24.3 m

73. Which of the following is correct?

(a) $\vec{P} \cdot \vec{Q} \neq \vec{Q} \cdot \vec{P}$

(b) $\vec{A} \times \vec{B} \neq \vec{B} \times \vec{A}$

(c) $\vec{A} \cdot (\vec{B} \times \vec{C}) \neq \vec{B} \cdot (\vec{C} \times \vec{A})$

(d) $\vec{A} \times (\vec{B} \times \vec{C}) \neq -\vec{A} \times (\vec{C} \times \vec{B})$

74. The minimum co-efficient of friction to prevent skidding of the car moving at a speed of 54 km/hr on a circular road track of radius 33.6 meter is

- (a) 0.46
(b) 0.34
(c) 0.046
(d) 0.68

75. The work done on a body of mass 5 kg in half revolution during the motion on a circle of diameter 2 m and having a time period of 22 seconds is

- (a) 0.2 Joule
(b) Zero
(c) 0.42 Joule
(d) 0.36 Joule

5 kg

Section IV – Mathematics

76. The solution of the inequality $\frac{(x-1)^2(x+1)^3}{x^4(x-2)} \leq 0$ is

- (a) $[-1, 0) \cup (0, 2)$
- (b) $(2, +\infty)$
- (c) $(-1, 0) \cup (0, 2]$
- (d) $(-\infty, -1)$

77. For what value of eccentricity of an ellipse the rhombus BSB'S' will be a square? Where BB' is minor axis and S, S' are foci of the ellipse

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

78. The complex number z is such that $|z| = 1$ and $z \neq -1$ and $W = \frac{z-1}{z+1}$.

Then the real part of W is

- (a) $\frac{1}{|z+1|^2}$
- (b) $\frac{-1}{|z+1|^2}$
- (c) $\frac{\sqrt{2}}{|z+1|^2}$
- (d) 0

79. The sum of the first three terms of an increasing geometric progression is 13 and their product is 27. Then the sum of the first five terms of the progression is

- (a) 121
- (b) 112
- (c) 118
- (d) 131

80. The locus of point z satisfying $\operatorname{Re}\left(\frac{1}{z}\right) = k$, where k is a non-zero real number, is

- (a) a circle
- (b) an ellipse
- (c) a hyperbola
- (d) a parabola

81. The values of function $4 \cos^2 \theta + 3 \sin^2 \theta - \cos 2\theta$ lies in the interval

- (a) $[3, 4]$
- (b) $[1, 2]$
- (c) $[-3, -4]$
- (d) $[0, 1]$

82. If A is a square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$, where I is identity matrix, is equal to

- (a) A
- (b) $I - A$
- (c) I
- (d) $3A$

83. Let $R = \{(a, a), (b, b), (c, c), (a, b)\}$ be a relation defined on the set $X = \{a, b, c\}$. Then, which one of the following statements is correct regarding the relation R .

- (a) R is reflexive and transitive
- (b) R is an equivalence relation
- (c) R is reflexive but not transitive
- (d) R is transitive but not reflexive

84. In a quadratic equation with leading coefficient 1, a student read the coefficient 16 of x wrongly as 19 and obtains the roots as -15 and -4 . The correct roots are

- (a) $-7, -9$
- (b) $6, 10$
- (c) $-6, -10$
- (d) $8, 12$

85. If the sum of mean and variance of a binomial distribution of 5 trials is 1.8, then the mean of the distribution is

- (a) 0.2
- (b) 0.6
- (c) 0.8
- (d) 1.0

86. For n independent events A_i 's, $P(A_i) = \frac{1}{1+i}$, $i = 1, 2, \dots, n$, probability that at least one of the events occur is

- (a) $\frac{1}{n}$
- (b) $\frac{1}{n+1}$
- (c) $\frac{n}{n+1}$
- (d) none of these

87. If $N = \underline{1} - \underline{2} + \underline{3} - \underline{4} + \dots + \underline{47} - \underline{48} + \underline{49} - \underline{50}$, then the unit digit of N^N is

- (a) 0
- (b) 1
- (c) 2
- (d) 3

88. ${}^{47}C_4 + \sum_{j=1}^5 {}^{52-j}C_3$ is equal to

- (a) ${}^{52}C_4$
- (b) ${}^{51}C_4$
- (c) ${}^{52}C_3$
- (d) ${}^{50}C_4$

89. In a right angled triangle ABC, the hypotenuse $AB = p$, then

$$\vec{AB} \cdot \vec{AC} + \vec{BC} \cdot \vec{BA} + \vec{CA} \cdot \vec{CB} \text{ is equal to}$$

- (a) $2p^2$
 (b) $\frac{p^2}{2}$
 (c) p^2
 (d) none of these
90. If the centroid and circumcentre of a triangle are (x, y) and $(6, 2)$ then for orthocentre $(-3, 5)$ the values of x and y are
- (a) $(5, -3)$
 (b) $(3, 3)$
 (c) $(1, 1)$
 (d) $(2, 6)$
91. The area of triangle formed by the lines $y = cx$, $x + y - c = 0$ and the y -axis is equal to
- (a) $\frac{1}{2|1+c|}$
 (b) $\frac{c^2}{|1+c|}$
 (c) $\frac{1}{2} \left| \frac{c}{1+c} \right|$
 (d) $\frac{c^2}{2|1+c|}$

92. The projection of the vector $\hat{i} + 2\hat{j} + 2\hat{k}$ on the line joining the points $(1, 2, 3)$ and $(3, 4, 7)$ is

- (a) $\frac{13}{\sqrt{6}}$
 (b) $\frac{11}{\sqrt{6}}$
 (c) $\frac{9}{\sqrt{6}}$
 (d) $\frac{7}{\sqrt{6}}$

93. The angle between a vector with direction ratios proportional to $1, 1, 1$ and a vector joining $(2, 1, 4)$ to $(3, 0, 5)$, is

- (a) $\cos^{-1}\left(\frac{1}{2}\right)$
 (b) $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$
 (c) $\cos^{-1}\left(\frac{1}{3}\right)$
 (d) $\cos^{-1}\left(\frac{2}{3}\right)$

94. $\int \tan^{-1} x \, dx$ equals to

- (a) $x \tan^{-1} x - \frac{1}{2} \log(1+x^2)$
- (b) $x \tan^{-1} x + \frac{1}{2} \log(1+x^2)$
- (c) $\tan^{-1} x - \frac{1}{2} \log(1+x^2)$
- (d) $\tan^{-1} x + \frac{1}{2} \log(1+x^2)$

95. If $y = (f \circ f \circ f)(x)$ and $f(0) = 0, f'(0) = 2$, then $y'(0)$ is equal to

- (a) 6
- (b) 7
- (c) 8
- (d) 16

96. If $f: [0, \infty) \rightarrow [0, \infty)$ is a function defined by $f(x) = \frac{x}{1+x}$, then

- (a) f is one-one and onto
- (b) f is one-one but not onto
- (c) f is onto but not one-one
- (d) f is neither one-one nor onto

97. $\lim_{x \rightarrow 0} \left(\frac{\tan x}{x} \right)^{\frac{1}{x^3}}$ equals to

- (a) ∞ on the right, 0 on the left
- (b) ∞ on the right, $-\infty$ on the left
- (c) ∞
- (d) 0

98. The differential equation which has $y = a \cos(mx + b)$ as its general solution, where a and b being arbitrary constants and m being a fixed constant, is :

- (a) $\left(\frac{dy}{dx} \right)^2 + m^2 y^2 = m^2 a^2$
- (b) $\frac{d^2 y}{dx^2} - m^2 y = 0$
- (c) $\frac{d^2 y}{dx^2} + m^2 y = 0$
- (d) $\left(\frac{dy}{dx} \right)^2 - m^2 y^2 = m^2 a^2$

99. The solution of differential equation $\frac{dy}{dx} = e^{x+y} + x^2 e^y$, is

- (a) $\frac{x^3}{3} + e^x + e^{-y} = C$
- (b) $\frac{x^3}{3} - e^x + e^{-y} = C$
- (c) $\frac{x^3}{3} + e^x - e^{-y} = C$
- (d) $\frac{x^3}{3} + e^x + e^{-y} = C$

100. The area of the region enclosed by the curve $x = a(t - \sin t), y = a(1 - \cos t), 0 \leq t \leq 2\pi$ is

- (a) πa^2
- (b) $2\pi a^2$
- (c) $\frac{\pi a^2}{2}$
- (d) $3\pi a^2$

Section V – Biology

101. The term humulin is used for

- (a) an antibiotic
- (b) isoenzyme
- (c) homogenate of *Hirudinaria*
- (d) human insulin

102. Restriction enzymes are isolated chiefly from :

- (a) Fungi
- (b) Protists
- (c) Prokaryotes
- (d) Protozoans

103. Which of the following is not a vitamin deficiency disease ?

- (a) Pellagra
- (b) Scurvy
- (c) Beri Beri
- (d) Marasmus

104. Which of the following sponge is present in river ?

- (a) *cliona*
- (b) *spongilla*
- (c) *sycon*
- (d) *hyalonema*

105. The body cavity of *Hirudo* is filled with

- (a) Connective tissue
- (b) Parenchyma tissue
- (c) Botryoidal tissue
- (d) Coelomic fluid

106. Which of the following is not immunosuppressant ?

- (a) purine analogs
- (b) folic acid antagonists
- (c) γ -rays
- (d) endotoxins of gram negative bacteria

107. When released from ovary, human egg contains

- (a) Two X-chromosomes
- (b) One X-chromosome
- (c) One Y-chromosome
- (d) XY-chromosomes

108. Which of the following vitamin help in formation and maintenance of collagen in connective tissue ?

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

109. Merkel's disc are present on

- (a) Skin
- (b) Internal nares
- (c) Brain
- (d) Internal Ear

110. Lactase is found in

- (a) Saliva
- (b) Pancreatic juice
- (c) Bile
- (d) Intestinal juice

111. The most abundant immunoglobulin in human body is

- (a) Ig M
- (b) Ig G
- (c) Ig A
- (d) Ig E

112. Cancer cells can easily be destroyed by radiations due to

- (a) lack of oxygen
- (b) rapid cell division
- (c) lack of nutrition
- (d) fast mutation

113. Opening of flower and dropping of a bud are examples of :

- (a) movement of curvature
- (b) seismonasty
- (c) spontaneous movement
- (d) epinastic movement

114. A quantasome comprises of :

- (a) PSI
- (b) PSII
- (c) PSI and PSII
- (d) Two photosynthetic unit

115. In Gymnosperms, the microspore develops into :

- (a) Protonema
- (b) Antheridium
- (c) Male Gametophyte
- (d) Female Gametophyte

116. What are the correct endings of the names of a subfamily and a suborder, respectively ?

- (a) -inae and -ales
- (b) -oideae and -inae
- (c) -inae and -oidae
- (d) -oideae and -inae

117. The hydrocolloid 'Algin' is obtained from :

- (a) Blue green Algae
- (b) Green Algae
- (c) Brown Algae
- (d) Red Algae

118. A gymnosperm has $2n = 40$ and an angiosperm has $n = 14$. What will be the expected number of chromosomes in their respective endosperms ?

- (a) 20 and 42
- (b) 60 and 42
- (c) 20 and 28
- (d) 60 and 28

119. Which one of the following is associated with flowering in plants ?

- (a) Cytochrome
- (b) Phytochrome
- (c) Cryptochrome
- (d) Chlorophyll

120. Which of the following is a component of the valuable triple response of seedlings to ethylene ?

- (a) stem elongation slows, root elongation slows, and stems thicken and bend into a tough hook.
- (b) stems bend into an S-shaped structure, roots form a hook, and root hooks appear above the soil.
- (c) stems elongate rapidly, roots elongate rapidly, and roots bend upward.
- (d) stems remain mostly underground, leaves emerge from the soil, and roots elongate rapidly.

121. Mobile electron carriers of mitochondrial electron transport chain are :

- (a) FAD and cytochrome C_1
- (b) Cytochrome a and $\text{cyt } a_3$
- (c) CoQ and cytochrome C
- (d) $\text{Cyt } b_1$ $\text{cyt } C$

122. A bulk of the plant cell organelle, chloroplast is burnt in a furnace. Which mineral element will be left mainly ?

- (a) iron
- (b) sulphur
- (c) magnesium
- (d) carbon

123. Which of the following mineral element is required for the proper activity of DNA polymerase ?

- (a) K
- (b) P
- (c) Mo
- (d) Ca

124. Stress hormone capable of closing stomata, under water stress is

- (a) ABA
- (b) IAA
- (c) IBA
- (d) NAA

125. What genotypes and their proportions would be produced if parents with blood group genotype $I^A I^B$ and $I^A i$ are crossed ?

- (a) $\frac{1}{4} I^A I^A : \frac{1}{4} I^A i : \frac{1}{4} I^A I^B : \frac{1}{4} I^B i$
- (b) $\frac{1}{4} I^A I^A : \frac{1}{2} I^A I^B : \frac{1}{4} I^B I^B : \frac{1}{2} I^B i$
- (c) $\frac{1}{2} I^A I^A : \frac{1}{2} I^A i : \frac{1}{2} I^A I^B : \frac{1}{2} I^B i$
- (d) $\frac{1}{2} I^A I^A : \frac{1}{4} I^A I^B : \frac{1}{2} I^B I^B : \frac{1}{4} I^B i$

Section VI – Home Science

126. The natural fibres which are short and measured in inches are known as

- (a) small fibres
- (b) staple fibres
- (c) stable fibres
- (d) flock fibres

127. Which of the following is the regenerated man made fibre ?

- (a) Rayon
- (b) Nylon
- (c) Polyester
- (d) Terrycot

128. Buttons, Zippers and Hooks are the examples of

- (a) Drape
- (b) Plackets
- (c) Fasteners
- (d) Seams

129. Fat-soluble vitamins are

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

130. Any time that is utilized for activities other than those of duty is termed as

- (a) Leisure
- (b) Peak Loads
- (c) Life-Stages Cycle
- (d) Fatigue

131. A series of decisions concerning sequences of action is called

- (a) Planning
- (b) Controlling
- (c) Evaluation
- (d) Feedback

132. In which of the following, objects of equal interest and weight are placed at equal distance from a central point of interest ?

- (a) Formal Balance
- (b) Informal Balance
- (c) Opaque Balance
- (d) Stylized Balance

133. Malaria is a

- (a) Bacterial disease
- (b) Protozoal disease
- (c) Fungal disease
- (d) Viral disease

134. AIDS stand for

- (a) Acquired Immuno-deficiency syndrome
- (b) Human Immuno-virus syndrome
- (c) Acquired Iodine deficiency syndrome
- (d) Acquired Infection deficiency syndrome

135. Hearing handicap classified as marginal, comes in terms of degree of hearing loss

- (a) 20 – 30 dB
- (b) 40 – 50 dB
- (c) 75+ dB
- (d) 30 – 40 dB

136. In which year the integrated child development scheme was launched ?

- (a) 1976
- (b) 1977
- (c) 1975
- (d) 1965

137. Two middle lower incisors erupt at

- (a) 6-8 months
- (b) 8-12 months
- (c) 12-14 months
- (d) 12-15 months

138. The initial weight of an infant doubles by the time child is

- (a) 6 months
- (b) 8 months
- (c) 1 year
- (d) 1.5 year

139. Name the process in which wool is treated with a dilute solution of calcium or sodium hypochlorite to reduce shrinkage

- (a) Decating
- (b) Chemical treatment
- (c) London shrinking
- (d) Chlorination

140. According to Engel's law of consumption as income increases, the proportion of the income spent on food decreases, though the actual amount of money spent on food

- (a) Increases
- (b) Decreases
- (c) Both (a) and (b)
- (d) Remains unchanged

141. Wheat germ oil contains

- (a) 120 mg vitamin E/100 g oil
- (b) 100 mg vitamin E/100 g oil
- (c) 50 mg vitamin E/100 g oil
- (d) 20 mg vitamin E/100 g oil

142. Which of the following is also known as fruit sugar?

- (a) Galactose
- (b) Dextrose
- (c) Fructose
- (d) Mannose

143. When lifting loads, which muscles should be used

- (a) leg muscle
- (b) back muscle
- (c) hand muscle
- (d) waist muscle

144. "The eye gets carried first to the most important thing in any arrangement." This comes under which principle of design?

- (a) Rhythm
- (b) Emphasis
- (c) Harmony
- (d) Balance

145. Building Bye Laws are

- (a) Homes with ventilation
- (b) Spaces with safety and security
- (c) Adequate allowances for drainages
- (d) Housing norms and standards

146. Ikebana is which style of flower arrangement?

- (a) Oriental
- (b) Brazilian
- (c) Russian
- (d) Turkish

147. Which of the following is a rigid standard?

- (a) Dressing up casually for office
- (b) Following religious customs and rites
- (c) Inter-community marriage
- (d) Participation in dance festival

148. Children start sitting with support from the age of

- (a) 2 months onwards
- (b) 3 months onwards
- (c) 4 months onwards
- (d) 5 months onwards

149. The ability of an individual to resist disease and death is called

- (a) Immunity
- (b) Resistancy
- (c) Continuity
- (d) Potentiality

150. Name the point at which a yarn changes its position from one side of the fabric to the other

- (a) Interlocking
- (b) Interlacing
- (c) Interwinding
- (d) Interlining

ALIGARH MUSLIM UNIVERSITY, ALIGARH
Answer Key B.Sc. (Hons.) Admission Test 2020-21
SERIES: B

Q.No.	Answer
1	B
2	A
3	B
4	A
5	A
6	A
7	B
8	B
9	C
10	B
11	B
12	B
13	C
14	D
15	A
16	C
17	C
18	D
19	B
20	A
21	B
22	B
23	C
24	B
25	C
26	C
27	C
28	B
29	B
30	B
31	A
32	C
33	A
34	B
35	C
36	C
37	A
38	D
39	B
40	C

Q.No.	Answer
41	A
42	C
43	B
44	A
45	D
46	B
47	B
48	A
49	A
50	B
51	D
52	A
53	A
54	D
55	B
56	B
57	A
58	D
59	B
60	A
61	C
62	C
63	B
64	A
65	D
66	C
67	D
68	D
69	C
70	B
71	A
72	B
73	B
74	D
75	B
76	A
77	A
78	D
79	A
80	D

Q.No.	Answer
81	C
82	B
83	A
84	A
85	C
86	A
87	A
88	C
89	C
90	B
91	D
92	D
93	C
94	A
95	C
96	B
97	A
98	C
99	A
100	D
101	D
102	C
103	D
104	B
105	C
106	D
107	B
108	C
109	A
110	D
111	B
112	B
113	D
114	C
115	C
116	B
117	C
118	A
119	B
120	A

Q.No.	Answer
121	C
122	C
123	A
124	A
125	A
126	B
127	A
128	C
129	A
130	A
131	A
132	A
133	B
134	A
135	D
136	C
137	A
138	A
139	D
140	A
141	A
142	C
143	A
144	B
145	D
146	A
147	B
148	C
149	A
150	B

COORDINATOR
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