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MM : 720

NEET 720-MOCK TEST SERIES for NEET-2022

Time : 3 Hrs.

MOCK TEST - 2

Complete Syllabus of NEET

Instructions:

(i) There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.

(ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.

(iii) Use blue/black ballpoint pen only to darken the appropriate circle.

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

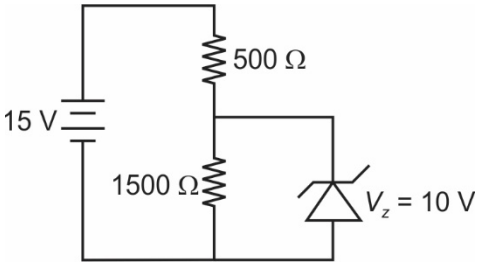
(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

PHYSICS

Choose the correct answer:

SECTION-A

1. In the circuit given, the current through the Zener diode is



(1) 3.33 mA (2) 5 mA

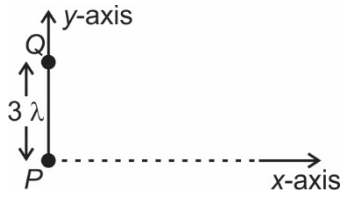
(3) 6.67 mA (4) 10 mA

2. An ideal gas is expanding such that PT^2 = constant. The coefficient of volume expansion of the gas is

(1) $\frac{1}{T}$ (2) $\frac{2}{T}$

(3) $\frac{3}{T}$ (4) $\frac{4}{T}$

3. Two coherent light sources P and Q are at a distance 3λ from each other as shown in the figure. The distance from P on the x-axis at which constructive interference may take place is



(1) $\frac{\lambda}{4}$ (2) 3λ

(3) 4λ (4) 2λ

4. The electrostatic potential inside a charged spherical ball is given by $V = b - ar^2$, where r is the distance from the centre; a and b are constants. Then the volume charge density inside the ball (assuming uniform) is

(1) $6a\varepsilon_0$ (2) $6a\varepsilon_0 r$

(3) $24\pi a\varepsilon_0$ (4) $24\pi a\varepsilon_0 r$

5. Wavelengths of light used are λ_1 = 4000 Å and λ_2 = 5000 Å then ratio of resolving powers of instrument (corresponding to λ_1 and λ_2) is

(1) 4 : 5 (2) 5 : 4

(3) 9 : 1 (4) 16 : 25

6. If the ratio of concentration of electrons to that of holes in a semiconductor is $\frac{7}{5}$ and the ratio of currents is $\frac{7}{4}$, what is ratio of their drift velocities?

(1) $\frac{5}{8}$ (2) $\frac{4}{7}$

(3) $\frac{5}{4}$ (4) 1

7. Radiated energy at T K temperature is E for a spherical body of diameter d. If temperature becomes $2T$ and diameter made $\frac{d}{2}$ then radiated energy will be

(1) E (2) $4E$

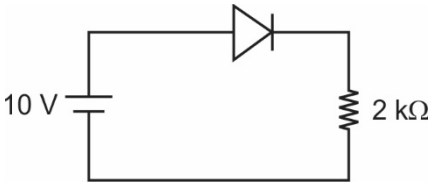
(3) $2E$ (4) $16E$

8. The maximum tension which an inextensible ring of mass 0.4 kg/m can bear is 40 N. The maximum velocity in m/s with which it can be rotated about centre is

(1) 10 (2) $\sqrt{10}$

(3) 15 (4) 20

9. In the circuit shown, if the forward voltage drop for the diode is 0.5 V, then current in circuit will be



(1) 2 mA (2) 2.5 mA

(3) 4.75 mA (4) 5 mA

10. The magnetic field at the centre of a circular current carrying loop of radius R is B_1. The magnetic field on its axis at a distance R from the centre is B_2. The value of $B_1 : B_2$ will be

(1) $\sqrt{2} : 1$ (2) $1 : \sqrt{2}$

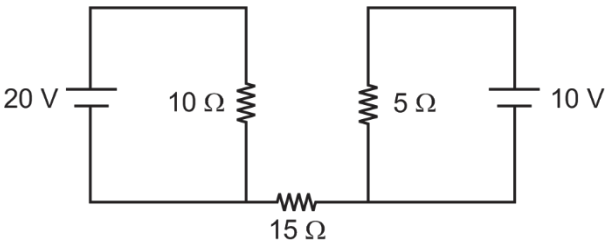
(3) $2\sqrt{2} : 1$ (4) $1 : 2\sqrt{2}$

11. A force of $(2\hat{i} + 4\hat{j} + 3\hat{k})$ N acts on a body for 2 s and produce a displacement of $(3\hat{i} + 5\hat{j} + 4\hat{k})$ m. The average power is

(1) 10 W (2) 13 W

(3) 19 W (4) 25 W

12. The electric current through 15 Ω resistance shown in electric circuit is



(1) Zero (2) 1 A

(3) 2 A (4) 3 A

13. In an electrical circuit, potential difference V = (8.0 ± 0.8) V and current I = (2.0 ± 0.2) A. The value of resistance R with error limits is

(1) (4.0 ± 1) Ω (2) (4.0 ± 0.8) Ω

(3) (4.0 ± 0.2) Ω (4) (4.0 ± 0.6) Ω

14. A particle is moving with a velocity $v = (4t^2 + 2t + 1)$ ms^{-1}. The displacement of particle in the interval t = 0 to t = 2 s is

(1) 10 m (2) $\frac{25}{3}$ m

(3) $\frac{40}{3}$ m (4) $\frac{50}{3}$ m

15. The vectors $\vec{a}$ and $\vec{b}$ each of magnitude x are inclined to each other such that their resultant is equal to $\sqrt{3}x$. Then magnitude of the resultant of $\vec{a}$ and $-\vec{b}$ is

(1) $\sqrt{3}x$ (2) $\sqrt{2}x$

(3) x (4) $3x$

16. 10 g of hot water at 60ºC is mixed with 5 g of water at 20ºC. The temperature of mixture in equilibrium is

(1) $\left(\frac{140}{3}\right)$°C (2) $\left(\frac{120}{3}\right)$°C

(3) $\left(\frac{110}{3}\right)$°C (4) $\left(\frac{160}{3}\right)$°C

17. The periodic time of a body performing SHM is 4 s. After how much time from $x = 0$ (equilibrium), will its displacement be half of its amplitude?

(1) $\frac{1}{2}$ s (2) $\frac{1}{3}$ s

(3) $\frac{1}{4}$ s (4) 1 s

18. A 200 kg satellite is revolving around earth in circular orbit of radius $2R$. Amount of energy required to transfer it to a circular orbit of radius $4R$ is [$M_e = 6 \times 10^{24}$ kg, $R = 6.4 \times 10^6$ m]

(1) 1.57×10^9 J

(2) 1.57×10^6 J

(3) 3.13×10^9 J

(4) 3.13×10^6 J

19. From the state of rest a car accelerates while engine supplied constant power P. The velocity of car varies with time as

(1) $v \propto t$ (2) $v \propto t^{\frac{1}{2}}$

(3) $v \propto t^2$ (4) $v \propto t^{\frac{3}{2}}$

20. A physical quantity depends on time t as $A = A_0 e^{-\alpha t^3}$. Then constant α has dimensions of

(1) $[T^{-1}]$ (2) $[T^{-2}]$

(3) $[T^{-3}]$ (4) $[T^0]$

21. If a body has equal amount of rotational kinetic energy and translational kinetic energy while rolling without slipping on a horizontal surface. Then body is a

(1) Ring (2) Disc

(3) Sphere (4) Uniform cylinder

22. The time period of oscillation of total energy of a harmonic oscillator having angular frequency ω is

(1) $\frac{2\pi}{\omega}$ (2) $\frac{\pi}{\omega}$

(3) $\frac{\pi}{2\omega}$ (4) Infinite

23. If the current through an inductor of 1 H is given by $i = t \sin t$, then voltage across the inductor is

(1) $\cos t + t \sin t$ (2) $-\cos t + t \sin t$

(3) $t \cos t - \sin t$ (4) $-\sin t - t \cos t$

24. An ideal gas at 27°C is compressed adiabatically to $\frac{8}{27}$ of its original volume. If $\gamma = \frac{5}{3}$, then rise in temperature is

(1) 375 K (2) 475 K

(3) 575 K (4) 675 K

25. Given that $W = \vec{F} \cdot \vec{S} = 0$ and $F \neq 0$, $S \neq 0$ then

(1) $\vec{F}$ is parallel to $\vec{S}$

(2) $\vec{F}$ is equal to $\vec{S}$

(3) $\vec{F}$ is perpendicular to $\vec{S}$

(4) None of these

26. A particle of mass m_1, making a head on elastic collision with another stationary ball of mass m_2. If m_1 rebounds with half of its original speed then $\frac{m_1}{m_2}$ is

(1) $\frac{2}{3}$ (2) $\frac{3}{2}$

(3) $\frac{1}{3}$ (4) 3

27. A particle moves in a circular orbit of radius r under a central attractive force $F = \frac{-k}{r^3}$, where k is constant. The time period of its motion is proportional to

(1) $r^{1/2}$ (2) r^2

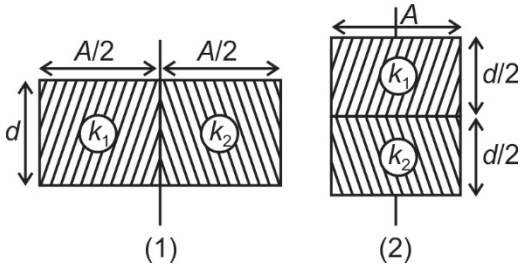
(3) $r^{1/3}$ (4) r^3

28. A transformer with turns ratio 8 : 1 has 60 Hz, 120 volt input. The frequency of output is

(1) 40 Hz (2) 60 Hz

(3) 80 Hz (4) 20 Hz

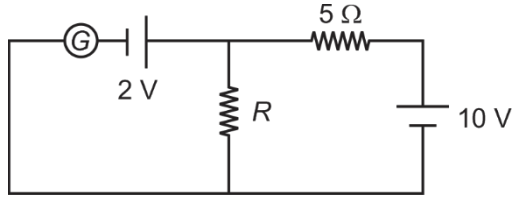
29. In the arrangement of parallel plate capacitor shown in figure, dielectrics (identical shaped) with dielectric constant $k_1 = 2$ and $k_2 = 3$ are inserted. If the capacitances are C_1 and C_2 respectively, then ratio of C_1 and C_2 is



(1) 1 : 1 (2) 15 : 9

(3) 20 : 13 (4) 25 : 24

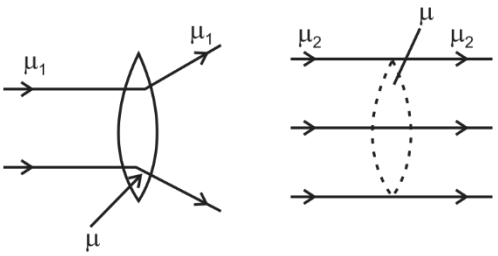
30. In the circuit shown, the galvanometer shows zero current. The value of resistance *R* is



(1) 1 Ω (2) 1.25 Ω

(3) 1.5 Ω (4) 2 Ω

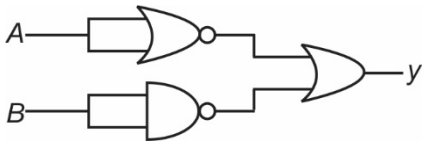
31. The correct conclusion that can be drawn from these figures is



(1) $\mu_1 < \mu$ and $\mu < \mu_2$ (2) $\mu_1 > \mu$ and $\mu > \mu_2$

(3) $\mu_1 > \mu$ and $\mu_2 = \mu$ (4) $\mu_1 < \mu$ and $\mu_2 = \mu$

32. The arrangement of the logic gates shown below effectively works as



(1) AND gate (2) OR gate

(3) NAND gate (4) NOR gate

33. An isolated system is one in which

(1) Mass does not cross boundaries of the system, though energy may do so

(2) Neither mass nor energy crosses the boundaries of the system

(3) Both energy and mass cross the boundaries of the system

(4) Mass crosses the boundary but not the energy

34. In photoelectric effect, the saturation photocurrent

(1) Depends both on intensity and frequency of the incident light

(2) Increase with increase in frequency of incident light

(3) Decreases with increase in frequency of incident light

(4) Does not depend on the frequency of incident light but depends on the intensity of incident light

35. The internal energy of an ideal gas depends on

(1) Pressure

(2) Density

(3) Temperature

(4) Change in volume

SECTION-B

36. Coefficient of friction depends upon

(1) Area of contact only

(2) Nature of surface

(3) Both (1) and (2)

(4) Neither (1) nor (2)

37. In radioactive decay process, the negatively charged emitted β-particles are:

(1) The electrons orbiting around the nucleus

(2) The electrons produced as a result of collision between atoms

(3) The electron present inside the nucleus

(4) The electrons produced a result of the decay of neutrons inside the nucleus

38. The half life of a radioactive substance is 60 days. What is the time taken to disintegrate to $\frac{1}{4}$th of its original mass?

(1) 30 days (2) 60 days

(3) 120 days (4) 240 days

39. In a nuclear reaction

$$\frac{A}{Z}X \longrightarrow Y + 2\,{}^{0}_{+1}\beta + 2\nu$$

$$Y \longrightarrow {}^{229}_{89}Z + 2\alpha + \text{Energy}$$

Determine the mass number and atomic number of element *X*?

(1) 237, 93 (2) 237, 95

(3) 237, 91 (4) 221, 84

40. The focal length of a concave mirror is 30 cm. Find the position of the object in front of the mirror (on axis), so that the image is three times the size of the object.

(1) 40 cm

(2) 20 cm

(3) 50 cm

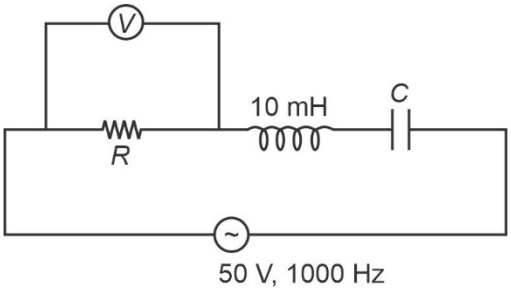
(4) Both 20 cm and 40 cm are possible

41. How many significant figures are in 0.04380 N.

(1) 2 (2) 3

(3) 4 (4) 5

42. In the given figure of circuit, the voltmeter reads 50 V. Determine the value of capacitance *C*?



(1) 2 μF (2) 2.5 μF

(3) 3 μF (4) 5 μF

43. In second orbit of hydrogen atom, wavelength of revolving electron is λ. What is its circumference?

(1) λ (2) 2λ

(3) 3λ (4) 4λ

44. The correct wavelength order for γ-rays, *X*-rays and UV-rays is given as:

(1) γ-rays > *X*-rays > UV-rays

(2) *X*-rays > γ-rays > UV-rays

(3) UV-rays > *X*-rays > γ-rays

(4) *X*-rays > UV-rays > γ-rays

45. The amplitude of the electric field in a plane electromagnetic wave, in vacuum, is 18×10^{-3} V/m. The amplitude of the magnetic field will be

(1) 3×10^{-11} T

(2) 18×10^{-3} T

(3) 6×10^{-11} T

(4) 6×10^{-3} T

46. An open and a closed organ pipe have same length. The ratio of frequency of their third overtone is

(1) $\frac{8}{7}$ (2) $\frac{4}{7}$

(3) $\frac{5}{3}$ (4) $\frac{6}{7}$

47. If the distance between a point source of light and a screen is doubled, then the intensity will be

(1) Two times of initial

(2) Four times of initial

(3) Half of initial

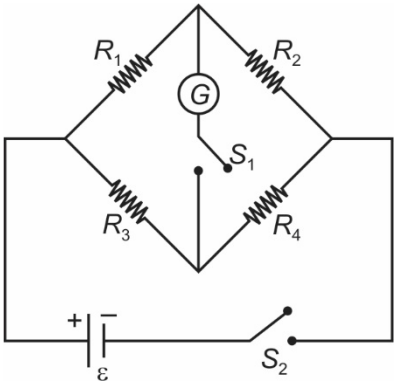
(4) One fourth of initial

48. A uniform electric field $\vec{E} = 2a\hat{i} + b\hat{j}$ passing through a surface area *A*. What is the electric flux passing through this surface area if the surface lies in *yz* plane

(1) $2aA + bA$ (2) $2aA$

(3) $A\sqrt{4a^2 + b^2}$ (4) $A(2a + b)^2$

49. In wheatstone bridge experiment as shown in the figure



If R_1 = 10 Ω, R_2 = 20 Ω, R_3 = 40 Ω, then for no current through galvanometer the value of R_4 will be

(1) 40 Ω (2) 20 Ω

(3) 80 Ω (4) 100 Ω

50. If a_r and a_t represent radial and tangential accelerations, the motion of a particle will be circular if

a. $a_r = 0$ and $a_t = 0$

b. $a_r = 0$ and $a_t \neq 0$

c. $a_r \neq 0$ and $a_t = 0$

d. $a_r \neq 0$ and $a_t \neq 0$

(1) a and d

(2) a and c

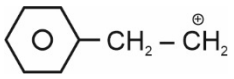
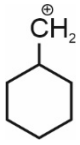
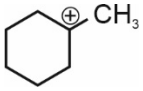
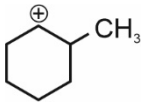
(3) c and d

(4) b and d

CHEMISTRY

SECTION-A

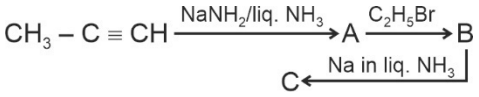
51. In which of the following carbocation rearrangement not take place?

(1) 
(2) 
(3) 
(4) 

52. Ammonia evolve by 0.1 g of an organic compound during Kjeldahl's analysis is just neutralized by 10 ml of 0.1 N H_2SO_4. The percentage of nitrogen in organic compound is

(1) 14% (2) 22%
(3) 28% (4) 32%

53. Consider the reaction sequence



The compound (C) is

(1) Cis-but-2-ene (2) Trans-pent-2-ene
(3) Trans-but-2-ene (4) Trans-pent-3-ene

54. Oxide of which element is not the cause of acid rain?

(1) Carbon (2) Sulphur
(3) Nitrogen (4) Boron

55. Which among the following is a metallic hydride?

(1) NaH (2) B_2H_6
(3) CH_4 (4) $VH_{0.56}$

56. Metal oxide is obtain on heating

(1) Li_2CO_3 (2) Na_2CO_3
(3) K_2CO_3 (4) Rb_2CO_3

57. $R_2Si(OH)_2$ on polymerisation gives

(1) Crosslink silicone
(2) Linear silicone
(3) Orthosilicate
(4) Pyrosilicate

58. The number of electrons in 2g H_2^+ is

(1) $2N_A$ (2) N_A
(3) $1.5N_A$ (4) $2.5N_A$

59. The angular momentum of electron in 3rd orbit of H-atom is

(1) $\frac{h}{2\pi}$ (2) $\frac{h}{\pi}$
(3) $\frac{3h}{2\pi}$ (4) $\frac{5h}{2\pi}$

60. Electromagnetic radiation having maximum frequency among the following is

(1) UV rays (2) IR waves
(3) Radio waves (4) X-rays

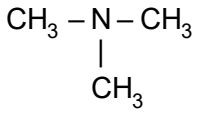
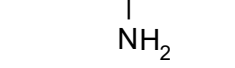
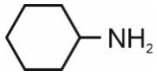
61. When vapours of tertiary alcohol is passed over heated copper at 573 K, the product formed is

(1) Aldehyde (2) Carboxylic acid
(3) Ketone (4) Alkene

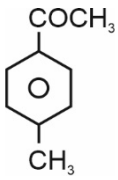
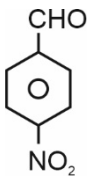
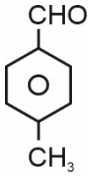
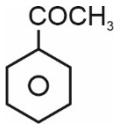
62. pK_a value is minimum for

(1) HCOOH
(2) FCH_2COOH
(3) NO_2CH_2COOH
(4) $C_6H_5CH_2COOH$

63. An amine which does not react with Hinsberg's reagent is

(1) $CH_3 - NH - C_2H_5$ (2) 
(3) 
(4) 

64. Which one is least reactive towards nucleophilic addition reaction?

(1) 
(2) 
(3) 
(4) 

65. If 0.01 M CH_3COOH has molar conductance 19.5 ohm cm^2 mol^{-1} then its degree of dissociation will be [Given: $\lambda^{\circ}_{m}(H^+)$ and λ° (CH_3COO^-) as 349.1 and 40.9 S cm^2 mol^{-1} respectively]

(1) 0.05 (2) 0.08

(3) 0.02 (4) 0.1

66. In mercury cell, which is used as an electrolyte?

(1) Paste of HgO mixed with H_2SO_4

(2) Paste of KOH and ZnO

(3) Paste of NH_4Cl and $ZnCl_2$

(4) dil. HCl

67. The rate constant for a reaction is 1.5×10^{-3} mol $L^{-1}s^{-1}$. The order of the reaction is

(1) First (2) Third

(3) Zero (4) Second

68. The possible value of temperature coefficient of most of the reactions among the following is

(1) 1 (2) 0.5

(3) 2.5 (4) 4.7

69. Which is not a colloidal solution?

(1) Air (2) Milk

(3) Smoke (4) Blood

70. Hybridisation of iron in $Fe(CO)_5$ is

(1) sp^3d (2) sp^3d^2

(3) dsp^2 (4) d^2sp^3

71. Which of the following species show geometrical isomerism?

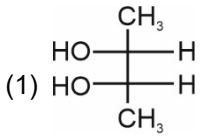
(1) $[Cr(H_2O)_5Cl]Cl_2$

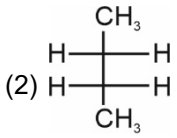
(2) $[Pt(NH_3)_3Cl]Cl$

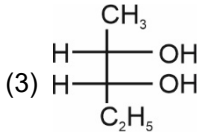
(3) $[Co(en)_3]^{3+}$

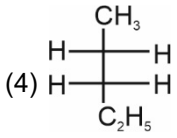
(4) $[Co(NH_3)_3(NO_2)_3]$

72. Optically active compound among the following is

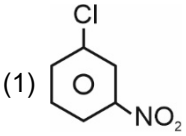
(1) 

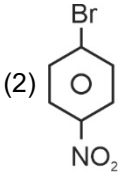
(2) 

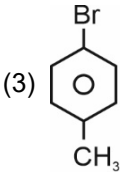
(3) 

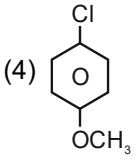
(4) 

73. Which of the following compounds will undergo nucleophilic substitution reaction most easily?

(1) 

(2) 

(3) 

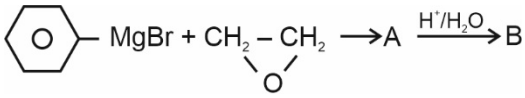
(4) 

74. In Williamson's synthesis alkyl halide is allowed to react with

(1) Sodium acetate (2) Sodium ethoxide

(3) Sodamide (4) Sodium oxalate

75. Consider the reaction



The compound (B) is

(1) Phenol (2) 1º-Alcohol

(3) 2º-Alcohol (4) Benzoic acid

76. The product obtain when the mixture of CH_4 and O_2 is passed over Mo_2O_3 at 543 K at 100 atm pressure is

(1) HCHO (2) CH_3OH

(3) HCOOH (4) CO_2

77. Most effective coagulant for As_2S_3 sol is

(1) $K_4[Fe(CN)_6]$ (2) $MgCl_2$

(3) $AlPO_4$ (4) KCl

78. Which of the following orders of ionic radii is correctly represented?

(1) $Na^+ > F^- > O^{2-}$ (2) $H^+ > H > H^-$

(3) $K^+ > Cl^- > S^{2-}$ (4) $N^{3-} > Na^+ > Mg^{2+}$

79. Maximum dipole moment among the following is of

(1) CO_2 (2) BF_3

(3) H_2O (4) NF_3

80. In which of the following molecules the central atom does not have sp^3d hybridization?

(1) BrF_5 (2) XeF_2

(3) ClF_3 (4) SF_4

81. Which of the following salt do not undergo hydrolysis?

(1) NH_4Cl (2) KCN

(3) CH_3COONa (4) $NaNO_3$

82. The active mass of 2 g $H_2(g)$ in 1 L container will be

(1) 0.5 (2) 1.5

(3) 2 (4) 1

83. The equivalent mass of Cl_2 (molar mass = M) is the given reaction is

$$Cl_2 \xrightarrow{\text{dilute NaOH}} NaCl + NaClO + H_2O$$

(1) M (2) $\frac{M}{2}$

(3) $\frac{M}{3}$ (4) $\frac{3M}{2}$

84. Dispersion forces are present in which of the following pairs?

(1) HCl and He (2) O_2 and N_2

(3) H_2O and HF (4) HCl and SO_2

85. Assume each reaction is carried out in open vessel. For which reaction will $\Delta H = \Delta E$?

(1) $C(s) + \frac{1}{2}O_2(g) \rightarrow CO(g)$

(2) $2B(s) + \frac{3}{2}O_2(g) \rightarrow B_2O_3(s)$

(3) $C(s) + O_2(g) \rightarrow CO_2(g)$

(4) $CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g)$

SECTION-B

86. The number of tetrahedral void(s) per atom present in a cubic close-packed structure is

(1) 1 (2) 2

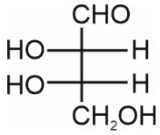
(3) 3 (4) 4

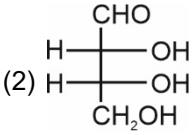
87. Elevation in boiling point for 0.1 m glucose, 0.1 m KCl and 0.1 m Na_2SO_4 are in the ratio of

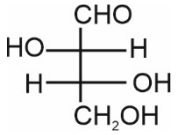
(1) 1 : 2 : 7 (2) 3 : 2 : 1

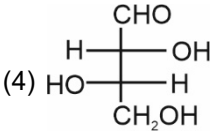
(3) 1 : 2 : 2 (4) 1 : 2 : 3

88. L- erythrose among the following is

(1) 

(2) 

(3) 

(4) 

89. Dacron is a

(1) Polyamide (2) Polycarbonate

(3) Polyester (4) Polythene

90. Butylated hydroxy anisole is used as

(1) Sweetener (2) Preservative

(3) Emulsifier (4) Antioxidant

91. Alkenes on reaction with Baeyer's reagent produce

(1) Aldehydes (2) Vicinal glycols

(3) Ketones (4) Carboxylic acids

92. IUPAC name of $C_6H_5OCH_2CH_3$ is

(1) Ethoxy benzene (2) Phenetole

(3) Anisole (4) Ethylphenyl ether

93. Salicylaldehyde can be obtained by

(1) Kolbe's reaction

(2) Etard's oxidation

(3) Reimer-Tiemann reaction

(4) Gattermann-Koch reaction

94. The incorrect option regarding N-substituted derivative of aldehydes and ketones is

	Reagent name	Carbonyl derivative	Product name
(1)	Hydroxylamine	> C = N – OH	Oxime
(2)	Phenylhydrazine	> C = N – NH–⬡	Phenylhydrazone
(3)	Semicarbazine	> C = N – $NHCONH_2$	Semicarbazone
(4)	Amine	> C = NR	Hydrazone

95. Maximum boiling point among the following is of

(1) n-butane (2) Acetone

(3) Methoxy ethane (4) Propanal

96. Which of the following gas always shows positive deviation from ideal gas behaviour?

(1) CH_4 (2) CO_2

(3) He (4) O_2

97. In which case change in entropy is negative?

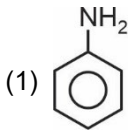
(1) $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$

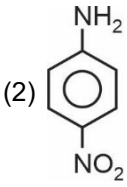
(2) $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

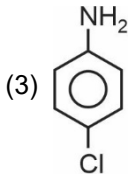
(3) $S_8(s) + 8O_2(g) \rightarrow 8SO_2(g)$

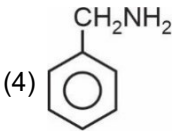
(4) H_2O (liq.) $\rightarrow H_2O$ (vapour)

98. Most basic compound among the following is

(1) 

(2) 

(3) 

(4) 

99. The correct order of boiling point is

(1) $NH_3 > PH_3 > AsH_3 > SbH_3$

(2) $SbH_3 > AsH_3 > PH_3 > NH_3$

(3) $NH_3 > SbH_3 > AsH_3 > PH_3$

(4) $SbH_3 > NH_3 > AsH_3 > PH_3$

100. Aqua regia is formed by mixing

(1) $HCl + HNO_3$ (2) $H_2SO_4 + HNO_3$

(3) $HCl + H_2SO_4$ (4) $HClO_4 + H_2SO_4$

BOTANY

SECTION-A

101. Tendrils in plants can be all of the following, **except**

(1) Modified axillary buds

(2) Perennating organs

(3) Modified leaves

(4) Climbing organs

102. Type of leaf in *Solanum nigrum* is __A__ and flowers are __B__ .

Select the **correct** option to fill in the blanks A and B.

	A	B
(1)	Simple	Hypogynous
(2)	Pinnately compound	Perigynous
(3)	Simple	Epigynous
(4)	Palmately compound	Epigynous

103. At maturity, which of the following elements of the vascular tissues in angiosperms are dead?

a. Sieve tube

b. Phloem fibre

c. Vessel

d. Companion cell

e. Tracheid

The **correct** ones are

(1) c and e only

(2) a, c and e

(3) a and d

(4) b, c and e

104. Select the **incorrect** statement from the following.

(1) Endodermis in roots is characterised by casparian strips

(2) Innermost layer of cortex in monocot stem is endodermis

(3) Lateral roots in angiosperms are initiate from pericycle

(4) All the tissues on the inner side of the endodermis constitute the stele

105. Which system of classification for flowering plants was given by Bentham and Hooker?

(1) Phylogenetic system

(2) Natural system

(3) Cytotaxonomy

(4) Artificial system

106. Select the **incorrectly** matched pair.

(1) *Chlamydomonas* – Isogamous reproduction

(2) *Funaria* – Leafy gametophyte

(3) *Equisetum* – Sporic meiosis

(4) *Eucalyptus* – Archegoniate

107. If the pressure greater than atmospheric pressure is applied to pure water then

(1) Its water potential will be a negative value

(2) Its water potential will remain zero

(3) Its water potential will be a positive value

(4) Its osmotic pressure will increase

108. Which of the following phenomena is **not** concerned with the opening of stomata in light?
(1) Dissociation of malic acid into malate ion and protons in the guard cells
(2) Transportation of H^+ from guard cells to other epidermal cells
(3) Storage of potassium malate in the vacuoles of guard cells
(4) Increase in the concentration of CO_2 in sub-stomatal cavity

109. "The parent body as a whole forms reproductive unit". This statement is true for
(1) *Amoeba* (2) *Penicillium*
(3) *Hydra* (4) *Spirogyra*

110. Regarding interflowering period, choose the plant which is **odd one out**.
(1) Carrot (2) Grapevine
(3) Henbane (4) Marigold

111. Match the following columns and select the **correct** option.

	Column I		Column II
a.	Micropyle	(i)	Junction between ovule and funicle
b.	Funicle	(ii)	Stalk of the ovule
c.	Nucellus	(iii)	Passage at the tip of ovule
d.	Hilum	(iv)	Forms body of ovule

(1) a(iv), b(ii), c(i), d(iii) (2) a(iii), b(iv), c(i), d(ii)
(3) a(iii), b(ii), c(iv), d(i) (4) a(iv), b(iii), c(i), d(ii)

112. Which of the following does **not** occur in plants that produce seeds covered with fruit wall?
(1) Embryogeny
(2) Double fertilization
(3) Megasporogenesis
(4) Photosynthesis in gametophyte

113. Test cross is **not** required to know the genotype for the particular character that show
a. Complete dominance
b. Incomplete dominance
c. Co-dominance
The **correct** one(s) is/are
(1) Both b and c (2) Only c
(3) Both a and b (4) Only b

114. Identify the following statements as **true(T)** or **false(F)** and choose the option accordingly.
A. Genetic maps are used in the sequencing of whole genome.
B. The recombination frequency of genes is independent of the distance between genes.
C. Number of chromosomes per somatic cell in male grasshopper is same as in female grasshopper.
D. In honey bees, male and female individuals have different ploidies of their somatic cells.

	A	B	C	D
(1)	T	F	F	T
(2)	T	F	T	T
(3)	F	T	F	T
(4)	F	T	F	F

115. DNA being more stable is preferred as genetic material. This stability is due to all of the following features, **except**
(1) Lack of free 2′ OH
(2) Slow mutation rate
(3) Presence of 5-methyl uracil at the place of uracil
(4) Presence of heterocyclic purines

116. Which additional enzyme is required for the replication of DNA on the template strand with polarity $5' \rightarrow 3'$?
(1) Topoisomerase (2) DNA ligase
(3) Helicase (4) Primase

117. In plants, the living component in the dead cell wall is
(1) Middle lamella (2) Plasmodesmata
(3) Microtubule (4) Axoneme

118. Select the **incorrect** match from the following.
(1) Rough endoplasmic reticulum – Site for protein synthesis
(2) Golgi apparatus – Formation of glycoproteins
(3) Lysosome – Has alkaline condition inside it
(4) Chloroplast – Semiautonomous organelle

119. Which step in the cell cycle marks the beginning of the metaphase?
(1) Congression of chromosomes
(2) Disintegration of nuclear envelope
(3) Attachment of spindle fibres to the kinetochore
(4) Splitting of centromere

120. One of the differences between prophase I of meiosis and prophase of mitosis is that, in the former
(1) Pairing of homologous chromosomes occurs
(2) Condensation of chromatin fibres occurs
(3) Nucleolus disappears
(4) Nuclear envelope benigs to disintegrate

121. Which of the following taxonomical aids is generally analytical in nature?
(1) Key (2) Flora
(3) Herbarium (4) Manual

122. In which of the following kingdoms of Whittaker classification system, members are mostly holozoic?
(1) Protista (2) Fungi
(3) Monera (4) Animalia

123. White rust in *Brassica* is caused by a member of class
(1) Basidiomycetes (2) Phycomycetes
(3) Deuteromycetes (4) Ascomycetes

124. Identify the element on the basis of following information.
- Absorbed by plants in the form of divalent.
- Involved in the synthesis of DNA and RNA.
- Helps in maintaining ribosome structure.

(1) Manganese (2) Phosphorus
(3) Magnesium (4) Calcium

125. The enzyme nitrogenase for the fixing of atmospheric nitrogen in leguminous plants is synthesized by
(1) Root hairs
(2) Cells of pericycle
(3) Cells of cortex
(4) *Rhizobium*

126. Select the statement which is **not** true w.r.t. non-cyclic photophosphorylation.
(1) This process requires an external electron donor
(2) It occurs mostly in stroma lamellae membrane
(3) It is connected with photolysis of water
(4) It produces both ATP and NADPH

127. Who for the first time demonstrated that during photosynthesis, oxygen evolved by green plants comes from H_2O?
(1) Cornelius van Niel (2) T.W. Engelmann
(3) Joseph Priestley (4) Jan Ingenhousz

128. Regarding photorespiration, which of the following statements is **not** true?
(1) It involves three organelles all of which are included in endomembrane system
(2) It involves loss of fixed carbon as CO_2
(3) It does not produce ATP
(4) No net gain of NADPH in this process

129. How many ATP are formed through substrate level phosphorylation from one molecule of glucose when it is completely oxidised?
(1) Two (2) Thirty six
(3) Six (4) Thirty eight

130. If a glucose molecule is undergone alcoholic fermentation, there is no net production of
(1) ATP (2) $NADH + H^+$
(3) CO_2 (4) C_2H_5OH

131. In ETS of mitochondria, the mobile electron carrier that transfers the electrons from complex III to complex IV is
(1) Cytochrome bc_1 (2) Cytochrome a
(3) Cytochrome a_3 (4) Cytochrome c

132. Cells of which of the following tissues are **not** said to be redifferentiated?
(1) Cork (2) Phellogen
(3) Secondary xylem (4) Phelloderm

133. Regarding dormancy of seeds, the phytohormones that show antagonistic effect are
(1) Cytokinin and gibberellin
(2) Auxin and cytokinin
(3) Gibberellin and abscisic acid
(4) Ethylene and gibberellin

134. For the development of new varieties of crop in plant breeding programme, emasculation is essential if the
(1) Female parent plant bears unisexual flowers
(2) Male parent plant bears bisexual flowers
(3) Male parent plant bears unisexual flowers
(4) Female parent plant bears bisexual flowers

135. Select the **incorrect** match from the following.
(1) Ratna – Semi-dwarf variety of rice
(2) Protina – Lysine-rich variety of wheat
(3) Sonora-64 – Mexican wheat variety
(4) Pusa Swarnim – White rust resistant variety of *Brassica*

SECTION-B

136. Match the following columns and select the **correct** option.

	Column-I		**Column-II**
a.	*Trichoderma*	(i)	Pathogen that attacks insects
b.	*Nucleopolyhedro-virus*	(ii)	Controls aphids
c.	Ladybird	(iii)	Control mosquitoes
d.	Dragonflies	(iv)	Common in root ecosystem

(1) a(iv), b(ii), c(iii), d(i) (2) a(iv), b(i), c(ii), d(iii)
(3) a(i), b(iii), c(iv), d(ii) (4) a(i), b(iv), c(iii), d(ii)

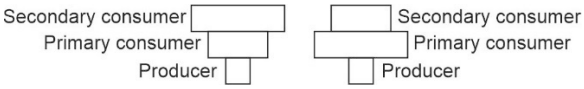
137. Statins and cyclosporin A are produced by the
(1) Fungi belong to different classes
(2) A fungus and a bacterium respectively
(3) Two different fungi of same class
(4) A bacterium and a fungus respectively

138. Mean annual rainfall is maximum for which of the following biomes?
(1) Tropical rainforest
(2) Alpine tundra
(3) Temperate forest
(4) Grassland

139. Select the **wrong** statement w.r.t. stenothermal.
(1) These organisms live in areas where the temperature is uniform throughout the year
(2) These organisms are restricted to narrow range of temperature
(3) Only cold-blooded animals belong to this category
(4) Few mammals such as polar bears are stenothermal

140. What amount of energy in the form of food will be transferred from second trophic level to third trophic level in a food chain if 9000 J energy of sunlight is converted into food by the producer?
(1) 90 J (2) 900 J
(3) 9 J (4) 0.9 J

141. Which ecological pyramid(s) can be represented as shown below?



(1) Pyramid of productivity
(2) Pyramid of energy and biomass
(3) Pyramid of number
(4) Pyramid of energy and number

142. Regarding global biodiversity, which amongst the following groups of organisms has maximum number of species?
(1) Fungi (2) Fishes
(3) Birds (4) Reptiles

143. All of the following are alien species in India that have harmful impact on Indian ecosystem, **except**
(1) *Parthenium* (2) *Lantana*
(3) African catfish (4) Nile perch

144. Eutrophication in water bodies is particularly due to their enrichment with
(1) Iron and sulphur
(2) Nitrogen and phosphorus
(3) DDT and Hg
(4) Calcium and magnesium

145. Which of the following is **not** due to UV-B radiation?
(1) Aging of skin (2) Global warming
(3) Snow-blindness (4) Skin cancer

146. Which representation regarding the floral formula of *Brassica* is **correct**?
(1) K_{4+2} (2) A_{2+4}
(3) $\underline{G}_2$ (4) $C_{1+2+(2)}$

147. All of the following disorders can be inherited in the offsprings, **except**
(1) Sickle cell anaemia
(2) Colour-blindness
(3) Down's syndrome
(4) Thalassemia

148. Wheat and Brinjal are placed in the same
(1) Division (2) Class
(3) Family (4) Order

149. Which plants flower when provided photoperiods longer than critical period?
(1) Only long day plants
(2) Only short day plants
(3) Both long day and short day plants
(4) Both long day and day neutral plants

150. The anticodon in tRNA that carries amino acid methionine to mRNA is
(1) 3′ CAU 5′
(2) 3′ UAC 5′
(3) 3′ AUG 5′
(4) 3′ GUA 5′

ZOOLOGY

SECTION-A

151. Which of the following characteristic features holds true for the corresponding group of animals?
(1) Air bladder is present – Chondrichthyes
(2) External fertilisation – Osteichthyes
(3) True placenta is present – Reptiles
(4) External ear openings are present – Reptilia

152. Select the **correct** set of animals which possess metanephric kidney.
(1) *Pavo*, *Hyla* (2) *Chelone*, *Scoliodon*
(3) *Neophron*, *Canis* (4) *Naja*, *Betta*

153. Presence of water vascular system is a characteristic feature of
(1) *Antedon* (2) *Chiton*
(3) *Aedes* (4) *Pinctada*

154. Basophil cells do not produce
(1) Histamine
(2) Heparin
(3) Serotonin
(4) Erythropoietin

155. Joint diastole ends with the beginning of
(1) Atrial systole (2) Atrial diastole
(3) Ventricular systole (4) Ventricular diastole

156. A person having only anti-B antibodies in his plasma, can donate blood to people with blood groups
(1) A and AB (2) Only B
(3) O and B (4) O and A

157. Intercalated discs are present in
(1) Smooth muscles
(2) Striated voluntary muscles
(3) Skeletal muscles
(4) Cardiac muscles

158. Read the following statements and choose the **correct** answer.
A. Cellulose is a branched structural polysaccharide.
B. GLUT-4 is a heteropolymer.
C. Zinc ions are required for catalytic activity of salivary amylase.
(1) Only A is correct
(2) Only C is correct
(3) Only B is correct
(4) A and B are correct

159. Choose the **odd** one w.r.t. structures associated with mucosa of wall of alimentary canal
(1) Goblet cells
(2) Villi in small intestine
(3) Rugae in stomach
(4) Brunner's gland

160. Match column-I with column-II and choose the **correct** answer

	Column-I (Enzyme)		Column-II (Action/source)
a.	Amylase	(i)	Acts on starch
b.	Nucleotidase	(ii)	Secreted from gastric gland
c.	Rennin	(iii)	Acts on glycerides
d.	Steapsin	(iv)	Secreted from intestinal glands

(1) a(i), b(ii), c(iii), d(iv) (2) a(i), b(iii), c(ii), d(iv)

(3) a(i), b(iv), c(ii), d(iii) (4) a(ii), b(i), c(iii), d(iv)

161. The partial pressure of CO_2 and O_2 in deoxygenated blood is

(1) 40 and 45 mm Hg respectively

(2) 95 and 40 mm Hg respectively

(3) 45 and 40 mm Hg respectively

(4) 40 and 95 mm Hg respectively

162. The myelin sheath present on the tracts forming the corpus callosum is secreted by

(1) Schwann cells (2) Oligodendrocytes

(3) Astrocytes (4) Microglial cells

163. Which of the following is the correct pathway of transmission of vibrations from eardrum?

(1) Middle ear → Round window → Scala media → Oval window → Scala vestibuli

(2) Ear ossicles → Round window → Scala vestibuli → Scala tympani → Oval window

(3) Ear ossicles → Round window → Scala vestibuli → Scala media → Scala tympani

(4) Middle ear → Oval window → Scala vestibuli → Scala media → Scala tympani → Round window

164.. Which of the following hormones will be detected in a sample of blood taken from hypophyseal portal vein?

(1) GnRH, GH, TSH

(2) GnRH, somatostatin, TRH

(3) GnRH, FSH, TRH

(4) FSH, prolactin, GnRH

165. Generation of secondary messengers is associated with the mechanism of action of

(1) Estrogen and ACTH

(2) Insulin and TSH

(3) Cortisol and ACTH

(4) Progesterone and androgens

166. Which of the following pair is **incorrect**?

(1) cDNA – DNA formed by reverse transcription on RNA template

(2) Interferon – An enzyme that interferes with DNA replication

(3) Plasmid – Present in both prokaryotes and some eukaryotes

(4) DNA ligase – Helps in formation of rDNA

167. If a MNC uses bio-resources of one country without its proper authorisation, it is called

(1) Bioethics (2) Biopiracy

(3) Biosafety (4) Biomanipulation

168. To clone a gene of interest by PCR, we require

a. Primers b. dATP

c. dUTP d. *Taq* polymerase

e. ATP

Select the **correct** answer

(1) a, b, c, d (2) b, c, d, e

(3) Only a and d (4) Only a, b and d

169. Select the **correct** statement w.r.t. golden rice

(1) It is a bioindicator that indicates that gold is present in underlying rock

(2) A GM crop that is grown to tolerate both herbicide and pest resistance

(3) A hybrid variety developed by crossing basmati with a dwarf Mexican variety

(4) A GM crop prepared by introducing β-carotene gene into *Oryza sativa* by *Agrobacterium*

170. Choose the **correct** palindromic sequence for restriction endonuclease *BamH* I

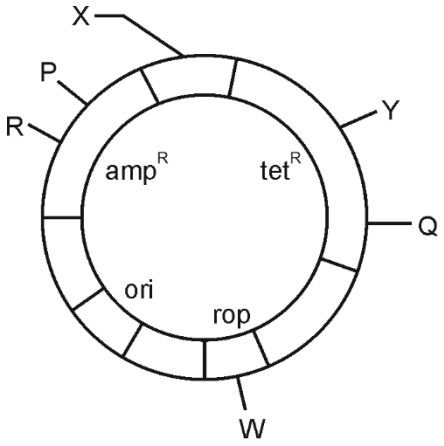
(1) 5′-GAATTC-3′
3′-CTTAAG-5′

(2) 5′-GGATCC-3′
3′-CCTAGG-5′

(3) 5′-AAGCTT-3′
3′-TTCGAA-5′

(4) 5′-CCCGGG-3′
3′-CGGCCC-5′

171. Carefully study the given picture of cloning vector pBR322 and choose the option that correctly points the recognition site for restriction enzyme *Eco* RI.



(1) X (2) Y
(3) P (4) Q

172. The joint which is present between radius and ulna is also present between
(1) Tibia and Fibula
(2) Atlas and axis
(3) Carpal and metacarpal of thumb
(4) Carpals

173. Total number of girdle bones are equal to
(1) Number of facial bones
(2) Number of ear ossicles
(3) Number of cranial bones
(4) Number of limb bones

174. In a sarcomere, only _____ filaments are present in H zone
Choose the option that **correctly** fills the blank.
(1) Actin (2) Myosin
(3) Troponin (4) Tropomyosin

175. Which of the following is obtained from *Cannabis sativa*?
(1) Opium (2) Charas
(3) Morphine (4) Crack

176. Among the following terms, how many are related to physiological barrier of innate immunity?

Skin, Tears, Interferons, Monocyte, saliva, mucus coating

(1) One (2) Two
(3) Four (4) Three

177. Choose the **mismatch** w.r.t. disease and vector
(1) Dengue – *Culex*
(2) Malaria – *Anopheles*
(3) Chikungunya – *Aedes*
(4) Filariasis – *Culex*

178. Koala, Banded anteater and Tasmanian tiger cat represents example of
(1) Analogous organ
(2) Convergent evolution
(3) Adaptive radiation
(4) Adaptive convergence

179. Mammals directly evolved from
(1) Thecodonts (2) Therapsids
(3) Dinosaurs (4) Sauropsids

180. Complete the analogy w.r.t. cranial capacity of hominids.
Homo habilis : 750 cc : : *Homo erectus* : _____
(1) 650 (2) 900
(3) 1450 (4) 1600

181. In the year 1947, India's population was A and crossed B in May 2011.
Choose the option that **correctly** fills the blank (A) and (B).

	A	**B**
(1)	350 million	35 billion
(2)	35 million	1.2 billion
(3)	350 million	1.2 billion
(4)	35 million	35 billion

182. How many among the following, prevents implantation as well as ovulation?

Multiload 375, Mala-D, Norplant, Saheli

(1) One (2) Four
(3) Two (4) Three

183. In human embryonic development first movement of foetus and appearance of hair on head are observed by the end of
(1) First month
(2) Second month
(3) First trimester
(4) Fifth month

184. During oogenesis, a glycoprotein layer called zona pellucida is formed by
(1) Primary oocyte
(2) Theca cells
(3) Secondary oocyte
(4) Medullary stroma of ovary

185. In male reproductive system, the ejaculatory ducts open into
(1) Penile urethra
(2) Membranous urethra
(3) Prostatic urethra
(4) Corpus spongiosum

SECTION-B

186. During menstrual cycle, gonadotropins level attain peak at the
(1) End of menstrual phase
(2) End of follicular phase
(3) Mid of luteal phase
(4) Beginning of follicular phase

187. Number of chromosomes in meiocyte of a rat is
(1) 46 (2) 42
(3) 23 (4) 21

188. All of the following are associated with test tube baby programme **except**
(1) In vitro fertilisation
(2) ZIFT
(3) IUI
(4) ET

189. In an animal breeding programme, if someone wants to eliminate harmful recessive genes within a breed, then one must
(1) Evolve a pureline of the animal by inbreeding, so that recessive harmful genes are exposed and thus eliminate such animals by selection
(2) Select superior male and superior female of different breed for mating
(3) Allow random mating in the farm
(4) Select superior male and superior female of different species

190. In a healthy human, the net filtration pressure for glomerular filtration is
(1) 20 mmHg (2) 10 mmHg
(3) 30 mmHg (4) 60 mmHg

191. All of the following functions are attributed to ADH **except**
A. Increase in glomerular blood flow
B. Promoting diuresis
C. Decrease in blood pressure
D. Increase in body fluid volume
(1) A and B (2) C and D
(3) B and C (4) A and D

192. Time duration from opening of AV valves to closing of semilunar valves is
(1) 0.1 s (2) 0.3 s
(3) 0.5 s (4) 0.8 s

193. Protonephridia is an excretory organ of
(1) Echinoderms
(2) Arthropods
(3) Molluscs
(4) Cephalochordates

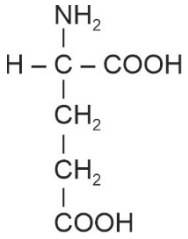
194. Addison's disease is associated with
(1) Hypothyroidism (2) Adrenal cortex
(3) Pancreas (4) Pineal gland

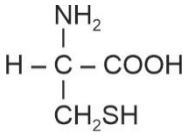
195. How many molar teeth are present in each jaw of an adult human?
(1) 3 (2) 2
(3) 6 (4) 12

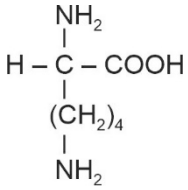
196. Triploblastic, metamerically segmented, dioecious and coelomate animals are
(1) *Apis, Hirudinaria*
(2) *Nereis, Locusta*
(3) *Pheretima, Periplaneta*
(4) *Nereis, Pila*

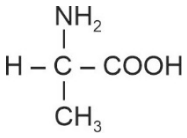
197. The partial pressure of oxygen and carbon dioxide in blood of superior vena cava are respectively
(1) 104, 40 mmHg
(2) 40, 45 mmHg
(3) 95, 40 mmHg
(4) 45, 40 mmHg

198. Which one out of A-D given below shows the structure of a basic amino acid?

A. 

B. 

C. 

D. 

(1) A (2) B

(3) C (4) D

199. The digestion of diglycerides mainly occurs in

(1) Buccal cavity

(2) Stomach

(3) Small intestine

(4) Large intestine

200. Which of the following is a primary lymphoid organ?

(1) Bone marrow

(2) Spleen

(3) Payer's patches

(4) MALT

❑ ❑ ❑