

# NEW STANDARD ACADEMY

Date : 18-08-25

CLASS : 12<sup>TH</sup> NEET

Marks: 720  
Time: 3 hours.

## (PHYSICS)

- Coherence is a measure of
  - capability of producing interference by waves
  - waves being diffracted
  - waves being reflected
  - waves being refracted
- Two independent monochromatic sodium lamps cannot produce interference because
  - the frequencies of two sources are different
  - the phase difference between two sources changes with respect to time
  - the two sources become coherent
  - the amplitudes of two sources are different
- Coherent sources can be obtained
  - only by division of wavefront
  - only by division of amplitude
  - both by division of amplitude and wavefront
  - none of these
- In light waves emitted by an ordinary source, for what period of time, the phase remains constant?
  - 10 s
  - 1 s
  - $10^{-3}$  s
  - $10^{-8}$  s
- To observe a stationary interference pattern formed by two light waves, it is not necessary that they must have
  - the same frequency
  - the same amplitude
  - a constant phase difference
  - coherent sources
- The energy in the phenomenon of interference
  - is conserved and gets redistributed
  - is equal at every point
  - is destroyed in regions of dark fringes
  - is created at the place of bright fringes
- The resultant amplitude in interference with two coherent sources depends
  - only upon amplitude
  - only upon phase difference
  - on both the above
  - none of the above
- Phenomenon of interference is observed
  - only for light waves
  - only for sound waves
  - for both sound and light waves
  - none of above
- The phenomenon of interference in light was studied first by
  - Newton
  - Young
  - Fresnel
  - Huygen
- Which of following nature of light waves is supported by the phenomenon of interference?
  - Longitudinal
  - Transverse
  - Both transverse and longitudinal
  - None of the above
- For distinct interference pattern to be observed, necessary condition is that ratio of intensity of light emission by both the sources should be
  - 2:1
  - 1:2
  - 1:1
  - 1:4
- The phase difference corresponding to path difference of  $x$ 
  - $(2\pi x)/\lambda$
  - $(2\lambda)/x$
  - $(\pi x)/\lambda$
  - $\lambda/x$
- If intensity of each of the two waves is  $I$  and they are having phase difference of  $120^\circ$ , when the waves are superposed, then the resultant intensity will be
  - $I$
  - $2I$
  - $I/2$
  - $4I$
- Two monochromatic light waves of amplitudes  $A$  and  $2A$  interfering at a point, have a phase difference of  $60^\circ$ . The intensity at that point will be proportional to

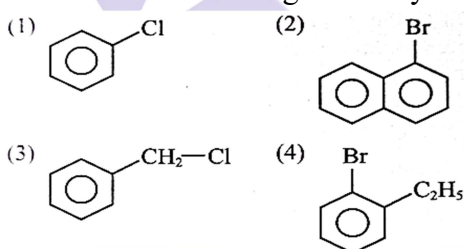
- (a)  $3A^2$  (b)  $5A^2$   
(c)  $7A^2$  (d)  $9A^2$
15. If ratio of amplitude of two interfering source is 3 : 5, then ratio of intensity of maxima and minima in interference pattern will be  
(a) 25:16 (b) 5:3  
(c) 16:1 (d) 25:9
16. Two coherent sources of different intensities send waves which interfere. The ratio of maximum intensity to the minimum intensity is 25. The intensities of the sources are in the ratio  
(a) 25:1 (b) 5:1  
(c) 9:4 (d) 625:1
17. Three coherent waves having amplitudes 12 mm, 6 mm and 4 mm arrive at a given point with successive phase difference of  $\pi/2$ . Then the amplitude of the resultant wave is  
(a) 7 mm (b) 10 mm  
(c) 5 mm (d) 4.8 mm
18. The light waves from two independent monochromatic light sources are given by  $y_1 = 2 \sin \omega t$  and  $y_2 = 3 \cos \omega t$ . Then which of the following statements is correct?  
(a) Both the waves are coherent.  
(b) Both the waves are incoherent.  
(c) Both the waves have different time periods.  
(d) None of the above
19. Two coherent waves are represented by  $y_1 = a_1 \cos \omega t$  and  $y_2 = a_2 \sin \omega t$ . The resultant intensity due to interference will be  
(a)  $a_1 + a_2$  (b)  $a_1 - a_2$   
(c)  $a_1^2 + a_2^2$  (d)  $a_1^2 - a_2^2$
20. If the ratio of maximum and minimum intensities in an interference pattern is 36:1, then the ratio of amplitudes of two interfering waves will be  
(a) 6:1 (b) 7:4  
(c) 37:36 (d) 7:5
21. Interference produced due to two identical coherent monochromatic sources results in central bright fringe with intensity I. If one of the source is removed, intensity becomes I'. The relation between I and I' is  
(a)  $I = 2I'$  (b)  $I = 3I'$   
(c)  $I = (I')/2$  (d)  $I = 4I'$
22. Two coherent sources of equal intensities produce a maximum of 100 units. If the amplitude of one of the sources is reduced by 20%, then the maximum intensity produced will be  
(a) 100 (b) 81  
(c) 89 (d) 60
23. Distance between the sources is one metre. An observer observes minimum intensity at some point on line joining the sources, then the wavelength of the wave should be  
(a) 1 m (b) 2 m  
(c) 0.5 m (d) 0.25 m
24. The intensity of two waves from two independent sources is 2 and 3 unit, then average intensity of the light in the overlapping region will have the value  
(a) 2.5 (b) 6  
(c) 5 (d) 13
25. The two coherent sources of equal intensity produce maximum intensity of 100 units at a point. If the intensity of one of the sources is reduced by 36% by reducing its width, then the intensity of light at the same point will be  
(a) 90 (b) 89  
(c) 67 (d) 81
26. In Young's double slit experiment, distance between two sources is 0.1 mm. The distance of screen from the sources is 20 cm. Wavelength of light used is  $5460 \text{ \AA}$ . Then angular position of first dark fringe is approximately  
(a)  $0.08^\circ$  (b) 0.16  
(c)  $0.20^\circ$  (d) 0.32
27. In Young's double slit experiment, the slits are 0.5 mm apart and interference is observed on a screen placed at a distance of 100 cm from the slits. It is found that the 9th bright fringe is at a distance of 9.0 mm from the second dark fringe from the centre of the fringe pattern. What is the wavelength of light used?  
(a)  $2000 \text{ \AA}$  (b)  $4000 \text{ \AA}$   
(c)  $6000 \text{ \AA}$  (d)  $8000 \text{ \AA}$

28. The Young's double slit experiment is performed with blue and with green light of wavelengths  $4360\text{\AA}$  and  $5460\text{\AA}$ , respectively. If  $X$  is the distance of the 4th maxima from the central one, then
- $X_{(\text{blue})} = X_{(\text{green})}$
  - $X_{(\text{blue})} > X_{(\text{green})}$
  - $X_{(\text{blue})} < X_{(\text{green})}$
  - $X_{(\text{blue})} / X_{(\text{green})} = 5460/4360$
29. In Young's experiment with yellow light ( $\lambda = 5800\text{\AA}$ ), 70 fringes are observed in a given region. If violet light ( $\lambda = 4358\text{\AA}$ ) is used, then fringes formed in same region will be
- 73
  - 93
  - 33
  - 53
30. In Young's double slit experiment using light of wavelength  $600\text{ nm}$ , the angular width of a fringe formed on a distant screen is  $0.1^\circ$ . What is the spacing between the two slits?
- $3.44 \times 10^{-4}\text{ m}$
  - $3.44 \times 10^{-4}\text{ m}$
  - $2.44 \times 10^{-4}\text{ m}$
  - $2.44 \times 10^{-4}\text{ m}$
31. In a two slit experiment with monochromatic light, fringes are obtained on a screen placed at some distance from the slits. If screen is moved by  $5 \times 10^{-2}\text{ m}$  towards the slits, then change in fringe width is  $3 \times 10^{-5}\text{ m}$ . If the distance between slits is  $10^{-3}\text{ m}$ , then wavelength of the light used will be
- $4000\text{\AA}$
  - $6000\text{\AA}$
  - $5890\text{\AA}$
  - $8000\text{\AA}$
32. In Young's double slit experiment,  $d/D = 10^{-4}$  ( $d$  = distance between slits,  $D$  = distance of screen the slits). At a point  $P$  on the screen, resulting intensity is equal to the intensity due to individual slit  $I_0$ . Then the distance of point  $P$  from the central maximum is ( $\lambda = 6000\text{\AA}$ )
- $2\text{ mm}$
  - $1\text{ mm}$
  - $0.5\text{ mm}$
  - $4\text{ mm}$
33. In Young's double slit experiment distance between source is  $1\text{ mm}$  and distance between the screen and source is  $1\text{ m}$ . If the fringe width on the screen is  $0.06\text{ cm}$ , then  $\lambda$  is
- $6000\text{\AA}$
  - $4000\text{\AA}$
  - $1200\text{\AA}$
  - $2400\text{\AA}$
34. In a Young's double-slit experiment, the intensity of the central maximum is  $I_0$ . The width of one slit is now doubled. The intensity at the point where the intensity was originally  $I_0$  will now be  $I_0$
- $0.75I_0$
  - $I_0$
  - $1.5I_0$
  - None of these
35. Young's double slit experiment is made in a liquid. The 10th bright fringe in liquid lies where 6th dark fringe lies in vacuum. The refractive index of the liquid is approximately
- 1.8
  - 1.54
  - 1.67
  - 1.2
36. In an interference pattern, the  $(n + 4)^{\text{th}}$  blue bright fringe and  $n^{\text{th}}$  red bright fringe are formed same spot. If red and blue light have the wavelength of  $7800\text{\AA}$  and  $5200\text{\AA}$ , then value of  $n$  should be
- 2
  - 4
  - 6
  - 8
37. In Young's double slit experiment, the two slits act as coherent sources of equal amplitude  $A$  and wavelength  $\lambda$ . In another experiment, with the same set up, the two slits are sources of equal amplitude  $A$  and wavelength  $\lambda$  but are incoherent. The ratio of the intensity of light at the mid-point of the screen in the first case to that in the second case is
- 4:1
  - 2:1
  - 1:1
  - none of the above
38. A particle moves with a constant speed but in constantly varying direction. The path of the particle will be
- Elliptical
  - Linear
  - Circular
  - Parabolic
39. Relation between initial velocity, final velocity and acceleration is
- $v = u - as$
  - $v = u + as$
  - $v^2 - u^2 = as$
  - $u^2 - v^2 = -2as$
40. A ball thrown vertically upwards returns to the point of projection in  $6\text{ s}$ . The velocity of the ball is nearly

- (a)  $72\text{km h}^{-1}$  (b)  $36\text{km h}^{-1}$   
(c)  $108\text{km h}^{-1}$  (d)  $18\text{km h}^{-1}$
41. The velocity of a body under the influence of uniform acceleration becomes zero in one hour. The corresponding distance covered is 39 m. The distance covered by the body in next one hour will be  
(a) 39 m (b) 78 m  
(c) 12 m (d) zero.
42. A train 100 long and is moving with uniform velocity of  $45\text{ km h}^{-1}$  taken by it to cross a bridge of 1 km length is  
(a) 10 s (b) 20 s  
(c) 44 s (d) 88 s.
43. The equation of motion for the freely dropped body under gravity is  
(a)  $v^2 = -2aS$  (b)  $v^2 = 2gS$   
(c)  $v^2 = -2gS$  (d)  $v^2 = 2aS$
44. Acceleration of a body moving with constant speed in a circle is  
(a) zero (b)  $r\omega$   
(c)  $\omega^2 / r$  (d)  $r\omega^2$
45. A body can't have  
(a) a constant speed and varying velocity  
(b) an acceleration and a constant speed  
(c) a constant velocity and varying speed  
(d) non zero speed and zero acceleration.

### CHEMISTRY

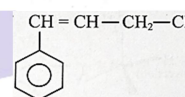
46. Which of the following is not aryl halide?



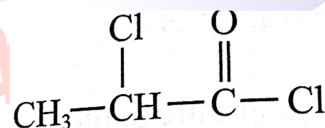
47. Trimethylene dichloride is  
(a) Alkyl halide (b) Geminal dihalide  
(c) Vicinal dihalide (d) Polymethylene dihalide
48. Allyl chloride is  
(a) Monohalogen derivative (b) Dihalogen derivative  
(c) Trihalogen derivative (d) Tetrahalogen derivative
49. In benzyl chloride, halogen bearing carbon is linked to hybridized carbon.  
(a)  $sp^3$  (b)  $sp^2$   
(c)  $sp$  (d)  $sp^3d$

50. Isopropyl chloride is classified as  
(a) Primary alkyl halide  
(b) Iso alkyl halide  
(c) Secondary alkyl halide  
(d) Tertiary alkyl halide
51. How many secondary alkyl chloride are possible from n-pentane?  
(a) 1 (b) 2  
(c) 3 (d) 4
52. Molecular structure of Crotyl bromide is  
(1)  $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_2 - \text{Br}$   
(2)  $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH} - \text{Br}$   
(3)  $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{Br}$   
(4)  $\text{CH}_3 - \text{CH} = \underset{\text{Br}}{\text{C}} - \text{CH}_3$

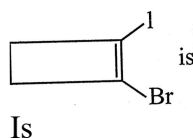
53. IUPAC nomenclature of is



- (a) 3-Chloro-1-phenylpropene  
(b) Cinnamyl chloride  
(c) Benzylic chloride  
(d) Phenyl allyl chloride
54. IUPAC nomenclature of  
 $\text{CH}_2 = \underset{\text{C}_2\text{H}_5}{\text{CH}} = \underset{\text{Cl}}{\text{CH}} - \text{C} = \text{CH}_2$   
(a) 4-Chloro-3-ethylpenta-1, 4-diene  
(b) 2-Chloro-3-ethylpenta-1, 4-diene  
(c) 2-Chloro-3-ethylpenta-1, 3-diene  
(d) 4-Chloro-3-ethylpenta-1, 3-diene
55. IUPAC name of  $(\text{CH}_3)_2\text{CH} - \text{CH}_2 - \text{CH}_2 - \text{Br}$  is  
(a) 1-Bromopentane  
(b) 2-Methyl-4-bromopentane  
(c) 1-Bromo-3-methylbutane  
(d) 2-Methyl-3-bromopropane
56. Choose the correct name of the compound.



- (a) Chloroformyl chloroethane  
(b) 1, 2-Dichloropropanal  
(c) 1, 2-Dichloropropanone  
(d) 2-Chloropropanoyl chloride
57. Correct IUPAC name of

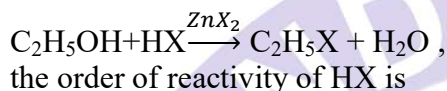


- (a) 1-Bromo-2-iodocyclobut-1-ene
- (b) 1-Iodo-2-bromocyclobut-1-ene
- (c) 1-Bromo-4-iodocyclobut-1-ene
- (d) 1-Bromo-2-iodocyclobut-2-ene

58. Ethyl alcohol on heating with sodium bromide and conc.  $\text{H}_2\text{SO}_4$  produces

- (a) Bromoethane
- (b) Ethylene
- (c) Ethylene dibromide
- (d) Ethane

59. In reaction



- (a)  $\text{HBr} > \text{HI} > \text{HCl}$
- (b)  $\text{HI} > \text{HCl} > \text{HBr}$
- (c)  $\text{HCl} > \text{HBr} > \text{HI}$
- (d)  $\text{HI} > \text{HBr} > \text{HCl}$

60. Which of the following leads to the formation of an alkyl halide?

- (a)  $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Red P} + \text{Br}_2}$
- (b)  $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{SOCl}_2}$
- (c)  $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{KBr} + \text{Conc. H}_2\text{SO}_4}$
- (d) All of the above

61. During the iodination of alkanes using  $\text{HgO}$ , it is reduced to

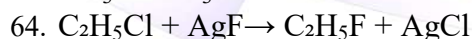
- (a)  $\text{R} - \text{H}$
- (2)  $\text{H}_2\text{O}$
- (c)  $\text{HgI}_2$
- (4) Iodine

62. Wrong statement about halogenation of alkanes is

- (1) Chlorination is free radical substitution reaction
- (2) Chlorination and bromination are not stopped at monohalogenation step
- (3) n-Butane on chlorination form isobutyl chloride
- (4) Iodination is stopped at monoiodo step

63. In Finkelstein reaction, which of the following reactants are used?

- (a)  $\text{NaI} + \text{C}_2\text{H}_5\text{OH}$
- (b)  $\text{NaCl} + \text{acetone}$
- (c)  $\text{NaBr} + \text{CH}_3\text{COCH}_3$
- (d)  $\text{NaI} + \text{CH}_3\text{COCH}_3$



The above reaction is called

- (a) Hunsdiecker
- (b) Swart
- (c) Strecker
- (d) Wurtz

65. Wrong statement about the physical properties of alkyl halides is

- (a) Boiling points of alkyl halides are higher than parent alkanes

- (b) Bromo, iodo and polychloro derivatives of hydrocarbons are heavier than water
- (c) Methyl chloride, methyl bromide and chlorofluoro methanes are liquids at room temperature
- (d) As the branching in isomeric alkyl halides increases their boiling points also increase

**READ THE STATEMENTS CAREFULLY TO MARK THE CORRECT OPTION OUT OF THE OPTIONS GIVEN BELOW**

- (a) If both statements are true and Reason is the correct explanation of Assertion.
- (b) If both statements are true but Reason is not the correct explanation of Assertion.
- (c) If Assertion is true but Reason is false.
- (d) If Assertion is false but Reason is true.

66. **Assertion:** Aryl halides are less reactive than alkyl halide-Towards NSR

**Reason:** Intermediate carbocation obtained from aryl halide is less stable.

67. **Assertion:** Alkyl halides are not soluble in water.

**Reason:** Alkyl halides do not form H-bonds with water molecule although alkyl halide is polar in nature.

68. **Assertion:**  $\text{CHCl}_3$  is more acidic than  $\text{CHF}_3$

**Reason:** Electronegativity of fluorine is more than chlorine.

69. **Assertion:** Styrene on reaction with HBr gives 1-bromo-1-phenyl-ethane.

**Reason:** Benzyl radical is more stable than alkyl radical.

70. **Assertion:** The reaction of vinyl chloride and hydroiodic acid produces 1-chloro-1-iodoethane

**Reason:** HI adds on vinyl chloride against Markownikoff's rule

71. **Assertion:** Potassium ferrocyanide is diamagnetic whereas potassium ferricyanide is paramagnetic.

**Reason:** Crystal field splitting in ferrocyanide ion is greater than that of ferricyanide ion.

72. **Assertion:**  $[\text{Ni}(\text{CN})_4]^{2-}$  has zero unpaired electron while that of  $[\text{NiCl}_4]^{2-}$  has two unpaired  $e^-$

**Reason:**  $[\text{Ni}(\text{CN})_4]^{2-}$  has strong crystal field while  $[\text{NiCl}_4]^{2-}$  has weak crystal field

73. **Assertion:**  $[\text{Co}(\text{NO}_2)_3(\text{NH}_3)_3]$  does not show optical isomerism.

**Reason:** It has plane of symmetry.

74. **Assertion:** C-C bond length in Zeise's salt is same as ethylene.

**Reason:** Single bond is shorter as compared to double bond.

75. **Assertion:** Hydrazine is a neutral ligand.

**Reason:** It has two N as donor atoms and behaves as a chelating ligand.

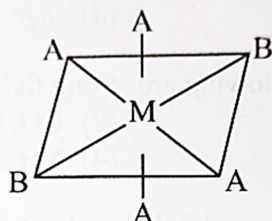
76. Which of the following complexes cannot exhibit geometrical isomerism?

- (a)  $[\text{Pt}(\text{NH}_3)_2(\text{Cl})(\text{NO}_2)]$  (b)  $[\text{Pt}(\text{gly})_2]$   
(c)  $[\text{Cu}(\text{en})_2]^{+2}$  (d)  $[\text{Pt}(\text{H}_2\text{O})(\text{NH}_3)(\text{Br})(\text{Cl})]$

77. Out of the following, which complex will show geometrical isomerism?

- (a)  $[\text{Pt}(\text{NH}_3)_2(\text{Cl})_2]$  (b)  $[\text{Ni}(\text{CO})_4]$   
(c)  $[\text{Na}_3[\text{Ni}(\text{CN})_4]]$  (d)  $[\text{K}[\text{Ag}(\text{CN})_2]]$

78. The isomer can be marked as



- (a) cis isomer (b) leavo isomer  
(c) dextro isomer (d) trans isomer

79. What is the relationship between the following two linear complex ions?

$[\text{Cl} - \text{Ag} - \text{SCN}]^-$   $[\text{SCN} - \text{Ag} - \text{Cl}]^-$   
The complex ions are

- (a) Linkage isomers (2) Coordination isomers  
(c) Geometric isomers (d) Optical isomers

80.  $[\text{Co}(\text{NH}_3)_4(\text{Cl})_2]\text{NO}_2$  and  $[\text{Co}(\text{NH}_3)_4(\text{Cl})(\text{NO}_2)]\text{Cl}$  are

- (a) Geometrical isomers  
(b) Optical isomers  
(c) Linkage isomers  
(d) Ionisation isomers

81. Complex with  $\text{CN}^-$  ligands are usually

- (a) High spin complexes

(b) Low spin complexes

(c) Both

(d) None of these

82. The number of d-electrons in  $[\text{Cr}(\text{H}_2\text{O})_4]^{3+}$  is

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

83. In octahedral complex, which orbitals experience maximum repulsion

- (a)  $d_{xy}, d_{yz}, d_{zx}$  (b)  $d_{xy}, d_{z^2}$   
(c)  $d_{x^2-y^2}, d_{z^2}$  (d)  $d_{xy}$   
(e)  $d_{x^2-y^2}, d_{z^2}$

84. In tetrahedral complex, which orbitals experience maximum repulsion?

- (a)  $d_{xy}, d_{yz}, d_{zx}$  (b)  $d_{x^2-y^2}, d_{z^2}$   
(c)  $d_{x^2-y^2}, d_{xy}, d_{yz}$  (d)  $d_{yz}, d_{x^2-y^2}, d_{z^2}$

85. Among the following ions, which one has the highest paramagnetism?

- (a)  $[\text{FeF}_6]^{3-}$  (2)  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$   
(c)  $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$  (4)  $[\text{Zn}(\text{H}_2\text{O})_6]^{2+}$

86. In which of the following molecules, central atom used orbitals of different quantum number in the hybridisation?

- (a)  $[\text{Fe}(\text{CO})_5]$  (2)  $\text{IF}_7$   
(3)  $[\text{Ni}(\text{CO})_4]$  (4)  $\text{XeO}_4$

87. The wrong statement is

- (a) Halide ligands form high spin complex  
(b) Strong ligands form low spin complex  
(c)  $[\text{FeF}_6]^{3-}$  is inner orbital complex  
(d)  $[\text{NiCl}_4]^{2-}$  is outer orbital complex

88. Which of the following system has maximum number of unpaired electrons?

- (a)  $d^5$  (Octahedral, low spin)  
(b)  $d^8$  (Tetrahedral)  
(c)  $d^6$  (Octahedral, low spin)  
(d)  $d^3$  (Octahedral)

89. For which of the  $d^n$  configuration, both low and high spin complexes are possible?

- (a)  $d^9$  (b)  $d^7$   
(c)  $d^5$  (d)  $d^2$

90. Magnetic moment of  $(\text{NH}_4)_2[\text{MnBr}_4]$  is \_\_\_\_\_ BM

- (a) 5.91 (b) 4.91  
(c) 3.91 (d) 2.46

## BIOLOGY

91. Find the odd one out of following w.r.t. levels of biological organization:

- (a) Organism                      (b) Landscape  
(c) Population                  (d) Biomes

92. Size of population is:

- (a) Population density  
(b) Number of individuals present per unit area  
(c) Represented by N  
(d) All of the above

93. Rate of natural increase' is:

- (a) r                                  (b) k  
(c) b                                  (d) d

94. Correct equation for exponential growth is:

- (a)  $d/dt(N) = rN$   
(b)  $d/dt(N) = (b - d)N$   
(c)  $N_t = N_0 e^{rt}$   
(d) all of these

95. Carrying capacity in equation  $d/dt = rN$

- $\left[ k - \frac{N}{k} \right]$  is  
(a) r                                  (b) N  
(c) K                                  (d) rN

96. In 1981, the r-value for human population in India was:

- (a) 0.0196                      (b) 0.0205  
(c) 2.71                              (d) 0.175

97. S-shaped growth curve is formed in:

- (a) Logistic growth      (b) Exponential growth  
(c) Both (1) and (2)      (d) Non-realistic growth

Select an incorrect statement:

- (a) Natality refers to the number of births during a given period.  
(b) If a new habitat is just being colonized, emigration may contribute more significantly to population growth than birth rates.  
(c) In 1981, the r value for human population in India was 0.0205.  
(d) Any species growing exponentially under unlimited resource conditions can reach enormous population densities in a short time.

98. The difference between exponential and logistic growth rates is

- (a) Exponential growth depends on birth and death rates and logistic does not.

(b) In logistic growth, emigration and immigration are unimportant.

(c) That both are affected by density, but logistic growth is slower.

(d) That only logistic growth reflects density-dependent effects on births or deaths.

99. The size of the population is represented by its

- (a) Biotic potential      (b) Mortality  
(c) Natality                  (d) Density

100. The loss of individuals due to death in a population under given environmental conditions is termed

- (a) Natality                      (b) Natality rate  
(c) Mortality                      (d) Mortality rate

101. The inherent maximum capacity of an organism to reproduce or increase in number is termed

- (a) Biotic potential (designated by the symbol 'r').  
(b) Biotic potential (designated by the symbol 'd').  
(c) Biotic potential (designated by the symbol 'b').  
(d) Biotic potential (designated by the symbol 'N').

102. In the case of J-shaped growth form, the population grows exponentially, and after attaining the peak value, the population

- (a) May abruptly crash  
(b) Is sustained infinitely  
(c) May gradually decline  
(d) Disappear

103. The maximum number of individuals of a population that can be sustained indefinitely in a given habitat, represents its

- (a) Carrying capacity (C)  
(b) Carrying capacity (N)  
(c) Carrying capacity (K)  
(d) Carrying capacity (D)

104. Who observed that, when resources in the habitat are unlimited, each species has the ability to realise fully its innate potential to grow in number?

- (a) Malthus                      (b) Lamarck  
(c) Wallace                      (d) Darwin

105. Fill in the blanks.

I. Natural selection operates to evolve the desired traits at the level of a

II. Population ecology links ecology to b and c

(a) a- Organism, b - Habitat, c - Niche

(b) a- Community, b - Habitat, c - Population genetics

(c) a -Population, b - Population genetics, c -Evolution

(d) a- Species, b - Evolution, c – Niche

106. A population has certain attributes that an individual organism does not. These are

a. Birth rate

b. Death rate

c. Sex ratio

d. Age distribution

(a) a and b

(b) b and c

(c) c and d

(d) a, b, c and d

107. In a pond there are 20 lotus plants last year and through reproduction 8 new plants are added, taking the current population to 28. What is the birth rate?

(a) 0.28 offspring per lotus per year

(b) 0.8 offspring per lotus per year

(c) 0.32 offspring per lotus per year

(d) 0.4 offspring per lotus per year

108. Per cent individuals of a given age or age group is called

(a) Age distribution

(b) Age pyramid

(c) Sex ratio

(d) Both (a) and (c)

109. The population size is more technically called

(a) Population gradient

(b) Population census

(c) Population pressure

(d) Population density

110. Population density is designated as

(a) 'D'

(b) 'P'

(c) N

(d) 'd'

111. The most appropriate measure of population density is generally

(a) Number

(b) Biomass

(c) Per cent cover

(d) All of the above

112. The population density can be measured in

(a) Number

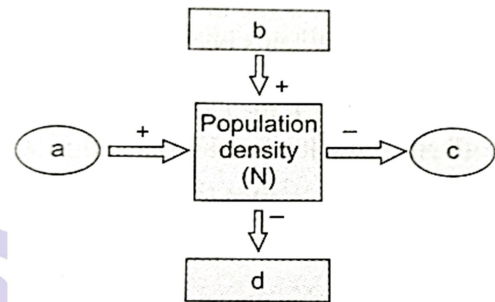
(b) Biomass and per cent cover

(c) Relative densities

(d) All of the above

113. Recognise the figure and find out the correct matching, where I = Immigration,

D = Mortality, B = Natality and E = Emigration



(a) a-B, b-E, c-D, d-I

(b) a-D, b-E, c-B, d-I

(c) a-D, b-I, c-B, d-E

(d) a-B, b-I, c-D, d-E

114. Under normal conditions, the most important factors influencing population density are

(a) Natality, and mortality

(b) Emigration and immigration

(c) Natality, mortality and immigration

(d) Natality, mortality, emigration and immigration

115. Which of the following is most important parameter chosen for assessing impacts of any biotic or abiotic factor on population growth?

(a) Intrinsic rate of natural increase

(b) Population density

(c) Mortality

(d) Natality

116. A population has more young individuals compared to the older individuals. What would be the status of the population after some years?

(a) It will decline

(b) It will stabilise

(c) It will increase

(d) It will first decline and then stabilise

117. S-shaped or sigmoid growth form shows an initial \_\_\_\_\_ in population size, followed by an \_\_\_\_\_ and then a \_\_\_\_\_ to a near-constant level.

(a) Rapid increase, exponential increase, gradual decline

(b) Gradual increase, exponential increase, rapid decline

(c) Gradual increase, exponential increase, gradual decline

(d) Gradual increase, exponential increase, gradual increase

118. In change in population size,  $N_t = N_0 + B + I - D - E$ . What do I, B, D stands for?  
 (a) Immigration, mortality, natality  
 (b) Immigration, natality, mortality  
 (c) Emigration, natality, mortality  
 (d) Mortality, natality, immigration

119. Populations evolve to maximize their reproductive fitness, also called Darwinian fitness. Choose the incorrect option for this.

- (a) Breed once-Pacific salmon fish  
 (b) Breed many times-Birds  
 (c) Large progeny-Pelagic fishes  
 (d) Small progeny-Oysters

120. Read the following statements and choose the correct option.

I. Zygote formation is followed by formation and development of blastocyst.  
 II. The vasa efferentia leave the testis and open into vas deferens.

III. Mammary tubules is connected to lactiferous duct.

IV. Perimetrium is the external glandular layer of uterus.

V. Throw the used napkins in the drainpipe of toilets or in the open area. How many of the above statements are correct?

- (a) One (b) Two  
 (c) Three (d) Four

121. Match the following columns and choose the correct option.

Column I	Column II
1. Spermatids	a. Ovum
2. Zona pellucida	b. Layer around ovum
3. Secondary oocyte	c. Secondary spermatocyte
4. Gamete mother cell	d. Oogonia

- (a) 1-c, 2-b, 3-a, 4-d (b) 1-a, 2-b, 3-c, 4-d  
 (c) 1-c, 2-b, 3-d, 4-a (d) 1-b, 2-c, 3-d, 4-a

122. Which follicle is characterised by a fluid filled cavity?

- (a) Tertiary (b) Primary  
 (d) Secondary (d) All of the above

123. During copulation (coitus) semen is released by the penis into the vagina. This is called

- (a) Spermiation (b) Insemination  
 (c) Spermiogenesis (d) Fertilisation

124. Read the following statements and choose the correct option.

I. The ovaries produce the female gamete (ovum) and some steroid hormones (pituitary hormones).

II. Ovarian follicles in different stages of development are embedded in the stroma.

III. The male external genitalia is called testis.

IV. The mammary glands are one of the female secondary sexual characteristics.

Incorrect statement(s) is/are

- (1) Only I  
 (2) Only II and III  
 (3) All statements are correct  
 (4) Only I and III

125. Correctly matched pair is

- (a) Bartholin's gland-Erectile body in female homologous to glans penis of male  
 (b) Sexual intercourse-Coitus  
 (c) Colostrum Secretion found in seminal fluid  
 (d) Areola-Pigmented triangular area around the nipple.

126. Column I contains terms and Column II contains definitions. Match them correctly and choose the right answer

Column I	Column II
(A) Parturition	(a) Attachment of zygote to endometrium
(B) Gestation	(b) Release of egg from Graafian follicle
(C) Ovulation	(c) Delivery of baby from uterus
(D) Implantation	(d) Duration between pregnancy and birth
(E) Conception	(e) Formation of zygote by fusion of the egg and sperm
	(f) Stoppage of ovulation and menstruation

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

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

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

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

127. After attachment of trophoblast to endometrium, which of the following cells divide rapidly and covers the blastocyst?

- (a) Uterine cells (b) Stem cells  
 (c) Inner cell mass (d) Trophoblast

128. Match the following and choose the correct options:

Column I  
(A) Trophoblast  
of

Column II  
Embedding

(B) Cleavage  
that

blastocyst in the  
endometrium  
(ii) Group of cells  
would

differentiate as

(C) Inner cell mass

embryo  
(iii) Outer layer of  
blastocyst

attached to

(D) Implantation  
divisions

the endometrium  
(iv) Mitotic  
of zygote

Options:

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

129. Find the odd one out from the given structures with reference to the male reproductive system.

- (a) Rete testis (b) Epididymis  
(c) Isthmus (d) Vasa efferentia

130. Match the following:

Set I  
(A) Inguinal canal

Set II  
(a) Network of  
seminiferous

tubules  
(B) Rete testis  
sexual

(b) Secondary  
characters  
(c) For

(C) Leydig cells  
descending of

testis

(D) Prepuce  
of

(d) Dorsal bundles

(E) Corpora cavernosa  
skin of

muscles

(e) Terminal

penis

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

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

131. Consider the following structures in a human male:

- (I) Bulbourethral glands  
(II) Vas deferens  
(III) Prostate gland  
(IV) Seminal vesicles

Semen includes the secretions of

- (a) (I), (II), (III), (IV)  
(b) (I), (II), (III)  
(c) (I), (III), (IV)  
(d) (II), (III), (IV)

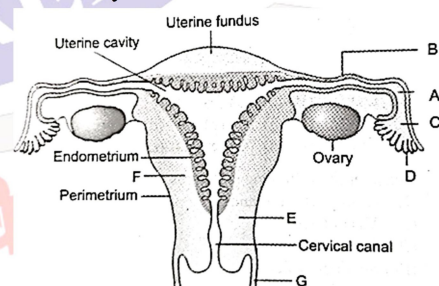
132. In seminal plasma, the fluid part of semen is contributed by

- i. Seminal vesicle ii. Prostate  
iii. Urethra iv. Bulbourethral gland  
(a) i and ii (b) i and iv  
(c) i, ii and iv (d) ii, iii and iv

133. Find out the incorrect match:

- (a) Foreskin-Loose fold of skin covering testes  
(b) Epididymis-Located along the posterior surface of each testis  
(c) Sertoli cells-Provide nutrition to germ cells  
(d) Vasa efferentia-Carries sperm from rete testis to epididymis

134. 22. The figure given below depicts a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of A-F have been correctly identified?



- (a) C-Infundibulum, D-Fimbriae, E-Cervix  
(b) D-Oviducal funnel, E-Uterus, F-Cervix  
(c) A-Perimetrium, B-Myometrium, C-Fallopian tube  
(d) B-Endometrium, C-Infundibulum, D-Fimbriae

135. Which is correct sequence of duct of mammary gland through which milk is released from mammary gland?
- (a) Alveoli Mammary tubules → Mammary duct → Mammary ampulla → Lactiferous duct → Outside
- (b) Alveoli Mammary duct Mammary tubules → Mammary ampulla → Lactiferous duct → outside
- (c) Alveoli Mammary duct → Mammary ampulla → Mammary tubules → Lactiferous duct → outside
- (d) Alveoli Mammary ampulla → Mammary tubules → Mammary duct → Lactiferous duct → Outside
136. Spermiation refers to the process of release of sperms from
- (a) Seminiferous tubules (b) Epididymis
- (c) Vas deferens (d) Prostate gland

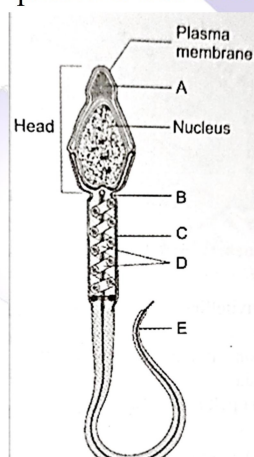
137. Among the following, identity those which are diploid?

(I) Spermatogonia (II) Spermatid

(III) Primary spermatocyte  
(IV) Secondary spermatocyte  
(V) Sertoli cells

(a) (II) and IV (b) (I), (III), (V)  
(d) (II), (V) (d) All the above

138. Consider the following diagrammatic representation of sperm and answer the questions that follow:



- (I) Provides energy for movement of sperm.
- (II) It is enzyme filled and helps in fertilization.
- (III) It helps in movement of sperm.

(IV) Centriole is present in it.

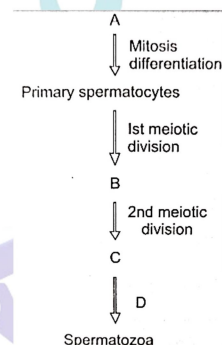
- (a) (I)-(A), (II)-(B), (III)-(C), (IV)-(D)  
(b) (I)-(D), (II) (B), (III)-(E), (IV)-(C)  
(c) (I)-(D), (II)-(A), (III)-(E), (IV)-(B)  
(d) (I)-(A), (II) (B), (III)-(C), (IV)-(E)

139. Consider the following statements with two blanks A and B. Find out the option which correctly fills up these blanks.
- After spermiogenesis, sperm head become embedded in the A, and are finally released from the seminiferous tubules by process called B

- (a) Sertoli cells                      B  
Spermatogenesis
- (c) Nurse cells                      Spermatogenesis
- (c) Sertoli cells                      Spermiation
- (d) Interstitial cells                  Spermiation

140. Presence of mature Graafian follicle in the ovary of a healthy human female is observed around
- (a) 5-8 day of menstrual cycle  
(b) 18-23 day of menstrual cycle  
(c) 11-17 day of menstrual cycle  
(d) 24-28 day of menstrual cycle

141. Lebal A-D



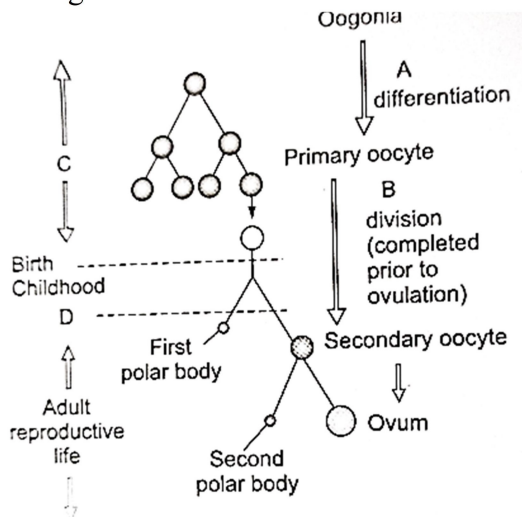
- (a) A-Sperm mother cell, B-Secondary spermatocyte, C-Spermatid, D-Differentiation
- (b) A-Spermatogonia, B-Secondary spermatocyte, C-Spermatid, D-Differentiation
- (c) A-Spermatogonia, B-Secondary spermatocyte, C-Sperm, D-Differentiation
- (d) A-Sperm mother cell, B-Secondary spermatocyte, C-Differentiation, D-Spermatid

142. Correct sequence in the formation of ovum is

(a) Primordial germ cells → Secondary oocyte → Ovum → Ootid

- (b) Oogonium Primary oocyte Secondary oocyte → Ootid Ovum  
 (3) Oogonium oocyte → Ovum  
 (4) Oogonium → Primordial germ cells → Ootid → Ovum

143. Correctly identify the labels A-D in the given figure.



- (a) A-1st meiosis, B-2nd meiotic, C-Foetal life, D-Puberty  
 (b) A-1st meiosis, B-2nd meiotic, C-Pre-puberty life, D-Puberty  
 (c) A-Mitosis, B-1st meiotic, C-Foetal life, D-Puberty  
 (d) A-Mitosis, B-2nd meiotic, C-Foetal life, D-Puberty

144. Acrosomal reaction of the sperm takes place due to

- (a) Its contact with zona pellucida of the ova  
 (b) Androgens produced in the uterus  
 (c) Reactions within the uterine environment of the female  
 (d) Reactions within the epididymal environment of the male

145. Which of the following statements are correct?

- (I) Each spermatogonium is diploid and contains 46 chromosomes.  
 (II) Spermatogenesis begins at puberty.  
 (III) Primary spermatocyte undergoes first meiotic division to form two unequal haploid cells called secondary spermatocytes.  
 (IV) LH acts at the Leydig cells and stimulates synthesis and secretion of estrogen.

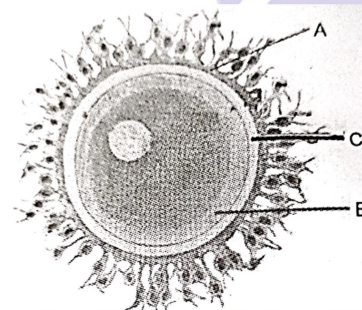
(a) (I), (II), (III), and (IV)

- (b) (I) and (II)  
 (c) (I), (II), and (IV)  
 (d) (II), (III), and (IV)

146. Identify the incorrect statement:

- (a) Each primary oocyte gets surrounded by a layer of granulosa cells and is called the primary follicle.  
 (b) At puberty only 50,000 primary follicles are left in each ovary.  
 (c) The primary follicles get surrounded by more layers of granulosa cells and a new theca and are called secondary follicles.  
 (d) The secondary follicle soon transforms into a tertiary follicle which is characterized by a fluid-filled cavity called antrum.

147. Identify the structure marked as A, B, and C in the given diagram at ovum:



- (a) A-Perivitelline space, B-Zona pellucida, C-Corona radiata  
 (b) A-Corona radiata, B- Perivitelline space, C-Zona pellucida  
 (c) A-Zona pellucida, B- Perivitelline space, C-Corona radiata  
 (d) A-Perivitelline space, B-Corona radiata, C-Zona pellucida

148. Morula is

- (a) Foetus with 8 to 16 blastomeres  
 (b) Embryo with 32 to 64 blastomeres  
 (c) Embryo with 8 to 16 blastomeres  
 (d) Foetus with 32 to 64 blastomeres

149. The immature male germ cell undergo division to produce sperms by the process of spermatogenesis. Select the correct statement with regard to this.

- (a) Primary spermatocytes divide by mitotic cell division.  
 (b) Secondary spermatocytes have 23 chromosomes and undergo second meiotic division.  
 (c) Spermatogonia have 46 chromosomes and always undergo meiotic cell division.

(d) Spermatozoa are transformed into spermatida

150. Arrange the phases of menstrual cycle in correct order:

A. Proliferative  
C. Ovulatory  
(a) BACD  
(c) BADC

B. Menstrual  
D. Secretory  
(b) ABCD  
(d) ADBC

151. Which of the following statements about the female reproductive system are true or false?

- (a) Both testosterone and progesterone are necessary for ovulation to take place.
- (b) Oestrogen tends to inhibit the production of FSH-by the anterior pituitary gland.
- (c) Fertilization of ovum by the spermatozoa normally takes place in uterus.
- (d) Progesterone production is largely under the control of LH.
- (e) Throughout the part of the menstrual cycle that follows ovulation, there is a slight rise in body temperature.

Your views are indicated by using +(true) or (false).

Choose the correct option

(a)  $- + - + -$  (c)  $- - + + +$   
(c)  $- + - + +$  (d)  $+ + - - -$

152. Which of the given structures in humans would have 23 chromosomes?

(a) Spermatogonia      (b) Zygote  
(c) Oogonia          (d) Secondary  
oocyte

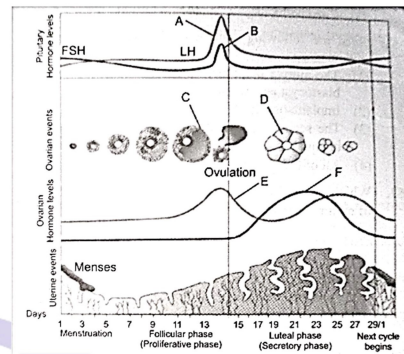
153. Which of the following hormones attain peak during the middle of menstrual cycle in human females?

(I) Estrogen  
(III) LH  
Progesterone

(II) FSH  
(IV)

(a) (I), (II), (III) and (IV)  
(b) (II), (III)  
(c) (I), (II) and (III)  
(d) (I), (IV)

154. Consider the following diagrammatic presentation of various events during a menstrual cycle and answer the questions that follow:



(I) Fall in level of which of the labeled hormone causes menstruation?

(II) Which labeled structure represents developing corpus luteum?

(III) Which labeled hormone attains two peaks during the cycle?

(IV) Pre-ovulatory surge of which hormone induces rupture of Graafian follicle for ovulation?

(a) (1)-F, (II)-D, (III) - E, (IV) - A

(b) (1)C, (II)-D, (III) - F, (IV) - B

(c) (1) F. (II) - D, (III) - E, (IV) - B

(d) (1)-E, (II) - D, (III) - F, (IV) - A

155. Which of the following statement is correct?

(a) The reproductive cycle in female primates is called menstrual cycle.

(b) The first onset of menstrual cycle is called menarche.

(c) The termination of menstrual cycle at the end of reproductive age is called menopause.

(d) Menstruation is repeated every 28 days due to increase in level of progesterone hormone.

(a) (a), (b) and (d)      (b) (a) and (c)

(c) (a), (b) and (c)      (d) All of the above

156. Trace a sperm cell from the structure where it is produced till fertilization of the egg:

(a) Seminiferous tubule

(b) Vasa deferens      (c) Uterus

(d) Fallopian tube      (e) Vagina

(f) Epididymis      (g) Urethra

(a) f, a, b, g, e, c, d      (b) a, f, b, g, e, c, d

(c) a, f, b, g, e, d, c      (d) a, b, f, g, e, c, d

157. The membranous covering of the ovum during ovulation is called

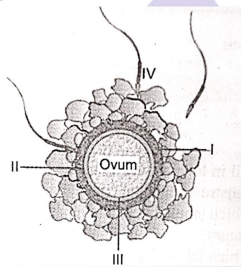
(a) Zona radiata radiata (b) Corona

(c) Zona pellucida      (d) Chorion

158. Read the following statements and choose the correct option.

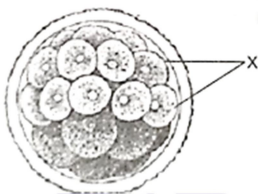
- (a) The morula continues to divide and transforms into blastocyst as it moves further into the uterus.
- (b) Implantation leads to pregnancy
- (c) The second meiotic division in secondary oocyte is unequal.
- (d) All of the above

159. Which of the following labeled part in the given diagram of ovum is perivitelline space?



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

160. The labeled cells 'X' in the given state of growth of human embryo are called



- (a) Blastopore
- (b) Blastomeres
- (c) Zygote
- (d) Polar bodies

161. Find the odd one among the given structures.

- (a) Fimbriae
- (b) Infundibulum
- (c) Labia minora
- (d) Isthmus

162. Read the following statements and choose the incorrect one.

- (a) The oviducts, uterus and vagina are female accessory ducts.
- (b) The reproductive cycle of female non-primates is called menstrual cycle.
- (c) The process of childbirth is called parturition which is induced by a complex neuroendocrine mechanism involving cortisol, estrogens, and oxytocin.
- (d) Mammary glands differentiate during pregnancy and secrete milk after child-birth.

163. The blastomeres in the blastocyst are arranged into an outer layer called \_\_\_\_A\_\_\_\_

\_\_\_\_\_ and inner group of cells attached to trophoblast called the \_\_\_\_ B \_\_\_\_

- (a) A is trophoblast and B is inner cell mass
- (b) A is inner cell mass and B is trophoblast
- (c) Both are trophoblast
- (d) Both are inner cell mass

164. Seminal fluid has a pH of about:

- (a) 6.0
- (b) 7.4
- (c) 8.5
- (d) 9.0

165. Read the following statements and choose the incorrect option.

- (a) Sperm is a microscopic structure composed of a head, neck, a middle piece, and a tail.
- (b) The primary oocyte retains the bulk of the nutrient rich cytoplasm of the secondary oocyte,
- (c) The tertiary follicle further changes into the mature follicle or Graafian follicle.
- (d) The first polar body born out of first meiotic division divide further or degenerate, at present we are not very certain about this.

166. The sex of the baby is determined by the

- (a) Mother
- (b) Father
- (c) Both father and mother
- (d) None of the above

167. The urethra originates from the urinary bladder and extends through the penis to its external opening called

- (a) Urethra
- (b) Urethral meatus
- (c) Vulva
- (d) Ureter

168. Which of the following is not included in male sex accessory ducts?

- (a) Rete testis
- (b) Vasa efferentia
- (c) Seminiferous tubules
- (d) Epididymis

169. Which acid occurs in semen?

- (a) Citric acid
- (b) Malic acid
- (c) Oxaloacetic acid
- (d) Succinic acid

170. Match the following columns and choose the correct option.

Column I	Column II
1. Parturition	a. Release of ovum
2. Spermiation	b. Childbirth
3. Ovulation	c. Blastomeres
4. Morula	d. Release of sperms from seminiferous tubules

171. In the human mammary gland, mammary ampulla leads into  
(a) Mammary lobe (b) Lactiferous duct  
(c) Mammary tubules (d) Mammary duct
172. Bartholin's glands occur in  
(a) Females and help in vestibular lubrication  
(b) Females and produce oestrogen for regulating secondary sexual characters  
(c) Males and form liquid part of spermatid fluid  
(d) Males and produce alkaline fluid for neutralizing urethral acidity
173. During oogenesis, the small structure separated from egg is  
(a) Polar bodies  
(b) Secondary endosperm  
(c) Herring bodies  
(d) Hela cells
174. Human gametes differ from all other body cells as they are  
(a) Motile (b) Growing  
(c) Haploid (d) Without cell wall
175. Non-cellular layer is  
(a) Theca interna (b) Membrana granulosa  
(c) Corona radiata (d) Zona pellucida
176. Read the following statements and choose the correct option.  
(a) In some women, the hymen persists even after coitus.  
(b) Several steroid hormones are synthesised in ovaries.  
(c) Uterus is supported by ligaments attached to the pelvic wall.  
(d) All of the above
177. The acrosome plays a role in  
(a) Fusion of nuclei of gametes  
(b) Motility of sperm  
(c) Penetration of sperm into ovum  
(d) All of the above
178. spermatogenesis occurs in which stage?  
(a) First meiotic division  
(b) Second meiotic division  
(c) Growth phase  
(d) Spermiogenesis
179. Which is incorrect for human female?  
(a) Menstrual cycle takes 28 days  
(b) Menopause occurs at 45-55 years  
(c) Ovulated egg released during pregnancy die  
(d) Menstruation takes 4 days
180. What happens during fertilisation in humans after many sperms reach close to the ovum?  
(a) Only two sperms nearest the ovum penetrate zona pellucida.  
(b) All sperms except the one nearest to the ovum lose their tails.  
(c) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida.  
(d) Cells of acrosome helps one sperm enter ovum.