NEW STANDARD ACADEMY

Test Type : 05

Do not open this Test Booklet until you are asked to do so.

13-01-25

PRE-MEDICAL : 11th Undergoing Students

Read carefully the Instructions on the Back Cover of this Test Booklet.

Important Instructions :

1. On the answer sheet, fill in the particulars on Side-1 and Side -2 carefully with blue/black ball point pen only.
2. The test The test is of 3 hours 20 minutes duration and this Test Booklet contains 200 questions. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.
3. In this Test Paper, each subject will consist of two sections. Section A will consist of 35 questions (all questions are mandatory) and Section B will have15 questions. Candidate can choose to attempt any 10 question out of these 15 questions. In case if candidate attempts more than 10 questions, first 10 attempted questions will be considered for marking
4. In case of more than one option correct in any question, the best correct option will be considered as answer.
5. Use Blue/Black Ball Point Pen only for writing particulars on this page/marking responses.
6. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
7. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
8. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Form No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
9. Use of white fluid for correction is not permissible on the Answer Sheet.

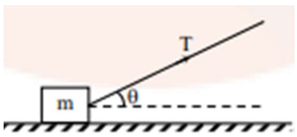
Name of the Candidate(In Capitals) _____

Date of Examintation _____

Candidate`s Signature:_____ Invigilator`s Signature: _____

PHYSICS

1. A overhead tank of capacity 1000 liter has to be filled in 1/2 hour using water pump. Tank is kept at a height 10 m above ground and water level is 10 m below ground. The opening of inlet pipe inside tank is $1.11 cm^2$. Assuming the efficiency of motor to be 60%, the electric power used is (Neglect viscosity)
   (a) 118 W (b) 130 W
   (c) 146 W (d) 198 W
2. Power developed by a person on eating 100 g of ice per minute is
   (a) 130 W (b) 560 cal/sec
   (c) 560 J/sec (d) none of these
3. The only force acting on a block is along x-axis is given by $F = -\left(\frac{4}{x^2+2}\right)N$. When the block moves from x = –2 m to x = 4 m, the change in kinetic energy of block is
   (a) Positive
   (b) Negative
   (c) Zero
   (d) May be positive or negative
4. A force $\vec{F} = 8\hat{\imath} - 6\hat{\jmath} - 10\hat{k}$ Newton produces an acceleration of $1 ms^{-2}$ in a body. The mass of the body is
   (a) 10 kg (b) $10\sqrt{2}$ kg
   (c) $10\sqrt{3}$ kg (d) 200 kg
5. A cord is used to lower vertically a block of mass M a distance d at a constant downward acceleration of g/4. Then the work done by the cord on the block is
   (a) Mgd/4 (b) 3 Mgd/4
   (c) Mgd (d) –3Mgd / 4
6. If v, P and K denote the velocity, momentum and kinetic energy of a particle then
   (a) P = dK/dv (b) P = dK/dt
   (c) P = dv/dt (d) P = (dK/dv) (dK/dt)
7. A block of mass m slides along the track with kinetic friction μ. A man pulls the block through a rope which makes an angle θ with the horizontal as shown in the figure. The block moves with constant speed V. Power delivered by the man is



   (a) TV (b) TV cosθ
   (c) (T cos θ – μ mg)V (d) zero
8. A particle of mass m = 9×10^{-31} kg moving towards the wall of a vessel at a velocity of v = 600 ms^{-1} strikes it at an angle of 60° to the normal and rebounds at the same angle at the same speed. The impulse of the force experienced by the wall during the impact is
   (a) 3×10^{21} N s
   (b) 9×10^{-28} N s
   (c) 5.4×10^{-28} N s
   (d) 5.4×10^{-27} N s
9. A body of mass m = 3.513 kg is moving along the x-axis with a speed of 5.00 ms^{-1} . The magnitude of its momentum is recorded as
   (a) 17.6 kg m s^{-1} (b) 17.565 kg m s^{-1}
   (c) 17.56 kg m s^{-1} (d) 17.57 kg m s^{-1}
10. A bus and a car, moving with the same speed are brought to rest by applying the same retarding force then
    (a) bus will come to rest in a shorter distance
    (b) car will come to rest in a shorter distance
    (c) both will come to rest in the same distance
    (d) none of the above
11. A bullet of mass m and velocity a is fired into a large block of wood of mass M. The final velocity of the system is
    (a) $\frac{M}{m+M}a$
    (b) $\frac{m+M}{m}a$
    (c) $\frac{m+a}{m}a$
    (d) $\frac{m}{m+M}a$
12. A block hangs freely from the end of a spring. A boy then slowly pushes the block upwards so that the spring becomes strain free. The gain in gravitational potential energy of the block during this process is equal to
    (a) work done by the boy against the gravitational force acting on the block
    (b) loss of energy stored in the spring minus the work done by the tension in the spring
    (c) work done on the block by the boy plus the loss of energy stored in the spring
    (d) work done on the block by the boy minus the work done by the tension in the spring
13. Force acting on a particle moving in a straight line varies with the velocity of the particle as F $= \frac{k}{v}$. Here K is constant. The work done by this force in time t is
    (a) Kt/v^2 ·
    (b) 2Kt
    (c) Kt
    (d) $2Kt/V^2$
14. A particle of mass 0.5 kg is displaced from position $\vec{r_1}$ (2, 3,1) to $\vec{r_2}$ (4, 3, 2) by applying a force of magnitude 30 N which is acting along $(\hat{\imath} + \hat{\jmath} + \hat{k})$. The work done by the force is
    (a) $10\sqrt{3}$ J (b) $30\sqrt{3}$ J
    (c) 30 J (d) none of these

15. A uniform chain has a mass m and length l. It is held on a frictionless table with one sixth of its length hanging over the edge. The work done in just pulling the hanging part back on the table is
(a) mg $\frac{l}{72}$ b) mg $\frac{l}{36}$
(c) $\frac{mg}{12}$ l (d) $\frac{mgl}{6}$

16. A body of mass 1 kg is rotated in a horizontal circle of radius 1 m and moves with velocity 2m/sec. The work done in 10 revolutions is
(a) 40 J (b) 20 J
(c) 4× 2 π (10)J (d) zero

17. The potential energy of a particle of mass 5 kg moving in the x–y plane is given by, $U = (-7x + 24y)J$ where x and y being in metre. If the particle starts from rest from origin, then speed of particle at t = 2s is
(a) 5 m/s (b) 14 m/s
(c) 17.5 m/s (d) 10 m/s

18. By burning 1 g of coal, the energy produced is 2 kcal. Then for 1 kWh, the quantity of coal so required will be nearly
(a) 9 kg (b) $\frac{4}{5}$ kg
(c) $\frac{3}{7}$ kg (d) $\frac{3}{14}$kg

19. If the engine power is 3.3kW and it is 60% efficient, how much water will it pump in 5s from a height of 10m?
(a)60kg (b) 100kg
(c)75kg (d) 80kg

20. A body moves a distance of 10 m along a straight line under the action of a force of 5 newton. If the work done is 25 joule, the angle which the force makes with the direction of motion of the body is
(a) 0° (b) 30°
(c) 60° (d) 90°

21. A particle moves along the x-axis from x = 0 to x = 5m under the influence of a force given by $F = 7 - 2x+3x^2$ .The workdone in the process is
(a) 70 (b) 270
(c) 35 (d) 135

22. A long spring is stretched by x cm its PE is U. If the spring is stretched by Nx cm the PE stored in it will be
(a) U/N (b) NU
(c) N^2U (d) U/N^3

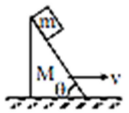
23. Two equal masses are attached to the two ends of a spring of spring constant K. They are then pulled out symmetrically so that the spring extends by x. The work done by spring force on each block is
(a) 1/2 Kx^2 (b) -1/2 Kx^2
(c) 1/4 Kx^2 (d) -1/4Kx^2

24. The negative of the work done by the conservative internal force on a system always equals the change in
(a) total energy (b) kinetic energy (c) potential energy (d) none of these

25. A particle moves in a circle of radius r under the action of a centripetal force equal to $\frac{-k}{r^2}\hat{r}$, where k is a constant. The total energy of the particle is
(a) k/r (b) k/2r
(c)- k/2r (d)- k/r

26. A block of mass M is hanging over a smooth and light pulley through a light string. The other end of the string is pulled by a constant force F. The kinetic energy of the block increases by 20J in 1s. (a) The tension in the string is Mg.
(b) The tension in the string is F.
(c) The work done by the tension on the block is 20J in the above 1s.
(d) The work done by the force of gravity is 20J in the above 1s.

27. A block of mass m is stationary with respect to wedge of mass M moving with uniform speed v on horizontal surface. Find the work done by friction force on the block in t second



(a) zero (b) - $\frac{mgvt}{2}$ sin2θ
(c) - $\frac{mgvt}{2}$ (d) - $\frac{mgvt}{2}\sin^2\theta$

28. A spherical ball of mass 4 kg, moving with 10 m/s, makes a head-on elastic collision with another sphere of mass 12 kg at rest. The speed of the 12 kg body is
(a) 4 m/s (b) 5 m/s
(c) 6 m/s (d) 3 m/s

29. A body dropped from a height 1m onto a floor rises a height of 25 cm after the first rebound. The coefficient of restitution is
(a) 3/4 (b) 1/4
(c) 1/2 (d) 1/3

30. If a particle of mass m_1 approaches another particle of mass m_2 initially at rest, with speed v_1 , the speed of the cm of the system is $v_{cm} = \frac{m_1v_1}{m_1+m_2}$ before collision takes place. If the collision is elastic, the speed of the cm of the system after the collision is
(a) $\frac{m_2v_1}{m_1+m_2}$ (b) $\frac{m_1v_1}{m_1+m_2}$
(c) $\frac{m_2-m_1}{m_2+m_1}$ (d) zero

31. A sphere of mass m moving with a constant velocity u hits another stationary sphere of the

same mass. If e is the coefficient of restitution, then ratio of velocities of the two sphere after collision will be

(a) $\frac{1-e}{1+e}$ (b) $\frac{1+e}{1-e}$

(c) $\frac{e+1}{e-1}$ (d) $\frac{e-1}{e+1}$

32. A bullet fired into a fixed target loses half its velocity after penetrating 3 cm. How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion?

(a) 1.5 cm (b) 1.0 cm

(c) 3.0 cm (d) 2.0 cm

33. A spherical ball of mass 20 kg is stationary at the top of a hill of height 100 m. It rolls down a smooth surface to the ground, then climbs up another hill of height 30 m and finally rolls down to a horizontal base at a height of 20 m above the ground. The velocity attained by the ball is

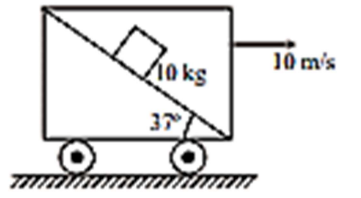
(a) 10 m/s (b) 10 $\sqrt{30}$ m / s (c) 40 m/s (d) 20 m/s

34. A body of mass m is accelerated uniformly from rest to a speed v in a time T. The instantaneous power delivered to the body as a function of time is given by

(a) $\frac{1}{2}\frac{mv^2}{T^2}t$ (b) $\frac{1}{2}\frac{mv^2}{T^2}t^2$

(c) $\frac{mv^2}{T^2}t$ (d) $\frac{mv^2}{T^2}t^2$

35. A block of mass 10 kg is released on a fixed wedge inside a cart which is moved with constant velocity 10 m/s towards right. Take initial velocity of block with respect to cart, zero. Then work done by normal reaction on block in 2 s from ground frame will be : (g =10 m / s^2)



(a) 1320 J (b) 960 J

(c) 1200 J (d) 240 J

36. A bullet of mass 0.01 kg, travelling at a speed of 500 ms^{-1} , strikes a block of mass 2 kg, which is suspended by a string of length 5 m, and emerges out. The block rises by a vertical distance of 0.1 m. The speed of the bullet after it emerges from the block is

(a) 55 ms^{-1} (b) 110 ms^{-1}

(c)220 ms^{-1} (d)440 ms^{-1}

37. You accidentally bump into a bookcase. It tilts briefly but then returns to upright, and you breathe a sigh of relief. When you first bumped the bookcase, its center of gravity moved

(a) upward and its gravitational potential energy increased.

(b) downward and its gravitational potential energy decreased.

(c) downward and its gravitational potential energy increased.

(d) upward and its gravitational potential energy decreased.

38. One end of an unstretched vertical spring is attached to the ceiling and an object attached to the other end is slowly lowered to its equilibrium position. If S be gain in spring energy & G be loss in gravitational potential energy in the process, then

(a) S = G (b) S = 2G

(c) G = 2S (d) None of these

39. A particle with total energy E moves in one dimension in a region where the potential energy is U(x). The acceleration of the particle is zero where

(a) U(x) = E (b) U(x) = 0

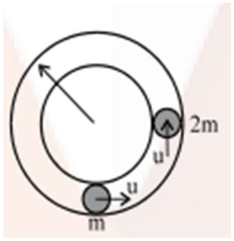
(c) $\frac{dU(x)}{dx}$ =0 (d) $\frac{d^2U(X)}{dx^2} = 0$

40. The displacement of a particle of mass 1 kg on a horizontal smooth surface is a function of time given by x = $\frac{1}{3}t^3$. The work done by an external agent for first one sec is

(A) 0.5 J (B) 2 J

(C) 0.60 J (D) none of these

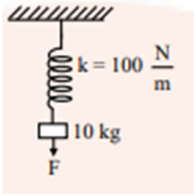
41. Two small bodies of masses 'm' and '2m' are placed in a fixed smooth horizontal circular hollow tube of mean radius 'r' as shown. The mass 'm' is moving with speed 'u' and the mass '2m' is stationary. After their first collision, the time elapsed for next collision is : [coefficient of restitution e = 1/2]



(a) $\frac{2\pi r}{u}$ (b) $\frac{4\pi r}{u}$

(c)$\frac{3\pi r}{u}$ (d) $\frac{12\pi r}{u}$

42. A vertical spring of force constant 100 N/m is attached with a hanging mass of 10 kg. Now an external force is applied on the mass so that the spring is stretched by additional 2 m. The work done by the force F is : (g = 10 m/s^2)



(a) 200 J (b) 400 J
(c) 450 J (d) 600 J

43. An electron of mass m moving with a velocity v collides head on with an atom of mass M. As a result of the collision a certain fixed amount of energy ΔE is stored internally in the atom. The minimum initial velocity possessed by the electron is
(a) $\sqrt{\frac{M\Delta E}{Mm}}$ (b) $\sqrt{\frac{2M\Delta E}{(M+m)m}}$
(c) $\sqrt{\frac{2(M+m)\Delta E}{Mm}}$ (d) None of these

44. The potential energy function associated with the force $\vec{F} = 4xy\hat{\imath} + 2x^2\hat{\jmath}$ is
(a) $U = -2x^2 y$ (b) $U = -2x^2 y$ constant
(c) $U = 2x^2 y$+ constant (d) not defined

45. The potential energy of a particle of mass m free to move along x-axis is given by $U = \frac{1}{2}kx^2$ for $x < 0$ and $U = 0$ for $x \geq 0$ (x denotes the x-coordinate of the particle and k is a positive constant). If the total mechanical energy of the particle is E, then its speed at $x = -\sqrt{\frac{2E}{k}}$ is
(a) zero (b) $\sqrt{2E/m}$
(c) $\sqrt{E/m}$ (d) $\sqrt{E/2m}$

46. A long spring, when stretched by a distance x has the potential energy U. On increasing the stretching to *nx*, the potential energy of the spring will be
(1) U/n (b) nU
(c) n^2U (d) U/n^2

47. The displacement x of a body of mass 1 kg on horizontal smooth surface as a function of time t is given by $x = t^4/4$ The work done in the first one second is
(a) $\frac{1}{4}J$ (b) $\frac{1}{2}J$
(c) $\frac{3}{4}J$ (d) $\frac{5}{4}J$

48. A bus of mass 1000 kg has an engine which produces a constant power of 50 kW. If the resistance to motion, assumed constant, is 1000 N. The maximum speed at which the bus can travel on level road and the acceleration when it is travelling at 25m / s will respectively be
(a) 50m /s, 1.0 m / s^2
(b) 1.0 m/s, 50m / s^2
(c) 5.0m / s, 10m /s^2
(d) 10 m/s, 5 m / s^2

49. A force $(3\hat{\imath} + 4\hat{\jmath})$ acts on a body and displaces it by $3\hat{\imath} + 4\hat{\jmath}$ m. The work done by the force is
(a) 10 J (b) 12 J
(c) 16 J (4) 25 J

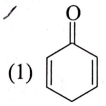
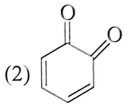
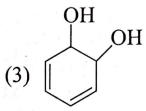
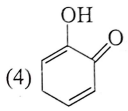
50. A block of mass 2 kg slipped up a slant plane requires 300 J of work. If height of slant is 10 m the work done against friction is
(a) 100 J (b) 200 J
(c) 300 J (4) zero

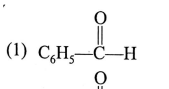
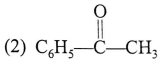
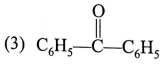
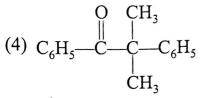
CHEMISTRY

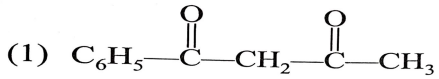
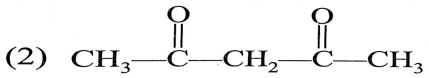
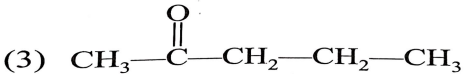
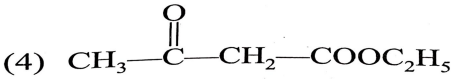
1. Choose the pair of chain isomer
(a) CH_3CHBr_2 and CH_2BrCH_2Br
(b) 1 –propanol and 2 propanol
(c) Neo- pentane and isopentane
(d) Diethyl ether and methyl-n- propyl ether

2. How many structural isomers (aldehyde+ ketone) are possible for $C_5H_{10}O$?
(a) 3 (b) 4 (c) 6 (d) 7

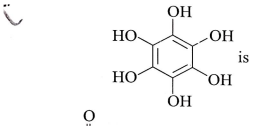
3. How many isomers of $C_4H_8O_2$ are carboxylic acids
(a) 2 (b) 3 (c) 4 (d) 5

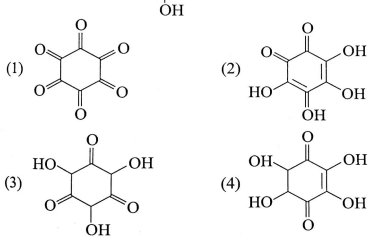
4. Which of the following show tautomerism?
(1) 
(2) 
(3) 
(4) 

5. Keto-enol tautomerism is observed in
(1) 
(2) 
(3) 
(4) 

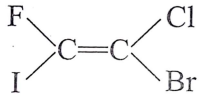
6. Which among the following compound will give maximum enol content in solution?
(1) 
(2) 
(3) 
(4) 

7. The most stable keto isomer of the following compound





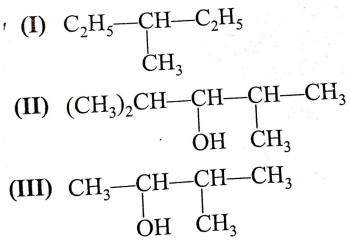
8. What is the configuration of the following compound?



(a) E (b) Z (c) syn (d) Anti

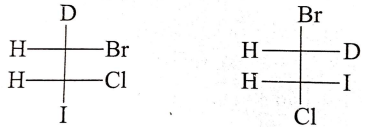
9. Which isomer below has a stable intramolecular H- bond?
   (a) Trans 3- fluoro propenoic acid
   (b) Cis -3 fluoro propenoic acid
   (c) 2- fluoro propenoic acid
   (d) 4-fluoro-3- methyl-3 – pentenoic acid

10. Observe the following structures I to III



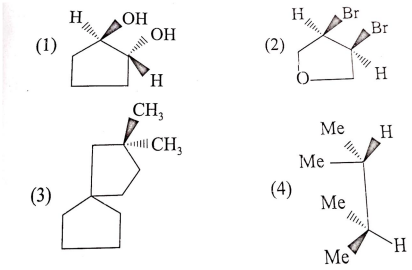
Correct statement is:
   (a) All three are chiral compounds
   (b) I and II are Chiral
   (c) Only II is chiral
   (d) Only III is Chiral

11. The two Compounds given below are

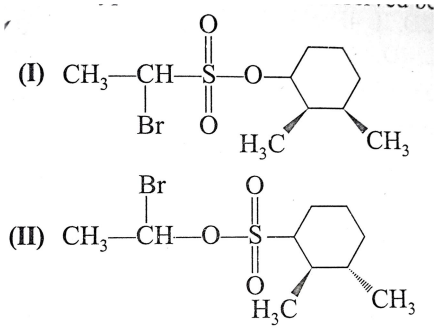


(a) Enantiomer (b) Identical
(c) Meso compound (d) Diastereomers

12. Which of the following compound possess plane of symmetry?

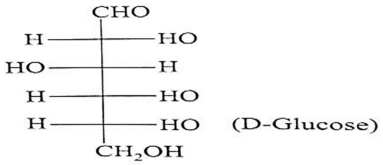


13. Which type of isomerism is observed between I and II ?



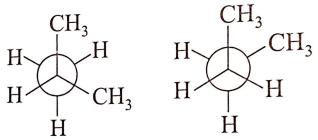
   (a) Functional Isomerism
   (b) Metamerism
   (c) Optical isomerism
   (d) Geometrical isomerism

14. The IUPAC name of the compound is



   (a) (2D,3D,4L,5D)2,3,4,5,6-pentahydroxyhexanal
   (b) D-2,3,4,5,6- pentahydroxyhexanal
   (c) 6-oxo-(2D,3D,4L,5D)2,3,4,5,6-pentahydroxyhexane
   (d) (2D,3D,4L,5D)2,3,4,5,6-pentahydroxohexane

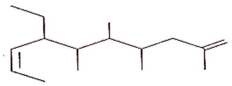
15. The structure below are



   (a) Not isomers
   (b) structural isomers
   (c) Enantiomers
   (d) Conformers

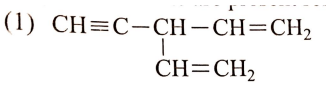
16. Which of the following conformations of cyclohexane is trasition state conformation?
   (a) Chair
   (b) Twist boat
   (c) Boat
   (d) Half chair

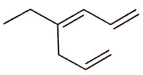
17. The IUPAC name of

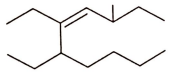


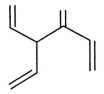
   (a) 7-Ethyl-2,4,5,6-tetramethyldeca-1,8-diene
   (b) 7-Ethyl-2,4,5,6-tetramethyldeca-1,7-diene
   (c) 7-(1-propenyl)-2,3,4,5- tetramethyl-non-1-ene
   (d)4 Ethyl-5,6,7,9- tetramethyldeca-2,9-diene

18. In which of the following structures two ethyl and one methyl substituents are present respectively?

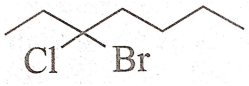
(1) 

(2) 

(3) 

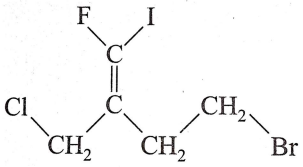
(4) 

19. Which is the correct IUPAC name of the following compound



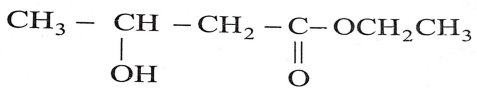
(a) 3-Bromo-3-chloroheptane
(b) 5-Bromo-5-chloroheptane
(c) 1-Bromo-1-chloro-1-ethyl pentane
(d) 3-chloro-3- bromoheptane

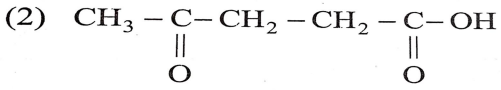
20. The correct IUPAC name of the compound is

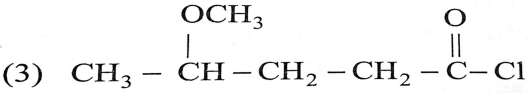


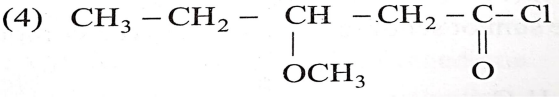
(a) 4-Bromo-1-chloro-2-fluoroiodomethylbutene
(b) 4-Bromo-2-chloromethyl-1-fluoro-1-iodobut-1-ene
(c) 2-(2-Bromoethyl)-3-chloro-1- fluoro-1-iodoprop-1-ene
(d) 1- bromo-3-chloromethyl-4-fluoro-4-iodobut-1-ene

21. What is the correct structure of the compound having IUPAC name 3-Methoxy pentanoyl Chloride?

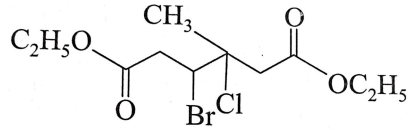
(1) 

(2) 

(3) 

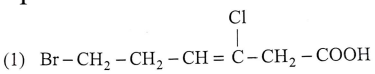
(4) 

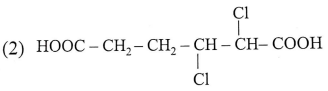
22. What is the correct IUPAC name of the compound given below?

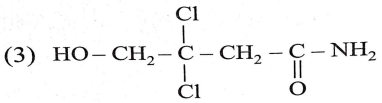


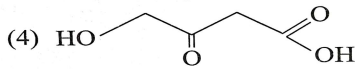
(a) 3-Bromo-4-chloro-4-methyl ethyl hexanedioate
(b) Ethyl-4-bromo-3-chloro-3-methyl hexanedioate
(c) Diethyl-4-bromo-3-chloro-3-methyl hexanedioate
(d) Diethyl-3-bromo-4-chloro-4-methyl hexanedioate

23. Which of the following structures contains one principal functional group, two secondary functional groups, contains 6 members chain as a parent chain?

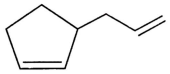
(1) 

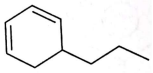
(2) 

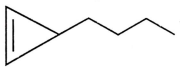
(3) 

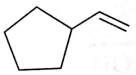
(4) 

24. What is the correct structure of the compound having IUPAC name 3 - (prop-2-enyl) cyclopent - 1 - ene?

(1) 

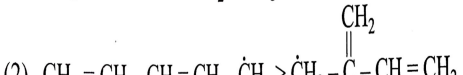
(2) 

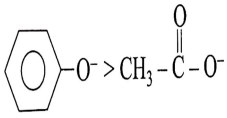
(3) 

(4) 

25. Which of the following is true for stability between the two structures?

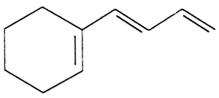
(1) 

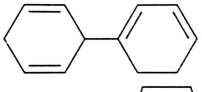
(2) 

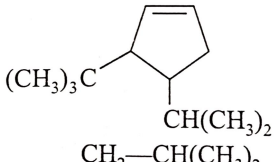
(3) 

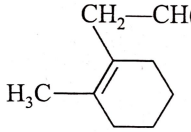
(4) All of these

26. What is the correct structure of 1-(2-methyl propyl)-2-methyl cyclohex-1-ene?

(1) 

(2) 

(3) 

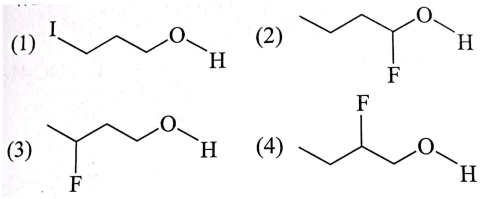
(4) 

27. Decreasing –I effect of given groups is:

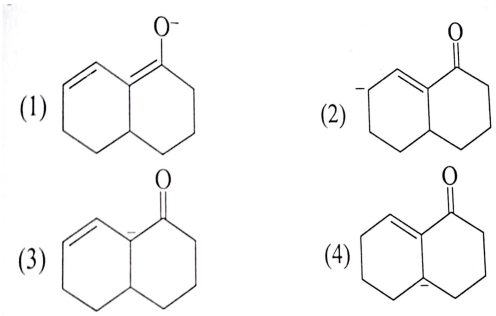
(a) CN (c) NO_2
(c) NH_2 (d)F

28. The strongest acid among the following compounds is
(a) HOOC-$(CH_2)_2$- COOH
(b) H_3N^+-$(CH_2)_2$- COOH
(c) F-$(CH_2)_2$- COOH
(d) CH_3-$(CH_2)_2$- COOH

29. Which of the following has most acidic proton?



30. Which of the following is not a resonance structure of the others?



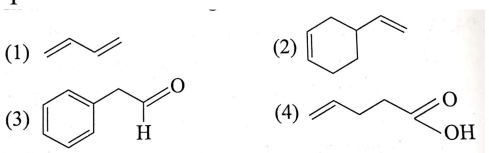
31. Match the following Lists.

List-1	List-II
(P) -M effect	(1) $-NO_2$
(Q) +M effect	(2)-O^-
(R) +1 effect	(3) $-CH_3$
(S) -I effect	(4)-CN

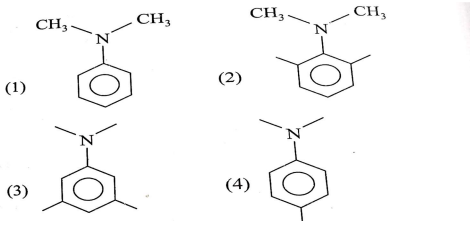
(1) P → 1, 2, 3, 4; Q → 1, 3, R → 1, 2; S → 2
(2) P → 1, 4, Q → 2, 3, R → 2, 3; S → 1, 4
(3) P → 1, Q → 1, 3, R → 3, 4; S → 3, 4
(4) P →2, 3, 4; Q → 1, 2, 3, 4; R → 3, 4, S→ 1, 2, 3

32. Resonating structures have
(a) same position of atoms
(b) different energy
(c) different number of paired and unpaired electrons
(d) differ only in position of electron and atom.

33. In which of the following mesomeric effect operates ?



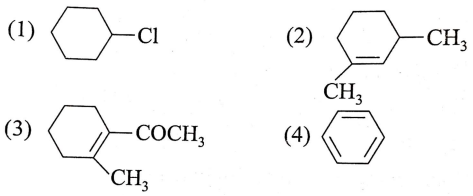
34. In which of the following l.p of of nitrogen is not involved in resonance.



35. In which of the following compound resonance doesn't take place?
(a) Benzene
(b) Cyclooctatetraene
(c) Buta-1,3-diene
(d) Naphthalene

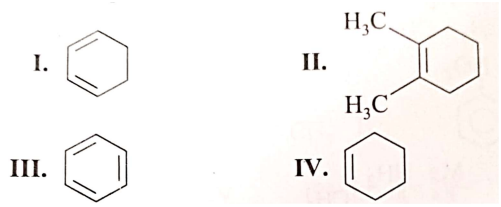
36. Hyperconjugation is best described as
(a) delocalization of π-electrons in nearby empty orbitals
(b) delocalization of σ-electrons into an adjacent p-orbital involved in π-bonding.
(c) the effect of alkyl groups donating a small amount of electron density into a nearby p-orbital
(d) delocalization of σ-electrons in nearby empty orbitals

37. In which of the following molecules all the effects namely inductive, mesomeric and hyperconjugation operate?



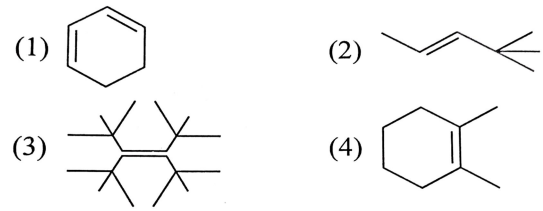
38. The stability of $Me_2C = CH_2$ is more than that of $MeCH_2CH=CH_2$ due to
(a) Inductive effect of the Me group
(b) Resonance effect of the Me group
(c) Hyperconjugative effect of the Me group
(d) Resonance as well as inductive effect of the Me group

39. The decreasing order of bond length of C=C bond in the following compounds is:



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

40. Which of the following will show maximum hyper conjugation?



41. Which of the following species is paramagnetic in nature?
(a) Free radical
(b) Carbonium ion

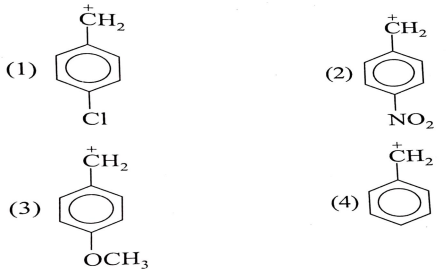
(c) Carbanion
(d) All the above

42. Which of the following free radicals is most stable?
(a) Primary
(b) Methyl
(c) Secondary
(d) Tertiary

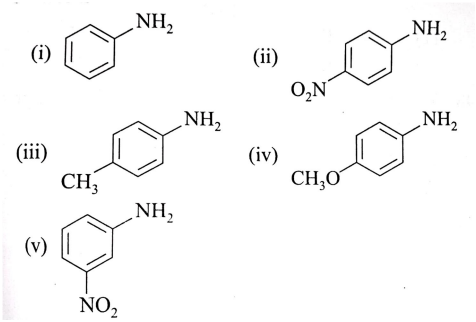
43. Which of the following is an electrophile?
(a) H_2O
(b) SO_3
(c) NH_3
(d) ROR

44. Which of the following is correct for nucleophile?
(a) A nucleophile contains an unpaired electron.
(b) It has only two lone pairs of electrons.
(c) It has an overall positive charge.
(d) It has tendency to gain electron pair.

45. Most stable carbocation is :

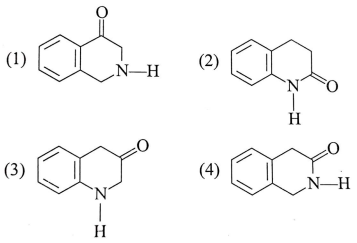


46. The correct order of increasing basic nature of the following bases is

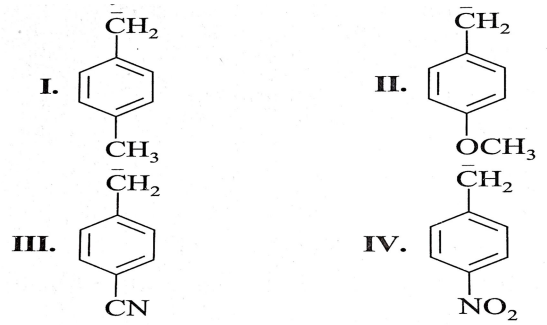


(a) (ii) < (v) < (i) < (iii) < (iv)
(b) (v) < (ii) < (i) < (iii) < (iv)
(c) (ii) < (v) < (i) < (iv) < (iii)
(d) (v) < (ii) < (i) < (iv) < (iii)

47. Which of the following compound is the strongest base?

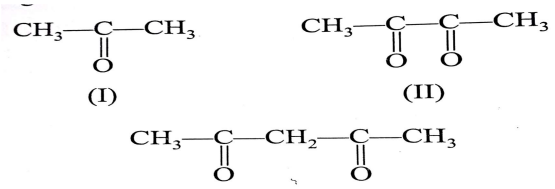


48. Arrange the following carbanions in decreasing order of stability



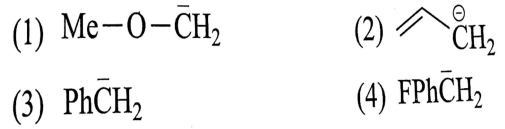
(a) IV > III > I >II
(b) III > IV > II > I
(c) I > III > II > IV
(d) II > I > III > IV

49. Arrange the following compound for their acidic strength order:



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

50. Which of the following is the most stable?



BIOLOGY

1. The best material for the study of structure of cell membrane is-
(a) RBC of human
(b) RBC of frog
(c) Kidney cell
(d) Muscle cell

2. Who proposed the fluid mosaic model of plasma membrane in 1972?
(a) Singer and Nicolson
(b) Robertson
(c) Robert brown
(d) Camillo Golgi

3. According to the fluid mosaic model of the cell
(a) In a continuous layer over the outer surface of the membrane only
(b) In a continuous layer over the inner surface only
(c) In discontinuous arrangement, both on the surface (as peripheral proteins) and in the interior of the membrane (as integral proteins)
(d) In the middle of the membrane, between the lipid layers only

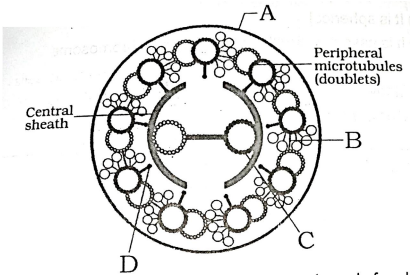
4. According to the modern concept, cell membrane is -
(a) Solid
(b) Quasifluid
(c) Fluid
(d) Solidified sheath
5. Plasma membrane is –
(a) Semipermeable
(b) Permeable
(c) Selective/ differentially permeable
(d) Impermeable
6. Which one is false about osmosis?
(a) It is a specific from of diffusion
(b)It refers to the movement of water along its concentration gradient
(c) It is a passive movement of water
(d) It occurs through a carrier protein and needs ATP
7. Choose the correct statement -
(a) The secondary cell wall forms when the growth of cell stops
(b) The secondary wall is inextensible
(c) Plasmodesmata consists of a fine pore / canal in the cell wall and middle lamella. It is a cytoplasmic bridge among neighbouring cells
(d) All
8. ER, GB, lysosome and vacuoles are components of endomembranous system because -
(a) Their structures are distinct
(b) Their functions are distinct
(c) Their functions are coordinated
(d) All
9. Endoplasmic reticulum is called RER when it has _____ on its surface-
(a) Elementary particles
(b) Ribosomes
(c) Oxysome
(d) Quantasomes
10. A cell which is very active in the synthesis and secretion of proteins, would be expected to have-
(a) Equal amount of RER and SER
(b) More SER than RER
(c) More RER than SES
(d) More GB and no RER
11. Which of the following is the correct sequence / route of the secretory product?
(a) ER →Vesicles→ Cis region of GB →Trans region of GB→ Vesicle →Plasma membrane
(b) RER→GB→ Lysosome→ Nuclear membrane →Plasma membrane
(c) ER→Vesicles →Trans region of GB→ Cis region of GB →Vesicles →Plasma membrane
(d) Lysosome →ER →GB→ Vesicles → Cell membrane
12. Which one is the important site of synthesis of glycoprotein and glycolipid?
(a) GB
(b) RER
(c) Lysosome
(d) None
13. Which one is correct-
(a) IN Amoeba, Contractile vacuole is important for excretion and osmoregulation
(b) In many cells as in protists, food vacuoles are formed by engulfing the food particles
(c) Both a and b
(d) Vacuole is always large sized in all cells of plant
14. Which of the following statement is incorrect?
(a) Mitochondria, unless specifically stained are not easily visible under the microscope
(b) Physiological activity of cells determines the number of mitochondria per cell
(c) Mitochondrion, a power house of cell has DNA, RNA, ribosomes and enzyme. So it can survive outside the cell
(d) Mitochondria divide by fission
15. The matrix of which cell organelle has single circular DNA molecule a few RNA, 70S ribosomes and components required for protein synthesis and aerobic respiration-
(a) Chioroplast
(b) Golgi Body
(c) Mitochondria
(d) ER
16. Chloroplasts contain -
(a) All types of pigments
(b) Chl+ Carotene + anthocyanine
(c) Chl + Carotenoids
(d) Only chl
17. Carotenoids-
(a) Are fat soluble pigments
(b) Include carotene (orange) and xanthophyll (yellow) pigment
(c) Are present in both chloroplasts and chromoplasts
(d) All
18. In chloroplast, chlorophyll is present in –
(a) thylakoid
(b) Stroma
(c) Outer membrane
(d) inner membrane of envelope
19. 70S ribosomes are found
(a)In prokaryotic cells mitochondria and chloroplast

(b) In prokaryotic cells and in cytoplasm of eukaryotic cells
(c) On Endoplasmic reticulum
(d) On Endoplasmic reticulum and Nuclear membrane

20. Who discovered ribosomes as dense particles under theelectron microscope?
(a) George palade
(b) Kolliker
(c) Boveri
(d) Strasburger

21. An organelle with an internal cross section showing characteristic "9+2"morphology is the
(a) Microtubule
(b) Microfilament
(c) Cilium or flagellum
(d) Cytoskeleton

22. Go through the section of cilia /flagella the different parts-



In which of the following options correct words for all the four blanks A, B, C, and D are indicated?
(a) A - Plasma membrane B-Interdoublet bridge, C - Central microtubule, D-Radial spoke
(b) A-Plasma membrane. B-Arm, C - Central microtubule D-Radial spoke
(c) A-Plasma membrane, B - Interdoublet bridge, C-Hub, D-Radial spoke
(d) A-Plasma membrane, B - Interdoublet bridge, C-Hub, D-Arm

23. Which of the following sequence is correct?
(a) Basal body →Cilium / flagellum →Centriole
(b) Cilium / flagellum→ Basal body → Centriole
(c) Centriole →Basal body → Cilium / Flagellum
(d) Basal body → Centriole Flagellum / Cilium

24. Chromatin consists of -
(a) DNA only
(b) DNA+ Histones
(c) DNA + RNA + histones + Non-histones
(d) Ribonucleoproteins only

25. Part of chromosome after secondary constriction is called -
(a) Chromomere
(b) Telomere
(c) Satellite
(d) Primary constriction

26. Important site for formation of glycoproteins and glycolipids is
(a) Lysosome
(b) Vacuole
(c) Golgi apparatus
(d) Plastid

27. Kinetochrore is
(a) Granule within centromere
(b)Surface of centromere
(c) Constriction near chromosomal end
(d) Kinetin

28. How many microtules are present in a cilium /flagellum?
(a) 20
(b) 11
(c) 9
(d) 1

29. All the following statements are true regarding the 'Cell Theory' except –
(a) All living things or organisms are made of cells.
(b) All cells arise spontaneously
(c) Cell is the basic structural and functional unit of life
(d) All cells arise from pre-existing cells

30. Water soluble pigments found in plant cell vacuoles are:-
(a) Xanthophylls
(b) Chlorophylls
(c) Carotenoids
(d) Anthocyanins

31. The products of mitosis are
(a) Orne nucleus containing twice as much DNA as the parent nucleus
(b) Two genetically identical cells
(c) Four nuclei containing hall as much DNA as the parent nucleus
(d) Two genetically identical nuclei

32. Centrosomes are
(a) Constricted regions of phase chromosomes
(b) Regions where microtubules polymerise
(c) The central region of the same cell
(d) Part of cilia

33. When dividing cells are examined under a light microscope, chromosomes first become visible during-
(a) Interphase
(b) The S Plase
(c) Proptiase
(d) G_1

34. DNA replication occurs-
(a) During both mitosis and meiosis
(b) Only during mitosis
(c) Only during meiosis

(d) During the S phase

35. Mature nerve cells are incapable of cell division These cells are probably in-

(a) G_1 phase
(b) The S pliase
(c) G_2 phase
(d) Mitosis

36. Meiosis can occur-

(a) in all organism
(b) Only when an organism is diploid
(c) Only in multicellular organismms
(d) Only in haploid organismis

37. The exchange of genetic material between chromatids and homologous chromosomes occurs during-

(a) Interphase
(b)Mitosis and meiosis
(c) Prophase I
(d) Anaphase I

38. Chromosomes decondense in to diffuse chromatin-

(a) At the end of telophase
(b) At the beginning of prophase
(c) At the end of interphase
(d) At the end of metaphase

39. Genetic recombination occurs during-

(a) Prophase of meiosis I
(b) Interphase preceding meiosis II
(c) Mitotic telophase
(d) Fertilization

40. During mitotic anaphase chromatids migrate-

(a) From the metaphase plate towards the pole
(b) Towards the nuclear envelope
(c) Along with their sister chromatids toward one pole
(d) Along with the other member of the homologous pair toward the metaphase plate

41. Which event is not associated with prophase I ?

(a) Synizesis
(b) Synapsis
(c) Segregation
(d) Terminalization

42. Yeast cell divides once in approximately every-

(a) 90 minutes
(b) 9 minutes
(c) 24 hours
(d) 24 days

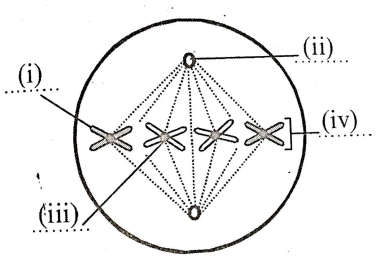
43. At metaphase of mitosis each chromosome consists of _____ chromatid(s)_____ centromere(s)_____ kinetochore(s) and _____ molecules of DNA-

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

44. Synatonemal complex is more visible at

(a) Zygotene
(b)Pachytene
(c) Diplotene
(d) Leptotene

45. Label the structure indicated by lines (i),(ii),(iii) and (iv) –



(a) (i)- Chromatid (ii)- Centriole (iii)- Centromere, (iv)- Chromosome
(b) (i)- Chromosome (ii)- Centriole (iii)- Centromere (iv)- Chromatid
(c) (i)- Chromatid (ii)- Centromere (iii)- Centriole (iv)- Chromosome
(d) (i)- Chromosome (ii)- Centromere (iii)- Centriole (iv)- Chromatid

SECTION B

46. Which of the following statements is false?"

(a)Erythrocytes /RBC are the least abundant of all the cells in blood
(b) Thenumber of RBCs in adult man per mm^3 of blood is million to 5.5 million
(c) RBC are formed in the red bone marrow in the adults
(d) RBC are enucleate in most of the mammals

47. Mammalian RBCs are _____ in shape---

(a) Oval
(b) Biconvex
(c) Biconcave
(d) Sickle like

48. All of the following are granulocytes except-

(a) Nautrophils
(b) Eosinophils
(c) Basophils Only
(d) Lymphocytes and monocytes

49. ABO blood grouping based on the presence or absence of_____ surface antigens

(a) 2
(b) 3
(c) 6
(d) 12

50. In developing foetus erythroblastosis foetalis is caused by-

(a) Haemolysis

(b) Clumping of RBCs
(c) Failure of blood clotting
(d) Phagocytosis by WBC

51. Which of the following is expected if husband is Rh^+ and Wife is Rh^-?
(a) No problem with 1 st pregnancy
(b) Problem would be expected with future pregnancies
(c) Both
(d) No problem could be expected in any pregnancy

52. What is the correct order of these events?
(1) Conversion of fibrinogen to fibrin
(2) Clot retraction and leakage of serum
(3) Thromboplastin formation
(4) Conversion of prothrombia to thrombin
(a) 3,2,1,4 (b) 3,4,1,2
(c) 3,4,2,1 (d) 4,1,3,2

53. Open circulatory system is found in
(a) Arthopods and molluscs
(b) Annelids and chordates
(c) Annelids and arthopods
(d) Fishes and molluscs

54. Incomplete double circulation is found in which of the following animals?
(a) Birds (b) Mammals
(c) Birds & Mammals
(d) Amphibians and Reptiles

55. Bicuspid value /mitral value is found between-
(a) Left atrium and left ventricle
(b) Right atrium and right ventricle
(c) Right atrium and left ventricle
(d) Left atrium and right ventricle

56. Chordae tendinae are found in-
(a) Joints
(b) Atria of heart
(c) Ventricles of heart
(d) Ventricles of brain

57. Which of the following has thickest wall?
(a) Left auricle
(b) Left ventricle
(c) Right auricle
(d) Right ventricle

58. Origin of heart beat and its conduction is represented by-
(a) SA-node→ Purkinje fibres→ AV − node → Bundle of his
(b) AV − node → Bundle of his → SA-node→ Purkinje fibres
(c) Purkinje fibres→ AV − node → SA-node→ Bundle of his
(d) SA-node→ AV − node → Bundle of his → Purkinje fibres

59. Heart of heart is
(a) SA-node
(b) AV − node
(c) Bundle of his
(d) Purkinje fibres

60. S A Node is called pace marker of the heart .Why?
(a) It can change contractile activity generated by AV node
(b) It delays the transmission of impulse between the atria and ventricles
(c) It get stimulated when it receives neural signal
(d) It initiates and maintains the rhythmic contractile activity if heart

61. The duration of cardiac cycle in a normal man is
(a) 0.8 second
(b) 80 second
(c) 60 second
(d) 72 second

62. During systole of heart
(a) Only atria contract
(b) Only ventricles contract
(c) Auricles and ventricles contract separately
(d) Auricles and ventricles contract simultaneously

63. Contraction of right ventricle pumps blood into
(a) Dorsal aorta
(b) Pulmonary vein
(c) Coronary artery
(d) Pulmonary artery

64. The amount of blood to be pumed out by each ventricle /Minute is-
(a) Stroke volume
(b) Cardiac output
(c) Tidal volume
(d)Residual volume

65. First cardiac sound(lub) is associated with-
(a) Closure of tricuspid and bicuspid valves
(b) Opening of tricuspid and bicuspid valves
(c) Closure of semilunar valves
(d) Opening of semilunar valves

66. Which of the following statement is wrong for second cardiac sound?
(a) It is heard as dup
(b) It is produced due to closure of semilunar valves
(c) It is clinically significant

(d) It is clinically non significant

67. Systemic circulation –
(a) Provides nutrient,O_2 and other essential substances to the tissues
(b) Takes CO_2 and other harmful substances away for elimination
(c) Both a and b
(d) Carries blood from heart to lungs

68. Cardiac centre lies in
(a) Medulla oblongata
(b) Pons
(c) Cerebrum
(d) Epithalamus

69. Which one indicates B.P or hypertension?
(a) 120/80 mmHg
(b) 80/120 mmHg
(c) 140/90 mmHg or higher
(d) 40/60 mmH

70. It is often referred as atherosclerosis affects the blood vessels that supply blood to the heart muscles. It is caused by deposition of Ca ,fat cholesterol and fibrous tissues making the lumen of arteries narrow-
The above facts are related to
(a) CAD
(b) SCID
(c) Blue baby
(d) Heart arrest

71. Arteries are best defined as the vessels which
(a) Carry blood from one visceral organ to another visceral organ
(b) Supply oxygenated blood to the different organs
(c) Carry blood away from the heart to different organs
(d) Break up into capillaries which reunite to form a vein

72. Which one of the following plasma proteins in involved in the coagulation of blood?
(a) Fibrinogen
(b) An albumin
(c) Serum amylase
(d) A globulin

73. Hepatic portal system carries
(a) Oxygenated blood from liver to intestine
(b) Deoxygenated blood from liver to intestine
(c) Oxygenated blood from intestine to liver
(d) Deoxygenated blood from intestine to liver

74. The mitral valve is on the same side of the heart as the_____
(a) Superior vena cava
(b) tricuspid valve
(c) pulmonary semilunar valve
(d) aortic semilunar valve

75. The tricuspid value prevents the backflow of the heart as the_____
(a) right ventricle to the right atrium
(b) left ventricle to the left atrium
(c) Pulmonary trunk to the right ventricle
(d) right atrium into the left atrium

76. The cardiac cycle includes all of the following events EXCEPT
(a) the closing and opening of the heart valves during each heart beat
(b) the movement of impulse from the SA node to all regions of the heart wall
(c) the number of times the heart beats in one minute
(d) the changes in blood volume in all chambers of the heart

77. Which one of the following human organs is often called the graveyard of RBCs ?
(a) Gall bladder
(b) Kidney
(c) Spleen
(d) Liver

78. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one docke al once offers his blood What was the blood group of the donor?
(a) Blood group B.
(b) Blood group AB
(c) Blood group O
(d) Blood group A

79. The second heart sound (dub) is associated with the closure of
(a) Tricuspid valve
(b) Semilunar valves
(c) Bicuspid valve
(d) Tricuspid and bicuspid valves

80. What would be the cardiac output of a person having 72 heart beats per minute and a stroke volume of 50 ml?
(a) 360ml
(b) 3600 ml
(c) 7200ml
(d)5000ml

81. Approximately seventy percent of carbon-dioxide absorbed by the biood will be transported to the lungs

(a) as bicarbonate ions
(b) in the form of dissolved gas molecules
(c) by binding to R.B.C
(d) as carbamino – haemoglobin

82. Which blood cells can engulf bacteria by phagocytosis?
(a) Eosinophil and Basophil
(b) Basophil and Lymphocyte
(c) Neutrophil and Monocyte
(d) Neutrophil and Lymphocyte

83. Which of the following disorders of circulatory system is not correctly stated?
(a) Hypertension - a sustained high blood pressure of 140/90 or above
(b) CAD - The lumen of coronary arteries become narrower due to deposits of calcium, fat, cholesterol and fibrous tissue
(c) Angina - Acute chest pain appears when heart muscle is suddenly damaged by inadequate blood supply, because of blockage
(d) Heart failure - Usually called congestive heart failure because congestion of lungs is one of the main symptoms of the disease

84. Heaviness with severe chest pain which may disappear with rest indicates
(a) Angina pectoris
(b) Atherosclerosis
(c) Arteriosclerosis
(d) Hyperthyroidism

85. Which chamber of the heart shows the greatest pressure changes during one cardiac cycle?
(a) Left atrium
(b) Left ventricle
(c) Right atrum
(d) Right ventricle

86. Which one of the following animals has two separate circulatory pathways?
(a) Whale
(b) Shark
(c) Frog
(d) Lizard

87. Most common blood group is
(a) AB (b) A
(c) B (d) O

88. Blood vessel carrying least CO_2 is
(a) Pulmonary vein
(b) Pulmonary artery
(c) Vena cava
(d) Hepatic vein

89. Middle man of the body is
(a) Plasma
(b) Lymph
(c) WBC
(d) RBC

90. Valves occur in
(a) Arteries ,veins and auricles
(b) Atria, ventricles and veins
(c) Arteries ,veins and ventricles
(d) SA mode AV node and veins.