



Studymate Foundation Paper

Date : 20/01/2019		Physics, (CLASS				
Du Ma	ration : 90 Min. x. Marks : 90		(Set-2)				XI
Gen 1. 2. 3. 4. 5. 6. 7.	All questions are conserved and the second s	: ompulsory. lotted ONE mark for a the total score will be correct response fo sponse. s 90 questions (Physic students attempt Phy s not allowed.	each correct i e made if no r r each questio cs 1-30, Chen ysics, Chemis	response. esponse is indica on. Filling up M(nistry 31-60, Mat rry and Mathema	ted for the ques DRE THAN C hematics 61-90 tics and MEDI	tion in the answer O NE response in 6 / Biology 61-90). CAL Students att	sheet. each question will be empt Physics, Chemistry
				Physics			
1.	The units for	$\frac{\mathrm{G}}{g}$ will be :					
	(A) m^2/kg	(B) 1	kg/m	(C)	kg/m^2	(D)	m/kg
2.	A wooden blo <i>l</i> and h are sl	ck with a coin p nown there. Aft	laced on i er some t	ts top, floats ime, the coin	in water as n falls into	shown in fig the water. Th	ure. The distances nen.
				coin l h			
	(A) <i>l</i> decrease	es and h increa	ises	(B)	<i>l</i> increases	s and h decr	eases
	(C) both <i>l</i> and	d h decreases		(D)	both <i>l</i> and	h increases	
3.	For a projecti	le thrown into s	space with	n a speed v,	the horizon	tal range is	$\frac{\sqrt{3}v^2}{2g}$. The vertical
	range is $\frac{v^2}{8g}$.	The angle which	ch the pro	ojectile mak	es with the	horizontal in	nitially is
	(A) 15°	(B) (30°	(C)	45°	(D)	60°
4.	A body is mo moved by the	ved along a stra body in time t i	aight line s proporti	by a machin onal to	e delivering	g constant po	ower. The distance
	(A) $t^{1/2}$	(B) 1	t ^{3/4}	(C)	t ^{3/2}	(D)	t^2

STUDY mate

5. A thin rod of length L and mass M is bent at the middle point O at an angle of 60°, as shown in figure. The moment of inertia of the rod about an axis passing through O and perpendicular to the plane of the rod will be



6. Four speed-time graphs are given below. Which graph represents the case of a trolley decelerating to a constant speed and then accelerating uniformly.



7. A horizontal force of 10 N is necessary to just hold a block stationary against a wall. The coefficient of friction between the block and wall is 0.2. The weight of the block is



8. The escape velocity from a spherical planet is v_0 . What is the escape velocity corresponding to another planet of twice the radius and half the mean density.

(A)
$$\sqrt{2} v_0$$
 (B) $\frac{v_0}{\sqrt{2}}$ (C) v_0 (D) $4 v_0$

9. Figure shows two processes A and B on a system. Let ΔQ_1 and ΔQ_2 be the heat given to the system in processes A and B respectively. Then



- **10.** Angular momentum vector \vec{l} for a particle under projectile motion about the point of projection is
 - (A) constant in magnitude and direction both
 - (B) constant in direction, variable in magnitude
 - (C) constant in magnitude, variable in direction
 - (D) variable in magnitude and direction both
- **11.** A particle moves in a circular path with a uniform speed. Its motion is
 - (A) periodic (B) oscillatory
 - (C) simple harmonic (D) angular simple harmonic

12. What is the % error in measurement of 'T' of a pendulum if maximum errors in measurements of length and 'g' are 2% and 4% respectively?

(A) 6% (B) 3% (C) 4% (D) 5%

- 13. The ratio of diameters of two wires of same material is n : 1. The length of each wire is 4m. On applying the same load, the increase in length of thin wire will be (n > 1)... to the length of thee thick wire.
 - (A) n^2 times (B) n times (C) 2n times (D) (2n + 1) times
- **14.** A liquid flows steadily from left to right in a tube of uniform cross-section. If a_1 and a_2 are the cross-sectional areas of portions A and B of the tube, the ratio of velocities of liquid at A and B is given by



- **15.** A particle performs SHM along a path, 2A = 20 cm (where A is the amplitude). If maximum velocity is 1 m/s, the time period of the particle is
 - (A) $2\pi \sec$ (B) $\pi/2 \sec$ (C) $\pi/5 \sec$ (D) $5\pi \sec$
- **16.** A block of ice at -10°C is slowly heated and converted to steam at 100°C. Which of the following curve represents the phenomenon qualitatively?



17. A particle of mass 0.1 kg is subjected to a force which varies with distance as shown in figure. If it starts its journey from rest at x = 0, its velocity at x = 12 m is



18. A stone is dropped into a well. If the depth of water below the top be h and velocity of sound in air be v, then the time after which splash of sound is heard is

(A)
$$\sqrt{\frac{2h}{g}} + \frac{h}{v}$$
 (B) $\sqrt{\frac{2h}{g}} - \frac{h}{v}$ (C) $\sqrt{\frac{2h}{g}}$ (D) $\sqrt{\frac{2h}{g}} \times \frac{h}{v}$

19. A man can swim in still water with the velocity of 5 km/h when the water of the river is flowing with the velocity of 3 km/h. In order to cross the river in shortest distance, the angle θ with the bank of the river will be

(A)
$$\theta = \cos^{-1}(5/3)$$
 (B) $\theta = \cos^{-1}\left(-\frac{3}{5}\right)$ (C) $\theta = \pi/2$ (D) $\theta = \cos^{-1}(-5/3)$

STUDY mate helps excel in

(A) 2:1

20. Two identical springs, each of spring constant K, are connected in series and parallel as shown in figure. A mass m is suspended from them. The ratio of their frequencies of vertical oscillations will be



(D) 4:1

- **21.** When a particle moves in a circle with a uniform speed
 - (A) Its velocity and acceleration are both constant
 - (B) Its velocity is constant but the acceleration changes
 - (C) Its acceleration is constant but the velocity changes
 - (D) Its velocity and acceleration both change
- **22.** The heart is pumping blood at x kg per unit time, with constant velocity v. The force needed is

(A)
$$x v$$
 (B) $v \frac{dx}{dt}$ (C) $x \frac{dv}{dt}$ (D) Zero

23. A block of mass 4 kg is suspended through two light spring balance A and B. Then A and B will read respectively, as shown in the figure.



- (B) Zero kg and 4 kg (C) 4 kg and 4 kg (A) 4 kg and zero kg (D) 2 kg and 2 kg
- **24.** For a given velocity, a projectile has the same range R for two angles of projection. If t_1 and t_2 are the time of flights in the two cases, then
 - (A) $t_1 t_2 \propto \frac{1}{R^2}$ (B) $t_1 t_2 \propto \frac{1}{R}$ (C) $t_1 t_2 \propto R$ (D) $t_1 t_2 \propto R^2$ The density of water is equal to (A) $10^{-3} \text{ kg m}^{-3}$ (B) 10 kg m^{-3} (C) 10^3 kg m^{-3} (D) 10^6 kg m^{-3}

25. The density of water is equal to

- **26.** Two blocks of masses m_1 and m_2 are attached to the lower end of a light vertical spring of force constant k. The upper end of the spring is fixed. When the system is in equilibrium, the lower block (m_2) drop off. The other block (m_1) will
 - (A) Remain undisturbed
 - (B) Move up through a distance $\frac{mg}{k}$ and come to rest
 - (C) Undergo vertical SHM with a time period of $2\pi \sqrt{\frac{m_1}{k}}$
 - (D) Under vertical SHM with a time period $2\pi \sqrt{\frac{(m_1 + m_2)}{k}}$

- **27.** In stationary wave
 - (A) At node, strain is maximum
- (B) At node, velocity is maximum
- (C) At antinode, strain is maximum (D) At antinode, velocity is minimum

28. The equation of progressive wave is $y = 0.01 \sin\left(1100\pi t + \frac{10\pi x}{3}\right)$ where x is in meter and t is in second. The value of frequency is (A) 550 Hz (B) 720 Hz (C) 310 Hz (D) None of these

29. Consider a two particle system with the particles having masses m_1 and m_2 . If the first particle is pushed towards the centre of mass through a distance d, by what distance should the second particle be moved so as to keep the centre of mass at the same position?

(A)
$$\frac{m_2}{m_1}d$$
 (B) $\frac{m_1}{m_2}d$ (C) $\frac{m_1m_2}{d}$ (D) $\frac{(m_1+m_2)}{d}$

30. A non zero external force acts on a system of particles. The velocity and the acceleration of the centre of mass are found to be v_0 and a_0 at an instant t. it is possible that

(A) $v_0 = 0, a_0 = 0$ (B) $v_0 = 0, a_0 \neq 0$ (C) $v \neq 0, a \neq 0$ (D) Both (b) and (c)

Chemistry

- **31.** A substance which gives brick red flame and breaks down on heating to give oxygen and a brown gas is
 - (A) magnesium nitrate (B) calcium nitrate
 - (C) barium nitrate (D) strontium nitrate
- **32.** Boric acid is an acid because its molecule
 - (A) contains replaceable H^+ ion (B) gives up a proton
 - (C) accepts OH⁻ from water releasing proton (D) combine with protons from water molecule
- **33.** The element which exists in liquid state for a wide range of temperature and can be used for measuring high temperature is
 - (A) B (B) Al (C) Ga (D) In
- 34. Which of the following is the correct IUPAC name?
 - (A) 3-Ethyl-4,4-dimethylheptane (B) 4,4-Dimethyl-3-ethylheptane
 - (C) 5-Ethyl-4,4-dimethylheptane (D) 4,4-Bis(methyl)-3-ethylheptane
- **35.** In the hydrocarbon

 $\underset{{}_{6}}{\overset{}_{-}}\underset{{}_{5}}{\overset{}_{-}}\underset{{}_{4}}{\overset{}_{-}}\underset{{}_{3}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}{\overset{}_{-}}\underset{{}_{1}}{\overset{}_{-}}\underset{{}_{2}}}$

The state of hybridisation of carbon 1, 3 and 5 are in the following sequence.

(A) sp, sp^2, sp^3 (B) sp^3, sp^2, sp (C) sp^2, sp, sp^3 (D) sp, sp^3, sp^2

36. E⁰ values of some redox couple are given below. On the basis of these values, choose the correct option.

 E^{0} values: $Br_{2}/Br^{-} = +1.09$; $Ag^{+}/Ag = +0.80$; $Cu^{2+}/Cu = +0.34$; $I_{2}/I^{-} = +0.54$

- (A) Cu will reduce Br⁻ (B) Cu will reduce Ag
- (C) Cu will reduce I⁻ (D) Cu will reduce Br_2



- (C) $CH_4(g) + O_2(g) \longrightarrow C(s) + 2H_2O(1)$
- (D) $CH_4(g) + 2O_2(g) \longrightarrow CO_2(g) + 2H_2O(1)$

48.	The alkene that exhibit geometrical isomerism is						
	(A) Propene	(B)	2-Methylpropene	(C)	But-2-ene	(D)	2-Methylbut-2-ene
49.	In the reaction below,	X is					
	Neopentyl alcohol —	2SO4	→ X				
	(A) 2-Methylpentane			(B)	2-Methylpent-2-e	ene	
	(C) 2-Methylbut-2-ene	:		(D)	Neopentane		
50.	Which of the following	gase	es is not a greenho	use g	jas?		
	(A) CO	(B)	O ₃	(C)	CH ₄	(D)	$\rm H_2O$ vapour
51.	The density of a gas A is of B. The ratio of the pa	is tw artia	ice that of gas B. M l pressure of A and	olecı B	ılar mass of A is ha	alf of	the molecular mass
	(A) 1/4	(B)	1/2	(C)	4/1	(D)	2/1
52.	The enthalpies of con -283 kJ mol ⁻¹ respectiv	nbus vely.	stion of carbon an The enthalpy of fo	id ca rmat	rbon monoxide a ion of carbon mone	re –3 oxide	893.5 kJ mol ⁻¹ and e per mole is
	(A) –676.5 kJ	(B)	676.5 kJ	(C)	110.5 kJ	(D)	–110.5 kJ
53.	For a reaction,						
	$2NH_3(g) \longrightarrow N_2(g) +$	3H ₂	(g)				
	Which of the following	stat	ements is correct?				
	(A) $\Delta H = \Delta U$	(B)	$\Delta H < \Delta U$	(C)	$\Delta H > \Delta U$	(D)	$\Delta H = O$
54.	For the reaction						
	$PCl_{3}(g) + Cl_{2}(g) \rightleftharpoons PC$	$l_{5}(g)$					
	the value of $k_{_{\rm c}}$ at 250°	C is	26 L mol ⁻¹ . The val	ue of	\mathbf{k}_{p} at the same ter	mper	ature will be
	(A) 0.61 atm^{-1}	(B)	0.57 atm^{-1}	(C)	$0.83 atm^{-1}$	(D)	$0.46 atm^{-1}$
55.	Which is the correct re	pres	entation for the sol	lubili	ty product constar	nt of A	Ag ₂ CrO ₄ ?
	(A) $\left[Ag^{+} \right]^{2} \left[CrO_{4}^{2-} \right]$	(B)	$\left[2Ag^{\scriptscriptstyle +}\right]\left[CrO_4^{2-}\right]$	(C)	$\left[2Ag^{\scriptscriptstyle +}\right]\left[CrO_4^{2\scriptscriptstyle -}\right]$	(D)	$\left[2Ag^{\scriptscriptstyle +}\right]^{\!2}\!\left[CrO_4^{^{2-}}\right]$
56.	Among halogens, the o	corre	ct order of amount	ofer	nergy released in e	lectr	on gain enthalpy:
	(A) $F > Cl > Br > I$	(B)	F < Cl < Br < I	(C)	F < Cl > Br > I	(D)	F < Cl < Br < I
57.	Electronic configuration	ons o	of four elements (i),	(ii),	(iii) and (iv) are giv	en b	elow:
	(i) $1s^2 2s^2 2p^6$	(ii)	$1s^2 2s^2 2p^4$	(iii)	$1s^2 2s^2 2p^6 3s^1$	(iv)	$1s^2 2s^2 2p^5$
	Which of the following	is th	ne correct order of i	incre	asing tendency to	gain	electron:
	(A) (i) < (iii) < (ii) < (iv)			(B)	(i) < (ii) < (iii) < (iii) < (iii)	v)	
EO	(C) $(1V) < (11) < (111) < (11)$	lina	n ³ d hybridication.	(D)	(1V) < (1) < (11) < (11)	1)	
58.		(B)	a a a a a a a a a a a a a a a a a a a	(\mathbf{C})	d	(D)	d
	(7) $u_{x^2-y^2}$	(ப)		(0)	$\mathbf{u}_{\mathbf{z}^2}$	(D)	u _{zx}
59.	(A) D in DC1	nosp (D)	norous in $POCI_3$ is	the s	cl in CIE	(D)	D in DC1
60	(A) $P \text{ III } P \text{CI}_3$	(B) o otr	$S III SF_4$	(C)	$CI III CIF_3$	(D)	$B III B CI_3$
00.	temperature is increas	ed to	o 177°C and pressure	, a g ire to	1.5 bar, the corres	spon	ding volume will be:
	(A) V mL	(B)	2V mL	(C)	V/2 mL	(D)	V/3 mL

FOR NON-MEDICAL STUDENTS ONLY

Mathematics

61.	The value of cos 1° cos 2° cos 3° cos 179° is							
	(A)	$\frac{1}{\sqrt{2}}$	(B)	0	(C)	1	(D)	-1
62.	Whi	ch of the following	g is c	orrect?				
	(A)	sin 1° > sin 1	(B)	sin 1° < sin 1	(C)	sin 1° = sin 1	(D)	$\sin 1^\circ = \frac{\pi}{18^\circ} \sin 1$
63.	sin :	$x + i \cos 2x$ and co	s x-	$i \sin 2x$ are conjuga	ate to	each other for:		
	(A)	$x = n\pi$	(B)	x = 0	(C)	$x = \left(n + \frac{1}{2}\right)\frac{\pi}{2}$	(D)	No value of <i>x</i>
64.	If <i>f</i>	$(z) = rac{7-z}{1-z^2}$, where	z = 1	1 + 2 <i>i</i> , then <i>f</i> (z) is	5			
	(A)	$\frac{ z }{2}$	(B)	z	(C)	2 z	(D)	none of these.
6 5.	If $\left(\frac{1}{1}\right)$	$\left(\frac{1+i}{1-i}\right)^x = 1$, then						
	(A)	x = 2n + 1			(B)	<i>x</i> = 4 <i>n</i>		
	(C)	x = 2n			(D)	x = 4n + 1, where	$n \in \mathbb{R}$	Ν
66.	Eacl	h set X _r contains S	5 ele	ments and each set	Y _r co	ontains 2 elements	s and	$\prod_{r=1}^{20} X_r = S = \bigcup_{r=1}^{n} Y_r$. If
	eacł	n element of S belo	ong t	o exactly 10 of the 2	X _r 's a	nd to exactly 4 of 1	the Y	I_r 's, then <i>n</i> is
	(A)	10	(B)	20	(C)	100	(D)	50
67.	Let sof po a sq	S = set of points in oints inside the cir juare. Then	side rcle.	the square, T = the If the triangle and c	set o ircle	f points inside the intersect each oth	triar er ar	ngle and C = the set nd are contained in
	(A)	$S \ \cap \ T \ \cap \ C = \phi$	(B)	$S \cup T \cup C = C$	(C)	$S \cup T \cup C = S$	(D)	$S ~\cup~ T = S ~\cap~ C$
68.	Ran	ge of $f(x) = \frac{1}{1 - 2cc}$	$\overline{\text{os }x}$	is				
	(A)	$\left[\frac{1}{3},1\right]$	(B)	$\left[-1,\frac{1}{3}\right]$	(C)	$(-\infty, -1] \cup \left[\frac{1}{3}, \infty\right)$	(D)	$\left[-\frac{1}{3},1\right]$
69.	The domain of the function f given by $f(x) = \frac{x^2 + 2x + 1}{x^2 - x - 6}$							
	(A)	$R - \{3, -2\}$	(B)	$R - \{-3, 2\}$	(C)	R – [3, – 2]	(D)	R – (3, – 2)
70.	If ta	n $\theta = \frac{1}{2}$ and $\tan \phi$	$=\frac{1}{3}$,	then the value of θ	+¢is			

71.	If <i>x</i> , 2 <i>y</i> , 3 <i>z</i> are in A.P., where the distinct numbers x, y, z are in G.P. then the common ratio of the G.P. is						
	(A) 3	(B) $\frac{1}{3}$	(C) 2	(D) $\frac{1}{2}$			
72.	The third term of G.P.	is 4. The product of its	first 5 terms is				
	(A) 4	(B) 4 ⁴	(C) 4 ⁵	(D) None of these			
73.	The equations of the	lines passing through t	the point (1, 0) and at	a distance $\frac{\sqrt{3}}{2}$ from the			
	(A) $\sqrt{3x+y}-\sqrt{3}=0$,	$\sqrt{3x-y}-\sqrt{3}=0$	(B) $\sqrt{3x+y}+\sqrt{3}=0,$	$\sqrt{3x} - y + \sqrt{3} = 0$			
	(C) $x + \sqrt{3}y - \sqrt{3} = 0$	$x - \sqrt{3}y - \sqrt{3} = 0$	(D) None of these.				
74.	Equations of diagonal	s of the square formed h	by the lines $x = 0, y = 0$,	<i>x</i> = 1 and <i>y</i> = 1 are			
	(A) $y = x, y + x = 1$	(B) $y = x, x + y = 2$	(C) $2y = x, y + x = \frac{1}{3}$	(D) $y = 2x, y + 2x = 1$			
75.	The distance between	the foci of a hyperbola i	is 16 and its eccentricit	ty is $\sqrt{2}$. Its equation is			
	(A) $x^2 - y^2 = 32$	(B) $\frac{x^2}{4} - \frac{y^2}{9} = 1$	(C) $2x - 3y^2 = 7$	(D) none of these			
76.	If $ x+2 \le 9$, then						
	(A) $x \in (-7, 11)$		(B) $x \in [-11, 7]$				
	(C) $x \in (-\infty, -7) \cup (1$	1, ∞)	(D) $x \in (-\infty, -7) \cup [11]$	1,∞)			
77.	The sum of the digits taken all at a time is	in unit place of all the	numbers formed with t	he help of 3, 4, 5 and 6			
	(A) 432	(B) 108	(C) 36	(D) 18			
78.	The number of ways i that the committee in	n which we can choose cludes at least two mer	a committee from four and exactly twice as a	men and six women so many women as men is			
	(A) 94	(B) 126	(C) 128	(D) None			
79.	The two successive te are	rms in the expansion of	f $(1 + x)^{24}$ whose coeffici	ents are in the ratio 1:4			
	(A) $3^{\rm rd}$ and $4^{\rm th}$	(B) 4^{th} and 5^{th}	(C) 5^{th} and 6^{th}	(D) 6^{th} and 7^{th}			
80.	The coefficient of x^n in	n the expansion of (1 + 2	$(x)^{2n}$ and $(1 + x)^{2n-1}$ are is	n the ratio.			
	(A) 1:2	(B) 1:3	(C) 3:1	(D) 2:1			
81.	$\lim_{x \to 0} \frac{\sin x}{\sqrt{x+1} - \sqrt{1-x}}$ is						
	(A) 2	(B) 0	(C) 1	(D) -1			
82.	Let a, b, c, d, e be the	observations with mean	n <i>m</i> and standard devia	tion s.			
	The standard deviation	on of the observations a	+ k, b + k, c + k, d + k, d	e + k is			
	(A) s	(B) <i>k</i> s	(C) s + k	(D) $\frac{s}{k}$			
83.	If the probabilities for A that either A or B fail	A to fail in an examinatio s is	n is 0.2 and that for B is	0.3, then the probability			
	(A) > . 5	(B) .5	(C) ≤ .5	(D) 0			

The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then $P(\overline{A}) + P(\overline{B})$ is						
0.4	(B)	0.8	(C)	1.2	(D)	1.6
ree numbers are ch	osen	from 1 to 20. Find	the j	probability that the	ey ar	re not consecutive
$\frac{186}{190}$	(B)	$\frac{187}{190}$	(C)	$\frac{188}{190}$	(D)	$\frac{18}{2^{20}C_3}$
e area of the circle o	centre	ed at (1, 2) and pas	sing	through (4, 6) is		
5π	(B)	10π	(C)	25π	(D)	none of these
s the foot of the perj e	pendi	icular drawn from a	a poi	nt (3, 4, 5) on <i>x</i> -axi	is. Tl	he coordinates of L
(3, 0, 0)	(B)	(0, 4, 0)	(C)	(0, 0, 5)	(D)	none of these
$\int_{0}^{1} \frac{\tan 2x - x}{3x - \sin x}$ is						
2	(B)	$\frac{1}{2}$	(C)	$\frac{-1}{2}$	(D)	$\frac{1}{4}$
$t f(x) = x - [x]; \in \mathbf{R}, t$	then	$f\left(\frac{1}{2}\right)$ {where $\left[\cdot\right]$ show	vs gr	eatest integer func	ction	1}
$\frac{3}{2}$	(B)	1	(C)	0	(D)	-1
$f(x) = 1 - x + x^2 - x^3$.	– x	$x^{99} + x^{100}$, then $f'(1)$ i	s equ	ial to		
150	(B)	-50	(C)	-150	(D)	50
	0.4 ree numbers are ch $\frac{186}{190}$ e area of the circle of 5π is the foot of the performance (3, 0, 0) $\frac{\tan 2x - x}{3x - \sin x}$ is 2 $f(x) = x - [x]; \in \mathbf{R}, \mathbf{R}$ $\frac{3}{2}$ $f(x) = 1 - x + x^2 - x^3$. 150	0.4 (B) recent numbers are chosen $\frac{186}{190}$ (B) e area of the circle centre 5π (B) s the foot of the perpendition (3, 0, 0) (B) $\frac{\tan 2x - x}{3x - \sin x}$ is 2 (B) $f(x) = x - [x]; \in \mathbf{R}$, then $\frac{3}{2}$ (B) $f(x) = 1 - x + x^2 - x^3 \dots - x^3$ 150 (B)	0.4 (B) 0.8 There numbers are chosen from 1 to 20. Find $\frac{186}{190}$ (B) $\frac{187}{190}$ the area of the circle centred at (1, 2) and pase 5π (B) 10π at the foot of the perpendicular drawn from a (3, 0, 0) (B) (0, 4, 0) $\frac{\tan 2x - x}{3x - \sin x}$ is 2 (B) $\frac{1}{2}$ $f(x) = x - [x]; \in \mathbf{R}$, then $f'(\frac{1}{2})$ {where [·] show $\frac{3}{2}$ (B) 1 $f(x) = 1 - x + x^2 - x^3 \dots - x^{99} + x^{100}$, then $f'(1)$ if 150 (B) -50	0.4 (B) 0.8 (C) ree numbers are chosen from 1 to 20. Find the p $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) e area of the circle centred at (1, 2) and passing 5π (B) 10π (C) s the foot of the perpendicular drawn from a point (3, 0, 0) (B) (0, 4, 0) (C) $\frac{\tan 2x - x}{3x - \sin x}$ is 2 (B) $\frac{1}{2}$ (C) $f(x) = x - [x]; \in \mathbf{R}$, then $f(\frac{1}{2})$ (where [·] shows gr $\frac{3}{2}$ (B) 1 (C) $f(x) = 1 - x + x^2 - x^3 \dots - x^{99} + x^{100}$, then $f'(1)$ is equally 150 (B) -50 (C)	0.4 (B) 0.8 (C) 1.2 there numbers are chosen from 1 to 20. Find the probability that the $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) $\frac{188}{190}$ the area of the circle centred at (1, 2) and passing through (4, 6) is 5π (B) 10π (C) 25π as the foot of the perpendicular drawn from a point (3, 4, 5) on x-axis (3, 0, 0) (B) (0, 4, 0) (C) (0, 0, 5) $\frac{4 \tan 2x - x}{3x - \sin x}$ is 2 (B) $\frac{1}{2}$ (C) $\frac{-1}{2}$ $f(x) = x - [x]; \in \mathbf{R}$, then $f'(\frac{1}{2})$ (where [·] shows greatest integer funct $\frac{3}{2}$ (B) 1 (C) 0 $f(x) = 1 - x + x^2 - x^3 \dots - x^{99} + x^{100}$, then $f'(1)$ is equal to 150 (B) -50 (C) -150	0.4 (B) 0.8 (C) 1.2 (D) there numbers are chosen from 1 to 20. Find the probability that they are $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) $\frac{188}{190}$ (D) there area of the circle centred at (1, 2) and passing through (4, 6) is 5π (B) 10π (C) 25π (D) at the foot of the perpendicular drawn from a point (3, 4, 5) on x-axis. The (3, 0, 0) (B) (0, 4, 0) (C) (0, 0, 5) (D) $\frac{1 \tan 2x - x}{3x - \sin x}$ is 2 (B) $\frac{1}{2}$ (C) $\frac{-1}{2}$ (D) $f(x) = x - [x]; \in \mathbf{R}$, then $f(\frac{1}{2})$ (where [·] shows greatest integer function $\frac{3}{2}$ (B) 1 (C) 0 (D) $f(x) = 1 - x + x^2 - x^3 \dots - x^{99} + x^{100}$, then $f'(1)$ is equal to 150 (B) -50 (C) -150 (D)

FOR MEDICAL STUDENTS ONLY

Biology

- **61.** Which of the following muscular actions will bring about inspiration during pulmonary ventilation?
 - (A) Contraction of diaphragm and contraction of external intercostal muscles.
 - (B) Contraction of diaphragm and contraction of internal intercostal muscles.
 - (C) Contraction of diaphragm and relaxation of external intercostal muscles.
 - (D) Contraction of diaphragm and relaxation of internal intercostal muscles.
- **62.** Bile produced in the liver is associated with which of the following
 - (A) Emulsification of fats into tiny globules in the small intestine.
 - (B) Digestive action of pancreatic amylase.
 - (C) Emulsification of fats into amino acids.
 - (D) Production of amino acids.
- **63.** Large amoeboid cells, that are a part of our innate immune system, found in the areolar tissue are called as
 - (A) Macrophages (B) Mast cells (C) Fibroblasts (D) Adipocytes
- 64. Connecting link of Glycolysis and kreb's cycle is
 - (A) Oxalo acetic acid

(B) Phospho enol pyruvate

(C) Acetyl's co A

(D) All of the above

65. Which statement about photosynthesis in C4 plants is NOT true? (A) The first product of carbon dioxide fixation is a compound with 4 carbon atoms. (B) C4 photosynthesis is an adaptation for plants living in hot, arid climates. (C) Carbon dioxide is initially fixed in mesophyll cells, but the Calvin cycle is active in bundle sheath cells in leaves of C4 plants. (D) Less ATP is used overall for sugar biosynthesis in C4 than C3 plants. **66.** The receptors of steroid hormones lies (B) Within the plasma membrane (A) In the cytoplasm (C) Within the nuclear membrane (D) In the blood plasma **67.** Regarding hypothalamus (I) All vertebrate brains contain a hypothalamus (II) One of the most important function of hypothalamus is to link the nervous system to the endocrine system via the pituitary gland. (III) The hypothalamus controls body temperature, hunger, thirst, fatigue and circadian cycle. Which of the following is the correct answer (A) I, II, III are correct (B) I and II are correct (C) I and III are correct (D) II and III are correct **68.** In which joint the articular surfaces are molded to each other in such a manner as to permit motion only in one plane - backward and forward - the extent of motion at the same time being considerable? (A) Gliding joint of planar joint (B) Hinge joint (C) Pivot joint (D) Condyloid joint 69. Kidneys play an important role in the maintenance of concentration of various electrolytes in body fluids. Identify the electrolyte that is not primarily regulated by kidney. (A) Phosphate (B) Potassium (C) Iron (D) Bicarbonate 70. The basic function of lymphatic system are (I) Transporting interstitial fluid back to the blood. (II) Preventing intravascular clot formation (III) Transporting fat absorbed from the small intestine to the blood. (IV) Providing lymphocytes to help in the defence against disease causing agents. Which of the following is the correct answer (C) I, III, IV (D) II, III, IV (A) I, II, III, IV (B) I, II, III 71. The hierarchical classification of species based on evolutionary ancestry is called as (A) Cladistics (B) Phenetics (C) Classical taxonomy (D) Systematics 72. The part of DNA molecule that varies among DNA molecules is its (A) Glycerol attachment (B) Nitrogenous base (C) Sugars (D) Phosphates



73.	Transfer of genetic information through tran	nsduction involves						
	(A) Conjugation							
	(B) Bacteriophage released from donor cells							
	(C) Another bacterium							
	(D) Physical contact between donor and reci	ipient strains						
74.	Which of the following is not a characteristic	c of Basidiomycetes?						
	(A) They are called as club fungi.							
	(B) Motile cells are absent							
	(C) Primary mycelium is diploid							
	(D) In secondary mycelium each cell has tw	zo nuclei.						
75.	Which of the following is not common to Fur	naria and Selaginella?						
	(A) Archegonium (B) Embryo	(C) Flagellate sperms (D) Roots						
76.	A technique of growing plants without soil in nutrient solutions rather than being continu	which plant roots are intermittently mixed with uously immersed in solution is called						
	(A) Hydroponics (B) Aeroponics	(C) Aquaporinics (D) Aquaporins						
77.	Turgor pressure is also referred to as							
	(A) Solute potential	(B) Water potential						
	(C) Pressure potential	(D) Osmotic potential						
78.	Jute of commercial importance is							
	(A) Primary phloem	(B) Secondary phloem						
	(C) Secondary xylem	(D) Primary xylem						
79.	Histones and non-histones are							
	(A) Basic proteins associated with DNA	(B) Acidic proteins associated with DNA						
	(C) Basic proteins associated with RNA	(D) Acidic proteins associated with RNA						
80.	Chiasmata formation is visible in							
	(A) Zygotene (B) Pachytene	(C) Diplotene (D) Diakinesis						
81.	An organized and differentiated cellular stru	cture having cytoplasm but no nucleus is						
	(A) vessels	(B) xylem parenchyma						
	(C) sieve tubes	(D) tracheids						
82.	Though Nitrogen is not considered a true mir of minerals because	neral, yet it is sometimes kept under the category						
	(A) It occurs in abundance in atmosphere							
	(B) It is required in large amounts by the pl	ants						
	(C) It is absorbed by plants in the form of ni	trates from the soil						
	(D) Its deficiency cannot be cured by any of	her element						
83.	ATP and NADPH are converted to ADP + Pi ar	nd NADP+ during						
	(A) The light dependent reaction	(B) The light independent reaction						

(C) Both of the above (D) None of the above

84.	Cyanide and carbon monoxide are poisons that affect oxidative phosphorylation by inhibiting:							
	(A) Electron transport chain							
	(B) Succinate dehydrogenase							
	(C) ATP synthesis							
	(D) Ionophores the	at disrupt the proton	gradient by	carrying proto	ns acros	ss a membrane.		
85.	The digestive enzy	me that is most acti	ve at pH of 2	2, is				
	(A) Salivary amyla	ase	(B)	Pancreatic an	iylase			
	(C) Pepsin		(D)	Trypsin				
86.	Both a mouth and	an anal pore (a one	way digestiv	ve system) is p	resent i	n		
	(A) Ctenophores	(B) Cnidarians	s (C)	Tapeworm	(D)	Planarians		
87.	According to fluid mosaic model, plasma membrane is composed of							
	(A) Phospholipids	and oligosaccharides	5					
	(B) Phospholipids and hemicellulose							
	(C) Phospholipids and integral proteins							
	(D) Phospholipids	, extrinsic proteins a	nd intrinsic	proteins				
88.	If the diploid number of chromosomes in a cell is 8, what shall be the number of chromatids each daughter cell after meiosis I?							
	(A) 2	(B) 4	(C)	8	(D)	16		
89.	An essential amin	o acid is an amino a	cid that					
	(A) Is synthesised	in the body	(B)	Is missing from	n the d	iet		
	(C) Must be provid	led in the diet	(D)	Does not exist	as a zw	vitterion		
90.	Pneumatophores of	occur in plants of						
	(A) Sandy soil		(B)	Saline marshy	v soil			
	(C) Marshy soil		(D)	Water				

 $\times \cdot \times \cdot \times \cdot \times \cdot \times$



THIS PAGE IS LEFT INTERNOVALLY BLANK.

THIS PAGE IS LEFT INTERNOVALLY BLANK.



THIS PAGE IS LEFT INTERNOVALLY BLANK.