



Studymate Foundation Paper

Date : 23/12/2018	Physics, Chemistry & Mathematics/Biology	CLASS
Duration : 90 Min.	(Set-1)	NI NI
Max. Marks : 90		

General Instructions:

- **1.** All questions are compulsory.
- **2.** Each question is allotted ONE mark for each correct response.
- **3.** No deduction from the total score will be made if no response is indicated for the question in the answer sheet.
- **4.** There is only **ONE** correct response for each question. Filling up **MORE THAN ONE** response in each question will be treated as wrong response.
- 5. The paper contains 90 questions (Physics 1-30, Chemistry 31-60, Mathematics 61-90 / Biology 61-90).
- 6. NON-MEDICAL students attempt Physics, Chemistry and Mathematics and MEDICAL Students attempt Physics, Chemistry and Biology.
- 7. Use of calculators is not allowed.

Physics

1. A block is kept on the floor of an elevator at rest. The elevator starts descending with an acceleration of 12 m/s^2 . Taking g = 10 m/s^2 , find out the displacement of the block during the first 0.2 sec after the start.

(a) 0.04 meter

2. A satellite is orbiting around the earth with a period T. If the earth suddenly shrinks to half its radius without change in mass, the period of revolution of the satellite will be

(a)
$$\frac{T}{\sqrt{2}}$$
 (b) $\frac{T}{2}$ (c) $\frac{T}{2\sqrt{2}}$ (d) $\sqrt{2}$ T

3. Figure shows a siphon. The liquid is water. The pressure difference $P_B - P_A$ between the points A and B is



4. A motor drives a body along a straight line with a constant force. The power P developed by the motor must vary with time t. Identify the correct graph.



neips excern						
5.	In which of the follow	ing media will sound tra	vel tl	ne fastest?		
	(a) Solid		(b)	Both solid and liq	uid	
	(c) Liquid		(d)	Gas		
6.	Error in the measure	ment of radius of a sphe	re is	1%. Then error in	the	volume is
	(a) 1%	(b) 5%	(c)	3%	(d)	8%
7.	In the equation S_{max}	$= u + \frac{a}{(2n-1)}$, the letter	s ha	ve their usual mea	aning	s. The dimensional
	formula of S _ is	2				,
	(a) $[M^{1}L^{0}T^{1}]$	(b) $[M^{1}L^{-1}T^{-1}]$	(c)	$[M^0L^1T^{-1}]$	(d)	$[M^{0}L^{1}T^{0}]$
8.	If $ \vec{v_1} + \vec{v_2} = \vec{v_1} - \vec{v_2} $ a	and $ \vec{v}_{\alpha} $ is finite then	. ,		.,	
	$(a) \overrightarrow{a} is \text{ porellol to } \overrightarrow{a}$	→ →		\rightarrow \rightarrow		
	(a) V_1 is parallel to V_1	72	(C)	$v_1 = v_2$		
	(c) $ \mathbf{v}_1 = \mathbf{v}_2 $		(d)	\mathbf{v}_1 and \mathbf{v}_2 is mu	tually	y perpendicular
9.	Two particles of equal	masses are revolving in	circu	llar paths of radii r	1 and	$\mathbf{r}_{_{2}}$ respectively with
	the same time period		ipeta			
	(a) r_1 / r_2	(b) $\sqrt{r_2} / r_1$	(c)	$(r_1/r_2)^2$	(d)	$(r_2 / r_1)^2$
10.	In which of the follow	ing cases, the work done	e by a	a gas is minimum?)	
			(III)		(IV)	
	(a) (I)	(b) (II)	(c)	(III)	(d)	(IV)
11.	A carnot engine has a	an efficiency of 50% whe	en its	s sink temperature	e is 2	7°C. What must be
	the change in its sour	rce temperature for mak	king e	efficiency 60%?		
	(a) 250 K	(b) 200 K	(c)	180 K	(d)	150 K
12.	Find the torque of a borigin	force $\vec{F} = (-3\hat{i} + \hat{j} + 5\hat{k})N$	actin	g at the point \vec{r} =	= (7î +	$(\hat{j} + \hat{k})m$ about the
	(a) $14\hat{i} - 38\hat{j} + 16\hat{k}$	(b) $4\hat{i}+4\hat{j}+6\hat{k}$	(c)	$-14\hat{i}+38\hat{j}-16\hat{k}$	(d)	$-4\hat{i}-4\hat{j}-6\hat{k}$
13.	Three particles each They start moving wit centroid G. If after col	of mass m are located th equal speed v each alo llision, A comes to rest a	at th ong th nd B	he vertices of an e ne medians of the retraces its path a	quila trian§ along	teral triangle ABC. gle and collide at its GB, then C
	(a) also comes to rest	t				A A
	(b) moves with a spee	ed <i>v</i> along CG				/
	(c) moves with a spee	ed <i>v</i> along BG			/	Ğ
	(d) moves with a spee	ed <i>v</i> along AG			В́	C

- **14.** A man can swim in still water with a velocity of 10 km/h, when the water of the river is flowing with some velocity. When the man swims at an angle of 30° with the normal on the bank of the river, he reaches the point just opposite to the starting point. The velocity of the water of the river is
 - (a) 10 km/h (b) 5 km / h (c) $5\sqrt{2}\text{ km / h}$ (d) $10\sqrt{2}\text{ km / h}$

15. The dimensions of two wires A and B are the same But their materials are different. Their load-extension graphs are shown. If Y_A and Y_B are the values of Young's modulus of elasticity of A and B respectively, then



(a)
$$Y_A > Y_B$$
 (b) $Y_A < Y_B$ (c) $Y_A = Y_B$ (d) $Y_B =$

16. In the following given curves the relation between the slopes will be



(a) $\tan \theta_1 > \tan \theta_2$ (b) $\tan \theta_2 > \tan \theta_1$ (c) $\tan \theta_1 = \tan \theta_2$ (d) None of these **17.** What will be the value of acceleration due to gravity at the surface of a planet having radius $\left(\frac{1}{4^{th}}\right)$ to radius of earth and density half of the earth :

- (a) $\frac{g}{2}$ (b) 2g (c) $\frac{g}{8}$ (d) g
- **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. In the relation $\left(P + \frac{a}{V^2}\right)(V - b) = R\theta$. Where p = pressure, V = volume, R = gas const., $\theta = \text{temperature & a and b are some constant.}$ the dimension of b is

(a) $M^{\circ}L^{3}T^{\circ}$ (b) $M^{\circ}L^{-3}T^{\circ}$ (c) $ML^{2}T^{\circ}$ (d) None of these

20. Two force, each numerically equal to 5N, are acting as shown in the figure. Then the resultant is



21. An ideal gas of mass m in a state A goes to another state B via three different process as shown in figure. If Q₁, Q₂ and Q₃ denote the heat absorbed by the gas along the three paths, then





22. A particle moves in a circular path with a uniform speed. Its motion is

- (a) periodic
- (c) simple harmonic

- (b) oscillatory
- (d) angular simple harmonic
- 23. 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



- **24.** Which of the following is correct?
 - (a) A particle moving with constant speed can have variable acceleration
 - (b) A particle moving with constant velocity can have variable acceleration
 - (c) If velocity of the particle is zero, acceleration must be zero
 - (d) If acceleration of the particle is zero, velocity must be zero
- 25. Two blocks A and B of masses 2 kg and 1 kg rest on a friction less surface. A force of 3 N acts on A as shown in figure. The force exerted by A on B is
 - (a) 1 N (b) 3 N
 - (c) 2 N (d) Zero
- **26.** O is the centre of an equilateral triangle ABC. F_1 , F_2 and F_3 are the three forces acting along the sides AB, BC and AC respectively. What should be the value of F_3 so that the total torque about O is zero?

(a)
$$2(F_1 + F_2)$$

(b)
$$\frac{F_1 + F_2}{2}$$

(c)
$$\mathbf{F}_{1} - \mathbf{F}_{2}$$

(d)
$$F_1 + F_2$$

27. V versus T curves at constant pressures P_1 and P_2 for an ideal gas are shown in figure. Here



(d) $P_1 \ge P_2$

 \mathbf{F}_{2}

28. Consider the processes A and B shows in figure. It is possible that



- (a) both the processes are isothermal both the processes are adiabatic (b)
- (c) A is isothermal and B is adiabatic
- A is adiabatic and B is isothermal (d)

29. Figure represents two simple harmonic motions

The parameter which has different values in the two motions is

- (a) amplitude (b) frequency (c) phase (d) maximum velocity
- **30.** An incompressible liquid travels as shown in figure. The speed of the fluid in the lower branch will be



Chemistry

01.	and 8 moles of B is	→ C,		Jinc	u by starting the re	action	Shi with 5 moles of A
	(a) 5 moles	(b)	8 moles	(c)	16 moles	(d)	4 moles
32.	Which has the maxim	um r	umber of molecule	es an	nong the following?)	
	(a) 44 g of CO_2	(b)	$48 \mathrm{g}\mathrm{O}_2$	(c)	$8 \mathrm{g}\mathrm{H_2}$	(d)	$64 \operatorname{g}{\mathrm{SO}_2}$
33.	The wave number of t 9 times the Rydberg's	he sp cons	ectral line in the en tant if the electron	nissio jum	on spectrum of hyd ps from	lroge	n will be equal to 8/
	(a) $n = 3$ to $n = 1$	(b)	n = 10 to $n = 1$	(c)	n = 9 to $n = 1$	(d)	n = 2 to $n = 1$
34.	The following quantum	n nui	nbers are possible	for h	ow may orbitals?		
	n = 3, l = 2, m = +2	2					
	(a) 1	(b)	2	(c)	3	(d)	4
35.	The correct decreasin is	g ord	er first ionization e	entha	alpies of five eleme	nts c	of the second period
	(a) $Be > B > C > N > B$	י (b)	N > F > C > B > B	e (c)	F > N > C > Be > H	3 (d)	F > C > N > B > Be
36.	The increasing order	of the	e ionic radii of the	giveı	n isoelectronic spe	cies	is
		<i>a</i>)	C_{2}^{2+} V ⁺ C ¹⁻ S ²⁻	(c)	K ⁺ , S ²⁻ , Ca ²⁺ , Cl ⁻	(d)	Cl ⁻ , Ca ²⁺ , K ⁺ , S ²⁻
	(a) S^{2-} , Cl^{-} , Ca^{2+} , K^{+}	(b)	Ca^{-}, K, CI, S^{-}	(-)	, - , , -	()	,,-
37.	 (a) S^{2−}, Cl[−], Ca²⁺, K⁺ The species having be 	(b) ond o	rder different from	that	in CO is	()	,,,,
37.	 (a) S^{2−}, Cl[−], Ca²⁺, K⁺ The species having bo (a) NO[−] 	(b) ond o: (b)	rder different from	that (c)	in CO is CN ⁻	(d)	N ₂
37. 38.	 (a) S^{2−}, Cl[−], Ca²⁺, K⁺ The species having be (a) NO[−] Which of the following 	(b) ond o: (b) g is a	rder different from NO ⁺ polar molecule?	that (c)	in CO is CN-	(d)	N ₂
37. 38.	 (a) S^{2−}, Cl[−], Ca²⁺, K⁺ The species having be (a) NO[−] Which of the following (a) BF₃ 	(b) ond o: (b) g is a (b)	rder different from NO ⁺ polar molecule? SF ₄	(c) that (c) (c)	in CO is CN ⁻ SiF ₄	(d) (d)	N ₂ XeF ₄
37. 38. 39.	 (a) S²⁻, Cl⁻, Ca²⁺, K⁺ The species having be (a) NO⁻ Which of the following (a) BF₃ In order to increase the 	(b) ond o: (b) g is a (b) ne vol	rder different from NO ⁺ polar molecule? SF ₄ ume of a gas by 10	(c) that (c) (c) %, th	in CO is CN^{-} SiF_4 he pressure of the g	(d) (d) gas s	N_2 XeF ₄ hould be
37. 38. 39.	 (a) S²⁻, Cl⁻, Ca²⁺, K⁺ The species having be (a) NO⁻ Which of the following (a) BF₃ In order to increase th (a) decreased by 10% 	(b) ond o: (b) g is a (b) ne vol (b)	rder different from NO ⁺ polar molecule? SF_4 ume of a gas by 10 decreased by 1%	(c) (c) (c) %, th (c)	in CO is CN^{-} SiF ₄ ne pressure of the g increased by 10%	(d) (d) gas s	N_2 XeF ₄ hould be increased by 1%
37. 38. 39. 40.	 (a) S²⁻, Cl⁻, Ca²⁺, K⁺ The species having bo (a) NO⁻ Which of the following (a) BF₃ In order to increase th (a) decreased by 10% The density of a gas is 	(b) ond o: (b) g is a (b) ne vol (b) s 1.96	rder different from NO ⁺ polar molecule? SF_4 ume of a gas by 10 decreased by 1% 4 g dm ⁻³ at 273 K a	(c) (c) (c) %, th (c) and 7	in CO is CN ⁻ SiF₄ he pressure of the g increased by 10% '6 cm Hg. The gas i	(d) (d) gas s (d) (s	N_2 XeF ₄ hould be increased by 1%
37. 38. 39. 40.	 (a) S²⁻, Cl⁻, Ca²⁺, K⁺ The species having be (a) NO⁻ Which of the following (a) BF₃ In order to increase th (a) decreased by 10% The density of a gas is (a) CH₄ 	(b) ond o: (b) g is a (b) ne vol (b) s 1.96 (b)	rder different from NO ⁺ polar molecule? SF_4 ume of a gas by 10 decreased by 1% 4 g dm ⁻³ at 273 K a C_2H_6	(c) (c) (c) %, th (c) and 7 (c)	in CO is CN^{-} SiF ₄ ne pressure of the g increased by 10% '6 cm Hg. The gas i CO_2	(d) (d) gas s (d) is (d)	N_2 XeF ₄ hould be increased by 1% Xe

41.	The value of enthalpy change (Δ H) for the reaction						
	$C_2H_5OH(l)$ + $3O_2(g)$ → $2CO_2(g)$ + $3H_2O(l)$						
	at 27°C is –136 temperature w	ó6∙5 kJ mol⁻¹ rill be	. The value of inter	mal e	energy change for t	he al	pove reaction at this
	(a) −1371·5 k.	J (b)	–1369·0 kJ	(c)	–1364·0 kJ	(d)	–1361·5 kJ
42.	For reaction 2	$Cl(g) \rightarrow Cl_2(g)$, the signs of ΔH as	nd AS	S respectively are		
	(a) +,-	(b)	+,+	(c)	-,-	(d)	-,+
43.	Which one of t	he following	molecular hydride	s act	s as a Lewis acid?		
	(a) CH ₄	(b)	NH ₃	(c)	H ₂ O	(d)	B_2H_6
44.	The hydrogen	ion concentr	ation of a 10 ^{–8} M H	Cl aq	ueous solution at	298 1	K (K _w = 10^{-13}) is
	(a) 9·525 × 10	⁻⁸ M (b)	$1.0 \times 10^{-8} \text{ M}$	(c)	$1.0 \times 10^{-6} \text{ M}$	(d)	$1.0525 \times 10^{-7} \mathrm{M}$
45.	Which of the fo	ollowing spec	eies can function b	oth a	s oxidising as well	as re	educing agent?
	(a) Cl⁻	(b)	C10-4	(c)	C10-	(d)	MnO_{4}^{-}
46.	$Zn^{2+} \rightarrow Zn(s)$;	E° = −0.76 V	$Cu^{2+} \rightarrow Cu(s)$; E°	= -0.	34 V		
	Which of the fo	ollowing is sp	ontaneous?				
	(a) $Zn^{2+} + Cu$	\rightarrow Zn + Cu ²⁺		(b)	$Cu^{2+} + Zn \rightarrow Cu +$	Zn ²⁺	•
	(c) $Zn^{2+} + Cu^2$	$^{+} \rightarrow Zn + Cu$		(d)	none of these		
47.	The salt respo	nsible for per	rmanent hardness	of H ₂	O is		
	(a) Na ₂ SO ₄	(b)	Mg(HCO ₃) ₂	(c)	NaCl	(d)	$MgCl_2$
48.	The least stabl	e hydride of	15th group is				
	(a) NH ₃	(b)	PH ₃	(c)	AsH ₃	(d)	BiH ₃
49.	The sequence	of ionic mob	ility in aqueous so	lutio	n is		
	(a) $Rb^+ > K^+ >$	$Cs^+ > Na^+$		(b)	$Na^+ > K^+ > Rb^+ > C$	s^+	
	(c) $K^+ > Na^+ >$	$Rb^+ > Cs^+$		(d)	$Cs^+ > Rb^+ > K^+ > N$	a⁺	
50.	Which pair of t	the following	chlorides do not in	npart	colour to the flam	e?	
	(a) $BeCl_2$ and	$SrCl_2$ (b)	BeCl_2 and MgCl_2	(c)	$\mathrm{MgCl}_{\scriptscriptstyle 2}\mathrm{and}\mathrm{CaCl}_{\scriptscriptstyle 2}$	(d)	BaCl_2 and SrCl_2
51.	The stability o	f +1 oxidatio	n state increases i	n the	e sequence		
	(a) Ga < In < <i>I</i>	Al < T1 (b)	Al < Ga < In < Tl	(c)	Tl < In < Ga < Al	(d)	In < Tl < Ga < Al
52.	The structure	of diborane (I	$B_{2}H_{6}$) contains				
	(a) four 2c-2e	bonds and tw	vo 3c-2e bonds	(b)	two 2c-2e bonds a	ind fo	our 3c-2e bonds
	(c) two 2c-2e1	oonds and tw	o 3c-2e bonds	(d)	four 2c-2e bonds	and f	our 3c-2e bonds
53.	In hexa-1, 3-d	ien-5-yne, th	e number of C–C, o	5 , С–	C π and C–H σ bone	ds re	spectively are
	(a) 5, 4 and 6	(b)	6, 3 and 5	(c)	5, 3 and 6	(d)	6, 4 and 5
54.	The IUPAC nat	me of the con	npound CH ₃ CH = C	CHC =	≡ CH is		
	(a) Pent-4-yn-	-2-ene (b)	Pent-3-en-1-yne	(c)	Pent-4-en-4-yne	(d)	Pent-1-yn-3-ene
55.	Which of the fe	ollowing spec	cies is not electrop	hilic	in nature?		
	(a) Cl⁺	(b)	BH_3	(c)	$H_{3}O^{+}$	(d)	$^{+}NO_{2}$
56.	Among the foll	owing, the al	kene on ozonolysis	s givi	ng rise to only one	alde	hyde as the product
	18				_		
	(a) But-1-ene			(b)	Propane		
	(c) But-2-ene			(d)	2-Methylprop-1-e	ne	

57.	Wh	ich of the follow	wing com	pounds will	show geom	etrical isome	erism?		
	(a)	cyclohexene			(b)	hex-2-ene			
	(c)	hex-3-yne			(d)	1,1-diphen	ylethylene		
58.	The of p	e alkene that w	ill give the	e same prod	uct with HI	Br in the abs	ence as wel	l as in the p	presence
	(a)	But-2-ene	(b)	But-1-ene	(C)	propane	(d)	hex-1-ene	;
59 .	ʻWh	ite lung cance	r' is cause	ed by					
	(a)	asbestos	(b)	silica	(c)	textiles	(d)	paper	
60.	Lon	idon smog is fo	und in						
	(a)	Summer duri	ng day tin	ne	(b)	Summer d	uring morn	ing time	
	(c)	Winter during	g morning	time	(d)	Summer di	uring day ti	ime	
			F	OR NON-ME	DICAL STUE	ENTS ONLY			
				Ma	thematio	28			
61.	In a the	a town of 840 p number of per	ersons, 4 rson who	50 persons : read neithe	read Hindi, r is	300 read Er	nglish and 2	200 read bo	th. Then
	(a)	240	(b)	290	(c)	180	(d)	160	
62.	Let from	m(A) = m and m m A to B is	n(B) = n. T	hen the tota	al number (of non-empt	y relations	that can be	e defined
	(a)	m^n	(b)	$n^m - 1$	(c)	mn-1	(d)	$2^{mn} - 1$	
63.	The	e domain and 1	cange of tl	ne real func	tion <i>f</i> defin	ed by $f(x)$ =	$=\frac{4-x}{x-4}$ is g	iven by	
	(a)	Domain = R	, Range =	{-1, 1}	(b)	Domain =	R – {–1}, Ra	nge = R	
	(c)	Domain = R	- {4}, Ran	ıge = {−1}	(d)	Domain =	R – {–4}, Ra	nge = {-1, 1	1}
64.	The	e value of $\frac{1-t}{1+t}$	$rac{\mathrm{an}^2 15^\circ}{\mathrm{an}^2 15^\circ}$ i	S					
	(a)	1	(b)	$\sqrt{3}$	(c)	$\frac{\sqrt{3}}{2}$	(d)	2	
65 .	The	e value of tan 3	3A – tan 2	A – tan A is	equal to				
	(a)	tan 3A tan 2	A tan A						
	(b)	–tan 3A tan	2A tan A						
	(c)	tan A tan 2A	A – tan 2A	tan 3A – ta	n 3A tan A				
	(d)	None of the	se						
66.	The	e value of sin(4	5° + θ) – α	cos(45° – θ) i	is				
	(a)	$2\cos\theta$	(b)	$2\sin\theta$	(c)	1	(d)	0	
67.	If s	$\sin \theta + \cos \theta = 1$, then th	e value of si	n 20 is equ	al to			
	(a)	1	(b)	1/2	(c)	0	(d)	-1	
68.	If x	ⁿ – 1 is divisibl	e by $x - k$, then the le	east positiv	e value of k	is		
	(a)	1	(b)	2	(c)	3	(d)	4	

69.	The value o	of $1 + t^2 + t^4 + t^6$	+ + t^{20} is				
	(a) 1	(b)	-1	(c)	0	(d)	2
70.	What is the	value of $\frac{i^{4n+1}}{2}$	$\frac{i^{4n-1}}{2}$?				
	(a) 1	(b)	i	(c)	-1	(d)	-i
71.	Given that .	x, y and b are re	eal numbers x < y	y, b < 0	, then		
	(a) $\frac{x}{b} < \frac{y}{b}$	(b)	$\frac{x}{b} \le \frac{y}{b}$	(c)	$\frac{x}{b} > \frac{y}{b}$	(b)	$\frac{x}{b} \ge \frac{y}{b}$
72.	There are 1 number of v	0 lamps in a ha ways in which t	ll. Each one of th he hall can be ill	nem car uminat	n be switched on ed.	indep	pendently. Find the
	(a) $2^{10} - 1$	(b)	2^{10}	(c)	10!	(d)	10 ²
73.	Every body The total nu	in a room shak umber of person	tes hands with ev ns in the room is	veryboo	ly else. The total	numl	per of shakes is 66.
	(a) 11	(b)	12	(c)	13	(d)	14
74.	The total nu	umber of terms	in the expansion	n of (<i>x</i> +	$(x-a)^{51} - (x-a)^{51}$ aft	er sir	nplification is
	(a) 102	(b)	25	(c)	26	(d)	None of these
75.	If the coeffi	cient of x^7 and .	$x^8 \ln \left(2 + \frac{x}{3}\right)^n$ are	e equal	, then <i>n</i> is		
	(a) 56	(b)	55	(c)	45	(d)	15
76.	In an A.P. t	he $p^{ ext{th}}$ term is q	and the $(p + q)$ th	term i	is 0. Then the $q^{ m th}$	term	is
	(a) – <i>p</i>	(b)	p	(c)	p + q	(d)	p-q
77.	Sum of 1^2 +	$2^2 + 3^2 + \dots +$	n^2 is				
	(a) <u>n(n +</u>	$\frac{1)(n+2)}{6}$ (b)	$\frac{n(n+1)(2n+1)}{6}$	(c)	$\frac{n(n+1)(n-1)}{3}$	(d)	$\frac{n(n-1)(n-2)}{3}$
78.	Equation of	line passing th	rough (1, 2) and	paralle	1 to the line $y = 3$	x−1 i	S
	(a) y+2 =	= x + 1 (b)	y + 2 = 3(x + 1)	(c)	y - 2 = 3(x - 1)	(d)	y - 2 = x - 1
79.	If <i>a</i> , <i>b</i> , <i>c</i> are	in A.P., then the	ne straight line <i>a</i> .	x + by	+ $c = 0$ will always	s pass	s through
	(a) (1,2)	(b)	(1, -2)	(c)	(2, 1)	(d)	(-2, 1)
80.	The equation	on of the circle v	which passes thro	ough th	e point (4, 5) and	has i	ts centre at (2, 2) is
	(a) $(x-2)^2$	$(y-2)^2 = 13$		(b)	$(x-2)^2 + (y-2)^2 =$	= 26	
	(c) $(x-2)^2$	$(y+2)^2 = 13$		(d)	$(x+2)^2 + (y+2)^2 =$	= 13	
81.	The length	of the foot of pe	rpendicular draw	n from	the point <i>P</i> (3, 4,	5) on	<i>y</i> -axis is
	(a) 10	(b)	$\sqrt{34}$	(c)	$\sqrt{113}$	(d)	$5\sqrt{2}$
82.	$\lim_{x\to 0}\frac{\sin x}{x(1+\cos x)}$	$\frac{x}{(x,x)}$ is equal to					
	(a) 0	(b)	$\frac{1}{2}$	(c)	1	(d)	-1

83.	$\lim_{x\to 0}$	$\frac{ x }{x}$ is equal to						
	(a)	x 1	(b)	-1	(c)	0	(d)	Does not exist
84.	If <i>f</i> (x	x) = $x \sin x$, then	$f'\left(\frac{\pi}{2}\right)$	is equal to				
	(a)	0	(b)	1	(c)	-1	(d)	$\frac{1}{2}$
85.	$\lim_{x\to\pi}\frac{s}{s}$	$\frac{\sin x}{x-\pi}$ is						
	(a)	1	(b)	2	(c)	-1	(d)	-2
86.	If ⁿ C	$C_{12} = {}^{n}C_{8}$, then <i>n</i> is	equa	ıl to				
	(a)	20	(b)	12	(c)	6	(d)	30
87.	The	mean deviation o	of the	data 2, 9, 9, 3, 6, 9	9,4 fi	rom the mean is		
	(a)	2.23	(b)	2.57	(c)	3.23	(d)	3.57
88.	If th	e focus of a parat	oola is	s (0, –3) and its dire	ectriz	x is $y = 3$, then its e	equa	tion is
	(a)	$x^2 = -12y$	(b)	$x^2 = 12y$	(c)	$y^2 = -12x$	(d)	$y^2 = 12x$
89.	In a	non-leap year, th	le pro	bability of having 5	3 tue	esdays or 53 wedne	esdag	ys is
	(a)	$\frac{1}{7}$	(b)	$\frac{2}{7}$	(c)	$\frac{3}{7}$	(d)	None of these
90.	A sin vow	ngle letter is selec el is	cted a	t random from the v	word	'PROBABILITY'. Th	ie pr	obability that it is a
	(a)	$\frac{1}{3}$	(b)	$\frac{4}{11}$	(c)	$\frac{2}{11}$	(d)	$\frac{3}{11}$
				FOR MEDICAL STU	JDEN	ITS ONLY		
				Biolog	gу			
61.	As v char	ve go from speci racteristics	ies to	kingdom in a ta	xono	omic hierarchy, th	le ni	umber of common
	(a) v	will decrease			(b)	will increase		
	(c) 1	remain same			(d)	may increase or d	lecre	ease
62.	Mate	ch the following a	nd ch	oose the correct op	tion:			
	• •	D. 11				· 1		

A. Family i. tuberosum B. Kingdom ii. Polymoniales C. Order iii. Solanum D. Species iv. Plantae E. Genus Solanacea v. Options (a) i-D, ii-C, iii-E, iv-B, v-A (b) i-E, ii-D, iii-B, iv-A, v-C (c) i-D, ii-E, iii-B, iv-A, v-C (d) i-E, ii-C, iii-B, iv-A, v-D



neipo exeer i	i bourdo								
63.	Dif	ference between Vi	rus a	and Viroid is					
	(a)	(a) absence of protein coat in viroid but present in virus							
	(b) presence of low molecular weight RNA in virus but absent in viroid								
	(c)	both (A) and (B)							
	(d)	(d) none of the above							
64.	ΑP	Prothallus is							
	(a) a structure in pteridophytes formed before the thallus develops.								
	(b)	a sporophytic free	livin	g structure formed	l in p	teridophytes.			
	(c)	a gametophyte fre	e livi	ng structure forme	ed in	pteridophytes.			
	(d)	a primitive struct	are f	ormed after fertiliz	ation	in pteridophytes	•		
65.	If then the second seco	he diploid number o losperm ?	of a fl	owering plant is 36	5. Wh	at would be the cl	nromo	osome number in its	
	(a)	36	(b)	18	(c)	54	(d)	72	
66.	Wh	ich of the following	g pair	s of animals has n	on gl	andular skin?			
	(a)	Snake and Frog			(b)	Chameleon and	Turtl	le	
	(c)	Frog and Pigeon			(d)	Crocodile and Ti	ger		
67.	Wh	ich one of the follo	wing	statements is inc	orrec	t?			
	(a)	Mesoglea is prese	nt in	between ectoderm	n and	endoderm in Obe	elia.		
	(b)	(b) Radial symmetry is found in Asterias							
	(c)	Fasciola is a pseudocoelomate animal							
	(d)	Taenia is a triplot	olasti	c animal					
68.	Phy	ylum	_ ha	ve two different ty	pes o	of symmetry "Radi	al &	bilateral".	
	(a)	Coelenterata	(b)	Platyhelminthes	(c)	Nematoda	(d)	Echinodermata	
69.	Bo cav	ody cavity is the cav vity is not lined by a	rity p mesc	resent between bo derm. Such anima	dy w als ar	all and gut wall. I e called	n son	ne animals the body	
	(a)	Acoelomate	(b)	Pseudocoelomate	e (c)	Coelomate	(d)	Haemocoelomate	
70.	Rea opt	arrange the followin ion.	ng zo	nes as seen in the	root	in vertical section	n and	l choose the correct	
	A.	Root hair zone			В.	Zone of merister	ms		
	C.	Rootcap zone			D.	Zone of maturat	ion		
	Е.	Zone of elongation	L						
	Op	tions:							
	(a)	C, B, E, A, D	(b)	A, B, C, D, E	(c)	D, E, A, C, B	(d)	E, D, C, B, A	
71.	The ma	e protoplasmic stra: terial occur are cal	nds o led	connecting the two	adja	cent plant cells th	rougl	h which exchange of	
	(a)	Plasmalemma	(b)	Plasmodesmata	(c)	Tonofibrils	(d)	Spindle fibers	
72.	In o	cockroach, the excr	retory	v organs are Malpi	ghiar	tubules. They are	e foui	nd on the	
	(a)	Distal region of mi	d gu	t	(b)	Proximal region	of mi	id gut	
	(c)	Proximal region of	hind	l gut	(d)	Junction of mid	gut a	nd hind gut	
73.	Wh	ich of the following	is ar	anticoagulant and	l che	cks blood coagula	tion i	n blood vessels?	
	(a)	Prothrombin	(b)	Globulin	(c)	Thromboplastin	(d)	Heparin	

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74.	The oblique cross connections to form a contractile network of fibers and the intercalated discs are characteristically found in						
	(a) Striated muscle (b) Unstriated mu	uscle(C) Cardiac muscle (d) Radial muscle					
75.	Go through the following statement.						
	(i) The cambium is generally more active	on the inner side than on the outer.					
	(ii) The autumn wood is darker and has a	higher density than spring wood.					
	(iii) In stem, the secondary xylem shows distinction into protoxylem and metaxylem and occurs in the form of patches.						
	(iv) The tracheids and vessels of the sapv parenchyma cells into their cavities, c	wood get plugged by the ingrowth of the adjacent called tyloses.					
	Which of these are correct?						
	(a) (i), (ii) & (iii) (b) (i), (ii) & (iv)	(c) (i) & (ii) (d) (i), (iii) & (iv)					
76.	Pericycle in roots is never thick and sclere	enchymatous because					
	(a) It does not act as mechanical tissue in	1 roots.					
	(b) It gives rise to root hair						
	(c) It is place of origin of lateral roots						
	(d) It gives rise both to root hairs and root	branches					
77.	Coleoptile and coleorhiza are protective co	overings in maize grain. Which is true?					
	(a) Coleorhiza is a covering of plumule	(b) Coleoptile is covering of radicle					
	(c) Coleoptile is covering of plumule	(d) Coleorhiza is covering of endosperm					
78.	If a plant bears unisexual, bisexual and ev	ven neutral flowers, it is called					
	(a) Bisexual (b) Polygamous	(c) Bigamous (d) Monoecious					
79.	Lateral line system found in fishes has been	en lost in Amphibia because of					
	(a) Development of sturdy legs						
	(b) Change over to herbivorous feeding						
	(c) Occurrence of metamorphosis in Ampl	hibia					
	(d) Evolution to terrestrial habitat						
80.	Body having meshwork of cells, internal ca	avities lined with food filtering flagellated cells and					
	indirect development are the characteristi	c features of phylum					
	(a) Coelenterata (b) Porifera	(c) Mollusca (d) protozoa					
81.	Thorns of Bougainvillea and tendrils of Cue	curbita shows					
~~	(a) Homology (b) Analogy	(c) Adaptive radiation(d) Atavism					
82.	Viruses have						
	(a) DNA core, Lipid coat	(b) DNA or RNA core, Protein coat					
~~	(c) DNA or RNA core, Plasma membrane	(d) DNA containing nucleus, lipid envelope					
83.	In Lichens, algal component is known as						
~ ~	(a) Mycobiont (b) Phycobiont	(c) Schizont (d) Heterocyst					
84.	The outer covering of cartilage is called as						
07	(a) Peritoneum (b) Periosteum	(c) Endosteum (d) Perichondrium					
85.	Arteries nave						
	(a) thick wall, narrow lumen	(b) thick wall, broad lumen					
	(c) thin wall, broad lumen	(a) thin wall, narrow lumen					

86. Enzymes are biocatalysts. They (a) increase the rate of biochemical reaction, decrease the activation energy (b) increase the rate of biochemical reaction, increase the activation energy (c) decrease the rate of biochemical reaction, increase the activation energy (d) decrease the rate of biochemical reaction, decrease the activation energy 87. When the margins of sepals or petals overlap one another without any particular direction, the condition is termed as (a) imbricate (b) twisted (d) vexillary (c) valvate 88. When a fresh water protozoan is placed in marine water (a) contractile vacuole disappears (b) contractile vacuole increases in size (c) a number of contractile vacuoles appear (d) the contractile vacuole remains unchanged 89. DNA replication in bacteria occurs (a) within nuclelous prior to fission (b) (c) just before transcription during S phase (d) 90. On hydrolysis, Nucleoside does not yield (a) Phosphoric acid (b) Pentose sugar (c) Purine (d) Pyrimidine

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