NOT TO BE OPENED BEFORE TIME OR TILL ASKED TO DO SO)

(BPH-EE-2019)

	FII-LL-2019)	
Code		
Time: 1¼ Hours (75 minutes)	Total Questions: 130	M
Candidata'a Nama	D-4 CD:-41-	

Time: $1\frac{1}{4}$ Hours (75 n	ninutes) Total Q	uestions: 130	Max. Marks: 100
Candidate's Name :		Date of Birth:	
Father's Name:		Mother's Name):
Roll No	(in figure)	···	(in words)
Date of Examination:			
(Signature of the Invigila	ator)	(Signat	ture of the candidate)

CANDIDATES MUST READ THE FOLLOWING INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER & FOLLOW THEM.

- 1. All questions under Part-A and Part-B are compulsory. Part-C is optional. The candidates may attempt either Optional Part-C (i) OR Optional Part-C(ii). All questions carry equal marks i.e. one mark each.
- 2. The candidate MUST return this question book-let and the OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- 3. The candidate MUST NOT do any rough work OR writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself.
- 4. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 5. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
- 6. Use only Blue or Black <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 7. There will be no negative marking. Each correct answer will be awarded one full mark Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 8. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE QUESTION BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER THE START OF EXAMINATION.



10157

Sr. No.

Question No.	Questions		
	Part-A (Physics)		
1.	The strength of Weak nuclear force relative to Electromagnetic force is of the order of		
	$(1) 10^{-13} \qquad (2) 10^{-11}$		
	$(3) 10^{13} (4) 10^{11}$		
2.	Parsec is unit of		
	(1) Mass (2) Length		
	(3) Time (4) Frequency		
3.	If radius of earth contracts by 2% of its actual value and mass of earth remains same then the acceleration due to gravity will		
	(1) Decrease by 2% (2) Decrease by 4%		
	(3) Increase by 2% (4) Increase by 4%		
4.	The position of an object moving along X-axis is given by $x = A + Bt^2$, where $A = 10$ m, $B = 2.5$ ms ⁻² , and t is measured in seconds. The average velocity of this object between $t = 1$ s and $t = 3$ s is		
	(1) 10 ms^{-1} (2) 15 ms^{-1}		
	(3) 20 ms^{-1} (4) 25 ms^{-1}		
5.	A ball is thrown at a speed 28 ms ⁻¹ in a direction 30° above the horizontal. The maximum height attained by the ball will be		
	(1) 25 m (2) 20 m		
	(3) 10 m (4) 5 m		

Question No.	Questions
6.	A small insect enters the eye of person riding a bike, the person then applies sudden brakes to his bike without rubbing his eye and he found that the small insect got out of his eye. By which law of physics the small insect got out of eye
	(1) Newton's third law of motion (2) Newton's second law of motion
	(3) Newton's first law of motion (4) Newton's law of Gravitation
7.	Two bodies with masses m_1 and m_2 ($m_1 > m_2$) are joined by a massless string passing over fixed pulley. The centres of gravity of the two masses are initially at same height. Assume the pulley to be weightless. Then the downward acceleration of mass m_1 is
	(1) $\frac{m_1}{m_1 + m_2} g$ (2) $\frac{m_2}{m_1 + m_2} g$
	(3) $\frac{m_1 - m_2}{m_1 + m_2} g$ (4) $\left[\frac{m_1 - m_2}{m_1 + m_2} \right]^2 g$
8.	A block of mass 1 kg lies on a horizontal surface in a truck. The coefficient of static friction between the block and the surface is 0.6. If the acceleration of truck is $5~\rm ms^{-2}$, the frictional force acting on the block is
	(1) 4 N (2) 5 N
	(3) 6 N (4) 10 N
9.	Two balls of different mass have same kinetic energy. The ball having greater momentum will be
	(1) Heavier one (2) Lighter one
	(3) Both have same (4) Can't say
10.	The moment of inertia of a ring of mass M and radius R about an axis through the diameter in its plane will be
	(1) $0.5 \mathrm{MR^2}$ (2) $\mathrm{MR^2}$
	(3) $1.5 \mathrm{MR^2}$ (4) $2 \mathrm{MR^2}$

Question No.	Questions			
11.	A thin uniform circular discuss rolling down an inclined plane of inclinat 30° without slipping. Its linear acceleration along the plane is	A thin uniform circular discuss rolling down an inclined plane of inclination 30° without slipping. Its linear acceleration along the plane is		
	(1) g/4 (2) g/3			
	(3) g/2 (4) 2g/3			
12.	A projectile, fired vertically upwards with a speed v escapes from earth. If it is to be fired at 45° to the horizontal, what should be its specific to that it escapes from the earth?	the eed		
	(1) v (2) $v/\sqrt{2}$			
,	(3) $\sqrt{2} \text{ v}$ (4) 2v			
13.	Which of the following substances has negligible elastic fatigue?			
	(1) glass (2) copper			
	(3) quartz (4) silver			
14.	The modulus of rigidity of water is			
	(1) zero (2) 1			
	(3) 81 (4) infinite			
15.	The surface tension does not depend upon			
	(1) Nature of liquid (2) Temperature			
	(3) Presence of impurity (4) Atmospheric Pressure			

Question No.			Que	stions
16.	A sample of oxygen and a sample of hydrogen have same mass, volume and pressure. The ratio of their absolute temperature is			
	(1)	1/16	(2)	1/4
	(3)	4	(4)	16
17.	The	e internal energy of a gas w	ill inc	crease when it
	(1)	Expands adiabatically	(2)	Is compressed adiabatically
	(3)	Expands isothermally	(4)	Is compressed isothermally
18.	If the	ne absolute temperature of ntity of heat radiated per	f a per	rfect black body be doubled, then the d increases by
	(1)	Two times	(2)	Four times
	(3)	Eight times	(4)	Sixteen times
19.	The moti	time period of a particle ion from mean position. Aft	unde er 2 s	ergoing S.H.M. is 16 s. It starts its its velocity is 0.4 ms ⁻¹ , the amplitude
	(1)	2.88 m	(2)	1.44 m
	(3)	0.72 m	(4)	0.36 m
20.	The speed of wave represented by $y = A \sin(\omega - kx)$ is			
	(1)	k/ω	(2)	ω/k
	(3)	ωk	(4)	1/ωk

Question No.			Quest	ions
21.		iron spheres, A (a solid spame potential. Which of th		and B (a hollow sphere), are charged hold more energy ?
	(1)	A	(2)	В
	(3)	Both have same	(4)	Can't be predicted
22.				00 watt, respectively, rated at 220 V, of 440 V. Which bulb will fuse?
77	(1)	A	(2)	В
	(3)	Both will fuse	(4)	None will fuse
23.	1000	en a charge particle moves nge in	throu	igh a magnetic field, it may suffer a
	(1)	Energy	(2)	Mass
	(3)	Speed	(4)	Velocity
24.		e electrons are moving par e between them will be	rallel 1	to each other in free space, then the
	(1)	Attractive	(2)	Repulsive
2	(3)	No force	(4)	Can't say anything
25.	Cui	rrent used for electrolysis	is	
	(1)	D.C.	(2)	A.C.
	(3)	Both of these	(4)	None of these

Question No.	Questions			
26.	Lenz's law in electromagnetic induction follows law of conservation of			
	(1) Charge (2) Energy			
*	(3) Linear momentum (4) Angular momentum			
27.	Resistance offered by a Capacitor to D.C. is			
	(1) zero (2) negative			
72 96	(3) positive (4) infinite			
28.	Mechanical analogue of inductance is			
	(1) Displacement (2) Velocity			
	(3) Energy (4) Mass			
29.	The classification of Electromagnetic spectrum is roughly based upon			
	(1) How the waves are produced			
	(2) How the waves are detected			
	(3) Both (1) and (2)			
	(4) Wavelength of waves			
30.	If the atmosphere of earth suddenly disappears then duration of day will			
	(1) Increase by 4 minutes (2) Decrease by 4 minutes			
	(3) No change (4) Can't be predicted			

Question No.		Questi	ons
31.	The blue colour of sky is due	to	
	(1) Reflection of light	(2)	Refraction of light
	(3) Scattering of light		Diffraction of light
32.	If two coherent sources of ratio of intensity of maxim will be	intensi a and m	ty ratio 25:1 interfere, then the ninima in the interference pattern
	(1) 3:2	(2)	9:4
	(3) 5:1	(4)	25:1
33.	Nuclear force between two r	nucleons	depends on their
	(1) Mass	(2)	Charge
-	(3) Spin	(4)	Both (2) and (3)
34.	Charge on a n-type semicon	ductor i	S
	(1) Zero	(2)	Negative
	(3) Positive	(4)	10 ⁻⁶ coulomb
35.	If a zener diode has 9.1 V dissipation of 273 mW, the zener diode is	break de en maxi	own voltage with a maximum power mum current that can pass through
	(1) 40 mA	(2)	30 mA
	(3) 20 mA	(4)	10 mA

Question No.	Questions
	Part-B (Chemistry)
36.	25 mL of a solution of $Ba(OH)_2$ on titration with 0.1 M solution of $HC\ell$ gave a titre value of 35 mL. The molarity of barium hydroxide solution was
43 43	(1) 0.07 (2) 0.14
	(3) 0.28 (4) 0.35
37.	Identify the least stable among the following:
9	(1) Li ⁻ (2) Be ⁻
	(3) B ⁻ (4) C ⁻
38.	The correct order of size among $C\ell$, $C\ell^+$ and $C\ell^-$ is
	(1) $C\ell^{+} < C\ell^{-} < C\ell$ (2) $C\ell^{+} > C\ell^{-} > C\ell$ (3) $C\ell^{+} < C\ell < C\ell^{-}$ (4) $C\ell^{-} < C\ell < C\ell^{+}$
,	(3) $C\ell^+ < C\ell < C\ell^-$ (4) $C\ell^- < C\ell < C\ell^+$
39.	The geometry of $C\ell O_4^-$ ion is :
	(1) Pyramidal (2) Tetrahedral
	(3) Trigonal Planar (4) Trigonal bipyramidal
40.	The number of orbitals in a subshell is equal to
	(1) $2\ell - 1$ (2) 2ℓ
4.	(3) ℓ^2 (4) $2\ell + 1$

		Ques	stions
The for	e term that accounts for intra non-ideal gas is	amole	ecular force in van der Waal's equation
(1)	RT	(2)	V-b
(3)	$P + \frac{a}{V^2}$	(4)	(RT) ⁻¹
Wh abs	ich one of the following orption	is no	ot applicable to the phenomena of
(1)	$\Delta H > 0$	(2)	$\Delta G < 0$
(3)	ΔS < 0	(4)	$\Delta H < 0$
Wh	ich one of the following is a	posit	ively charged sol
(1)	Gold sol	(2)	$\mathrm{As_2S_3}$ sol
(3)	Methylene blue sol	(4)	Gelatin
Wh	at is the normality of 1 M I	I ₃ PO	solution ?
(1)	0.5 N	(2)	1.0 N
(3)	2.0 N	(4)	3.0 N
A cr	ricket ball 0.5 Kg is moving wociated with its motion is:	vith a	velocity of 100 ms ⁻¹ . The wavelength
(1)	1/100 cm	(2)	$6.6 \times 10^{-34} \text{ m}$
(3)	$1.32 \times 10^{-35} \text{ m}$	(4)	$6.6 \times 10^{-28} \text{ m}$
	(1) (3) Wh (1) (3) Wh (1) (3) A cr asso (1)	 (1) RT (3) P + a/V² Which one of the following absorption (1) ΔH > 0 (3) ΔS < 0 Which one of the following is a (1) Gold sol (3) Methylene blue sol What is the normality of 1 M I (1) 0.5 N (3) 2.0 N A cricket ball 0.5 Kg is moving wassociated with its motion is: (1) 1/100 cm 	The term that accounts for intramole for non-ideal gas is (1) RT (2) (3) $P + \frac{a}{V^2}$ (4) Which one of the following is not absorption (1) $\Delta H > 0$ (2) (3) $\Delta S < 0$ (4) Which one of the following is a position (1) Gold sol (2) (3) Methylene blue sol (4) What is the normality of 1 M H ₃ PO (1) 0.5 N (2) (3) 2.0 N (4) A cricket ball 0.5 Kg is moving with a associated with its motion is: (1) 1/100 cm (2)

Question No.	Questions
46.	Ortho and para hydrogen differ in
	(1) atomic number (2) mass number
	(3) electron spin in two atoms (4) nuclear spin in two atoms
47.	Which of the following carbonates is least stable
	(1) $MgCO_3$ (2) Na_2CO_3
	(3) K_2CO_3 (4) Rb_2CO_3
48.	The IUPAC name of the
	Me Me Me Me
	Structure is:
	(1) 2,4,5-triethyl-3-nonene (2) 5,6-diethyl-3-methyl-4-decene
	(3) 2,4,6-triethyl-3-octene (4) 3-ethyl-5-methyl-3-heptene
49.	The strongest base among the following is:
	$(1) \qquad (2) \qquad \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \end{array}$
	$(3) \qquad \qquad (4) \qquad \bigvee_{H}^{NH_2}$
50.	The number of σ -and Π -bonds present in pent-4-ene-1-yne is :
	(1) 10, 3 (2) 4, 9
	(3) 3, 10 (4) 9, 4

Question No.	Questions			
51.	Which alkene on ozonolysis gives $\mathrm{CH_3CH_2CHO}$ and $\mathrm{CH_3COCH_3}$?			
/	(1) $CH_3CH_2CH=C(CH_3)_2$ (2) $CH_3CH_2CH=CHCH_2CH_3$			
	(3) $CH_3CH_2CH=CHCH_3$ (4) $CH_3C(CH_3)=CHCH_3$			
52.	$ \underbrace{NBS}_{A} \xrightarrow{NaC \equiv CH}_{B}, \text{ what are A and B}: $			
	(1) H $C \equiv CH$ $C \equiv C-Na$			
	(3) $C \equiv CH$ (4) None of them			
53.	Identify the compound Y in the following reaction:			
	$ \begin{array}{c c} & NH_2 \\ \hline & NaNO_2 + HC\ell \\ \hline & 273-278 \text{ K} \end{array} $ $ \begin{array}{c c} & Cu_2C\ell_2 \\ \hline & Y + N_2 \end{array} $			
	$(1) \bigcirc^{\mathbb{C}\ell} $ (2) \bigcirc			
	$(3) \qquad \begin{array}{c} C\ell \\ \\ C\ell \end{array} \qquad \qquad (4) \qquad \begin{array}{c} C\ell \\ \\ C\ell \end{array}$			
54.	Which reagent will you use for the following reaction?			
	$\mathrm{CH_{3}CH_{2}CH_{2}CH_{3}} \rightarrow \mathrm{CH_{3}CH_{2}CH_{2}CH_{2}C\ell} + \mathrm{CH_{3}CH_{2}CHC\ell CH_{3}}$			
	(1) $C\ell_2/UV \text{ light}$ (2) $NaC\ell + H_2SO_4$			
	(3) $C\ell_2$ gas in dark (4) $C\ell_2$ gas in the presence of iron in dark			

Question No.	Questions			
55.	In the following sequence of reaction:			
, **	$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$			
	The compound D is:			
	(1) Butanal (2) n- butyl alcohol			
	(3) n- propyl alcohol (4) Propanal			
56.	The reaction of			
	CH ₃ -CH=CH—OH with HBr gives :			
	(1) $CH_3CHBrCH_2$ —OH			
	(2) CH_3CH_2CHBr —OH			
1	(3) $CH_3CHBrCH_2$ —Br			
	(4) CH ₃ CH ₂ CHBr——Br			
57.	Among the following the one that gives positive Idoform test upon reaction with $\rm I_2$ and NaOH is :			
	(1) $CH_3CH_2CH(OH)CH_2CH_3$ (2) $C_6H_5CH_2CH_2OH$			
	(3) CH_3 CH_3 (4) $PhCHOHCH_3$			

Question No.	Questions					
58.	In the following sequence of reaction, identify the final product :					
. *	$CH_3\text{-Mg-Br} + \overbrace{} \xrightarrow{H_3O^+} A \xrightarrow{HBr} B \xrightarrow{Mg.ether} C \xrightarrow{CH_3CHO} D$					
	(1) CH ₃ CHOH CH ₃ C=O CH ₃					
	(3) \bigcirc CHOH-CH ₃ (4) \bigcirc CH ₂ OH \bigcirc CH ₃					
59.	The correct order of increasing acidic strength is -					
	(1) Phenol < Ethanol < Chloroacetic acid < Acetic acid					
	(2) Ethanol < Phenol < Chloroacetic acid < Acetic acid					
	(3) Ethanol < Phenol < Acetic acid < Chloroacetic acid					
83	(4) Chloroacetic acid < Acetic acid < Phenol < Ethanol					
60.	Among the following which one does not act as an intermediate in Hofmann rearrangement?					
	(1) RNCO (2) RCON:					
,	(3) RCON:HBr (4) RNC					

Question No.	Questions				
61.	Electrolytic reduction of nitrobenzene in weakly acidic medium gives:				
	(1) Aniline (2) Nitosobenzene				
	(3) N-phenylhydroxylamine (4) p-hydroxyaniline				
62.	The efficiency of fuel cell is given by				
	(1) $\frac{\Delta G}{\Delta S}$ (2) $\frac{\Delta G}{\Delta H}$				
	(3) $\frac{\Delta S}{\Delta G}$ (4) $\frac{\Delta H}{\Delta G}$				
63.	Thymine is:				
	(1) 5-methyluracil (2) 4-methyluracil				
	(3) 3-methyluracil (4) 1-methyluracil				
64.	If the rate of the reaction is equal to the rate constant, the order of the reaction is				
	(1) 0 (2) 1				
	(3) 2 (4) 3				
65.	Which of the following polymer can be formed by using the following monomer unit?				
	$H_{2}C$ $C = O$ $H_{2}C$ CH_{2} $H_{2}C - CH_{2}$				
	(1) Nylon 6, 6 (2) Nylon 2-nylon 6				
	(3) Melamine polymer (4) Nylon-6				

Question No.	Questions			
66.	Which of the following is not a target molecule for drug function in body?			
	(1) Carbohydrates (2) Lipids			
	(3) Vitamins (4) Proteins			
67.	The pollutants released by jet aeroplane in the atmosphere as fluorocarbons are called			
	(1) Photochemical oxidants			
	(2) Photochemical reductants			
	(3) Aerosols			
	(4) Physical pollutants			
68.	Which of the following pairs has the same size?			
t.	(1) Zn^{2+} , Hf^{4+} (2) Fe^{2+} , Ni^{2+}			
	(3) Zr^{4+} , Ti^{4+} (4) Zr^{4+} , Hf^{4+}			
69.	The coordination number and oxidation state number of Cr in $K_3Cr(C_2O_4)_3$ are respectively			
*	(1) 3 and + 3 (2) 3 and 0			
	(3) 6 and +3 (4) 4 and +2			
70.	Ionic solids, with Schottky defects, contain in their structure			
	(1) Cation vacancies only			
	(2) Cation vacancies and interstitial cations			
	(3) Equal number of cation and anion vacancies			
	(4) Anion vacancies and interstitial anions			

Question No.	Questions				
	Part-C {Opt. (i)} (Mathematics)				
71.	If A and B are any two sets, then $A - B \neq$				
	$(1) B \cap A' \qquad \qquad (2) A \cap B'$				
	(3) $(A' \cup B)'$ (4) None of these				
72.	Let R be the relation of the set R of all real numbers defined by aRb iff $ a-b \le 1$. Then R is				
	(1) reflexive and symmetric (2) symmetric only				
	(3) transitive only (4) anti-symmetric only				
73.	If $f(x) = \frac{x-1}{x+1}$, then $f\left(\frac{1}{f(x)}\right)$ equals:				
	(1) 0 (2) 1				
	(3) x (4) $\frac{1}{x}$				
74.	Which of the following is correct?				
	(1) $\sin 1^{\circ} > \sin 1$ (2) $\sin 1^{\circ} < \sin 1$				
	(3) $\sin 1^\circ = \sin 1$ (4) $\sin 1^\circ = \frac{\pi}{180} \sin 1$.				
75.	The cube roots of unity lie on a circle				
	(1) $ z-1 = 1$ (2) $ z+1 = 1$ (3) $ z = 1$ (4) None of these				
,	(3) $ z = 1$ (4) None of these				

Question No.	Questions			
76.	Area of the triangle formed by 3 complex numbers $1+i,i-1,2i$ in the Argand plane is			
÷	(1) $\frac{1}{2}$ (2) 1			
pe:	(3) $\sqrt{2}$ (4) 2			
77.	If the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common, then the value of k is:			
	(1) 3 (2) -3			
5	(3) 4 (4) None of these			
78.	The solution of the equation $1 + x - 1 \ge 0$ is:			
	(1) $(-\infty, 0)$ (2) $(-2, 0)$			
	(3) $(0, \infty)$ (4) $(0, 2)$			
79.	12 persons are to be arranged to a round table. If two particular persons among them are not to be side by side, the total number of arrangements is:			
	(1) 9 (10!) (2) 2 (10!)			
	(3) 2 (11!) (4) 10!			
80.	The positive integer just greater than $(1 + 0.0001)^{10000}$ is			
	(1) 3 (2) 4			
	(3) 5 (4) None of these			

Question No.	Questions				
81.	If H be the HM between a and b, then the value of $\frac{H}{a} + \frac{H}{b}$ is				
	$(1) \frac{ab}{a+b} \qquad (2) \frac{a+b}{ab}$				
	(3) 2 (4) None of these				
82.	The straight lines $x + y = 0$, $3x + y - 4 = 0$, $x + 3y - 4 = 0$ form a triangle which is:				
	(1) right angled (2) equilateral				
	(3) isosceles (4) none of these				
83.	The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis is of length:				
	(1) 3 (2) 4				
	(3) 7 (4) 1				
84.	The value of $\lim_{x \to \infty} \left(\frac{x+3}{x-1} \right)^{x+3}$ is				
	(1) e (2) e^2				
	(3) e^3 (4) e^4				
85.	If there are 6 girls and 5 boys who sit in a row, then the probability that no two boys sit together is:				
	(1) $\frac{6! \ 7!}{2! \ 11!}$ (2) $\frac{5! \ 7!}{2! \ 11!}$				
	(3) $\frac{6! \ 6!}{2! \ 11!}$ (4) None of these				

Question No.	Questions				
86.	The one which is the measure of central tendency is:				
	(1) co-efficient of correlation (2) standard deviation				
	(3) mean deviation (4) mode				
87.	If S be a finite set containing n elements. The the total number of binary operations on S is :				
	(1) n^n (2) 2^{n^2}				
	(3) n^2 (4) n^{n^2}				
88.	The solution of the equation $tan^{-1}(1+x) + tan^{-1}(1-x) = \frac{\pi}{2}$ is:				
	(1) $x = 1$ (2) $x = -1$				
	(3) $x = 0$ (4) $x = \pi$				
89.	If $A = [a \ b]$, $B = [-b \ -a]$ and $C = \begin{bmatrix} a \\ -a \end{bmatrix}$, then the correct statement				
	is:				
	(1) $A = -B$ (2) $A + B = A - B$				
	$(3) AC = BC \qquad (4) CA = CB$				
90.	The value of λ and μ for which the system of equations $x+y+z=6$, $x+2y+3z=10$ and $x+2y+\lambda z=\mu$ have unique solution are :				
	(1) $\lambda \neq 3, \ \mu \in \mathbb{R}$ (2) $\lambda = 3, \ \mu = 10$				
	(3) $\lambda \neq 3, \ \mu = 10$ (4) $\lambda \neq 3, \ \mu \neq 10$				

Question No.	Questions				
91.	The largest value of a third order determinant whose elements are 0 or 1				
/	is:				
	(1) 3 (2) 2 (3) 1 (4) 0				
	(3) 1 (4) 0				
92.	The set of all points, where the function $f(x) = \frac{x}{1+ x }$ is differentiable				
-	is:				
	$(1) (0, \infty) \qquad \qquad (2) (-\infty, \infty)$				
	(3) $(-\infty, 0) \cup (0, \infty)$ (4) None of these				
93.	The function f (x) is defined by				
	$f(x) = \begin{cases} \frac{ x+2 }{\tan^{-1}(x+2)}, & x \neq -2 \\ 2, & x = -2 \end{cases}, \text{ then}$				
	f(x) is:				
	(1) continuous at $x = -2$				
8	(2) differentiable at $x = -2$				
	(3) not continuous at $x = -2$				
	(4) continuous but not derivable at $x = -2$				
94.	If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A \cos 4x + B$, then				
	(1) $A = -\frac{1}{8}$ (2) $A = -\frac{1}{4}$ (3) $A = -\frac{1}{2}$ (4) -1				
	(3) $A = -\frac{1}{2}$ (4) -1				
95.	The area of the figure bounded by $y = \sin x$, $y = \cos x$ in the first quadrant is:				
	(1) $2(\sqrt{2}-1)$ (2) $\sqrt{3}+1$ (3) $2(\sqrt{3}-1)$ (4) None of these				
	(3) $2(\sqrt{3}-1)$ (4) None of these				

Question No.	Questions				
96.	The order of the differential equation whose solution is				
	$y = a \cos x + b \sin x + c e^{-x}$ is				
	(1) 2		(2)	1	
	(3) 3		(4)	None of these	
97.	If $\vec{r} = x$	$\hat{i} + y \hat{j} + z \hat{k}$, then value of	(ř. î	$(\hat{i} + (\vec{r} \cdot \hat{j}) \hat{j} + (\vec{r} \cdot \hat{k}) \hat{k}$ is	
	(1) 0		(2)	3 r	
,	(3) 87	•	(4)	r ·	
98.	The vectors $2\hat{i}+3\hat{j}-4\hat{k}$ and $a\hat{i}+b\hat{j}+c\hat{k}$ are perpendicular when:				
3	(1) a =	= 2, b = 3, c = 4	(2)	a = 4, $b = 4$, $c = -2$	
	(3) a	= 5, b = 4, c = 4	(4)	a = 4, b = 4, c = 5	
99.	A fair coin is tossed 100 times. The probability of getting tails an odd number of times is:				
	(1) 3/8	8	(2)	$\frac{1}{2}$	
	(3) 1/3	8	(4)	None of these	
100.	The eq	uation $ \vec{r} ^2 - 2(\vec{r} \cdot \vec{a}) + \lambda =$	0 re	epresents a	
	(1) pl	ane	(2)	straight line	
	(3) sp	ohere	(4)	none of these	

Question No.	Questions				
	Part-C {Opt. (ii)} (Biology)				
101.	Genetic engineering is connected with				
	(1) Eugenics (2) Euthenics				
	(3) Euphenics (4) All of these				
102.	Some people who have suffered from a disease may not be affected again during their life time; such immunity is called				
	(1) Natural immunity (2) Acquired immunity				
	(3) Innate immunity (4) Passive immunity				
103.	Raw cheese is known as				
	(1) Blue cheese (2) Cottage cheese				
	(3) Swiss cheese (4) None of these				
104.	Cell division cannot be stopped in which phase of the cell cycle?				
	(1) G ₁ -Phase (2) G ₂ -Phase				
	(3) S-Phase (4) Prophase				
105.	What type of plant is formed when colchicine is used in the process of development of Raphanobrassica?				
	(1) Autotetraploid (2) Haploid				
	(3) Triploid (4) Allotetraploid				

Question No.	Questions				
106.	Synapsis occurs between				
/	(1) mRNA and ribosomes				
	(2) male and female gametes				
220	(3) Two homologous chromosomes				
e .	(4) Spindle fibers and centromere				
107.	A nitrogen fixing microbe associated with Azolla in rice fields is				
	(1) Frankia (2) Tolypothrix				
0 20	(3) Spirulina (4) Anabaena				
108.	A patient brought to a hospital with myocardial infarction is normally immediately given				
	(1) Cyclosporin-A (2) Statins				
	(3) Penicillin (4) Streptokinase				
109.	Rotenone is				
	(1) A bioherbicide (2) A natural insecticide				
	(3) An insect hormone (4) A natural herbicide				
110.	Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as				
	(1) Genetic flow (2) Genetic drift				
	(3) Random mating (4) Genetic load				

The tendency of population to remain in genetic equilibrium may be
disturbed by
(1) Random mating (2) Lack of migration
(3) Lack of mutation (4) Lack of random mating
If two pea plants having red (Dominant) colored flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red colored flowers will be
(1) Both heterozygous
(2) One homozygous and other heterozygous
(3) Both homozygous
(4) Both hemizygous
The deposition of lipids on the wall lining the lumen of large and medium sized arteries is referred to as
(1) Osteoarthritis (2) Osteoporosis
(3) Stokes-Adams Syndrome (4) Atherosclerosis
Which of the following matches correctly?
(1) Pulmonary artery - Carries deoxygenated blood to the lungs
(2) Superior vena cava – Receives deoxygenated blood from the lower body and organs
(3) Inferior vena cava – Receives deoxygenated blood from the head and body
(4) Hepatic artery – carries deoxygenated blood to the gut

Question No.	Questions				
115.	The function of leghemoglobin in the root nodules of legumes is				
	(1) Oxygen removal				
	(2) Inhibition of nitrogenase activity				
	(3) Expression of nif gene				
	(4) Nodule differentiation				
116.	GIFT (Gamete intrafallopian transfer) mixes egg and sperm in the				
	(1) Fallopian tube (2) Uterus				
	(3) Vagina (4) Culture medium				
117.	An example of merocrine gland is				
	(1) Sebaceous gland (2) Pineal gland				
	(3) Salivary gland (4) Mammary gland				
118.	ATPase enzyme needed for muscle contraction is located in				
2 8 7	(1) Actinin (2) Troponin				
	(3) Myosin (4) Actin				
119.	Casparian strips are present in the of the root.				
	(1) Pericycle (2) Cortex				
	(3) Epiblema (4) Endodermis				

Question No.	Questions				
120.	The	The inner, darker and harder portion of secondary xylem that cannot conduct water, in an older dicot stem, is called			
	(1)	Bast	(2)	Alburnum	
	(3)	Duramen	(4)	Wood	
121.	See	d coat is not thin, membra	nous	in	
	(1)	Groundnut	(2)	Coconut	
	(3)	Maize	(4)	Gram	
122.	Len	ticels are involved in			
	(1)	Transportation	(2)	Gaseous exchange	
	(3)	Food transport	(4)	Photosynthesis	
123.	Insect mouthparts are adapted for different functions in different species. Mouthparts of houseflies are used for				
5.	(1)	Siphoning			
8	(2)	Piercing and sucking		* ,	
	(3)	Sponging and lapping			
190	(4)	Biting and chewing			
124.	The	first enzyme to be purified	and	crystalized was	
	(1)	Urease	(2)	Diastase	
	(3)	Insulin	(4)	Zymase	

Question No.	Questions				
125.	Many enzymes are secreted in inactive form to protect				
ė	(1) Cell membrane (2) Mitochondria				
7	(3) Cell proteins (4) Cell DNA				
126.	An action potential in the nerve fiber is produced when positive and negative charges on outside and the inside of the axon membrane are reversed because				
	(1) All potassium ions leave the axon				
	(2) More potassium ions enter the axon as compared to sodium ions leaving it				
*	(3) More sodium ions enter the axon as compared to potassium ions leaving it				
	(4) All soidum ions enter the axon				
127.	Sequence of taxonomic categories is				
	(1) Divison – Class – Order – Family – Tribe – Genus – Species				
	(2) Class – Phylum – Tribe – Order – Family – Genus – Species				
	(3) Phylum – Order – Class – Tribe – Family – Genus – Species				
	(4) Division – Class – Family – Tribe – Order – Genus – Species				
128.	In the five-kingdom system of classification, which single kingdom out of the following can include blue green algae, nitrogen-fixing bacteria and methanogenic archaebacteria?				
	(1) Protista (2) Fungi				
	(3) Monera (4) Plantae				

Question No.	Questions
129.	Methanogens are
	(1) Obligate anaerobic bacteria
	(2) Aerobic fungi
	(3) Aerobic bacteria
	(4) Obligate anaerobic fungi
130.	Noise is measured using sound meter and the unit is
	(1) Hertz
	(2) Decibel
	(3) Joule
	(4) Sound

(PDH EE 2040)

(BPH-EE-2019)

Code

sr. No. 10158

| SET-"Z" | Time: 1½ | Hours (75 minutes) | Total Questions: 130 | Max. Marks: 100 | Candidate's Name: ______ | Date of Birth: _____ | Father's Name: _____ | Mother's Name: _____ | (in figure) | (in words) | Date of Examination: _____ |

(Signature of the Invigilator)

(Signature of the candidate)

CANDIDATES MUST READ THE FOLLOWING INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER & FOLLOW THEM.

- 1. All questions under Part-A and Part-B are compulsory. Part-C is optional. The candidates may attempt either Optional Part-C (i) OR Optional Part-C(ii). All questions carry equal marks i.e. one mark each.
- 2. The candidate MUST return this question book-let and the OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- 3. The candidate MUST NOT do any rough work OR writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself.
- 4. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 5. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
- 6. Use only Blue or Black <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 7. There will be no negative marking. Each correct answer will be awarded one full mark Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 8. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE QUESTION BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER THE START OF EXAMINATION.



Question No.	Questions			
	Part-A (Physics)			sics)
1.	The	e blue colour of sky is du	ie to	
	(1)	Reflection of light	(2)	Refraction of light
	(3)	Scattering of light	(4)	Diffraction of light
2.	If t rati will	to of intensity of maxim	of intens na and r	sity ratio 25:1 interfere, then the minima in the interference pattern
	(1)	3:2	(2)	9:4
	(3)	5:1	(4)	25:1
3.	Nuc	clear force between two	nucleons	depends on their
	(1)	Mass	(2)	Charge
	(3)	Spin	(4)	Both (2) and (3)
4.	Charge on a n-type semiconductor is			
	(1)	Zero	(2)	Negative
, T	(3)	Positive	(4)	10 ⁻⁶ coulomb
5.	If a zener diode has 9.1 V break down voltage with a maximum power dissipation of 273 mW, then maximum current that can pass through zener diode is			
	(1)	40 mA	(2)	30 mA
	(3)	20 mA	(4)	10 mA

Question No.	Questions			
6.	Lenz's law in electromagnetic induction follows law of conservation of			
	(1) Charge (2) Energy			
	(3) Linear momentum (4) Angular momentum			
7.	Resistance offered by a Capacitor to D.C. is			
	(1) zero (2) negative			
	(3) positive (4) infinite			
8.	Mechanical analogue of inductance is			
	(1) Displacement (2) Velocity			
	(3) Energy (4) Mass			
9.	The classification of Electromagnetic spectrum is roughly based upon			
	(1) How the waves are produced			
	(2) How the waves are detected			
	(3) Both (1) and (2)			
	(4) Wavelength of waves			
10.	If the atmosphere of earth suddenly disappears then duration of day will			
	(1) Increase by 4 minutes (2) Decrease by 4 minutes			
	(3) No change (4) Can't be predicted			

Question No.	Questions				
11.	Two iron spheres, A (a solid sphere) and B (a hollow sphere), are charged to same potential. Which of the two hold more energy?				
	(1)	A	(2)	B	
	(3)	Both have same	(4)	Can't be predicted	
12.	Two	bulbs A and B of 25 watt a connected in series with a s	nd 1 uppl	00 watt, respectively, rated at 220 V, y of 440 V. Which bulb will fuse?	
	(1)	A	(2)	В	
	(3)	Both will fuse	(4)	None will fuse	
13.	Whe	en a charge particle moves nge in	thro	ugh a magnetic field, it may suffer a	
	(1)	Energy	(2)	Mass	
	(3)	Speed	(4)	Velocity	
14.	Two electrons are moving parallel to each other in free space, then the force between them will be				
13	(1)	Attractive	(2)	Repulsive	
	(3)	No force	(4)	Can't say anything	
15.	Cur	rent used for electrolysis is			
	(1)	D.C.	(2)	A.C.	
	(3)	Both of these	(4)	None of these	

Question No.	Questions				
16.	A thin uniform circular discuss rolling down an inclined plane of inclination 30° without slipping. Its linear acceleration along the plane is				
	(1) g/4 (2) g/3				
	(3) g/2 (4) 2g/3				
17.	A projectile, fired vertically upwards with a speed v escapes from the earth. If it is to be fired at 45° to the horizontal, what should be its speed so that it escapes from the earth?				
	(1) v (2) $v/\sqrt{2}$				
	(3) $\sqrt{2} \text{ V}$ (4) 2v				
18.	Which of the following substances has negligible elastic fatigue?				
	(1) glass (2) copper				
	(3) quartz (4) silver				
19.	The modulus of rigidity of water is				
	(1) zero (2) 1				
*	(3) 81 (4) infinite				
20.	The surface tension does not depend upon				
	(1) Nature of liquid (2) Temperature				
	(3) Presence of impurity (4) Atmospheric Pressure				

Question No.	Questions					
21.	A small insect enters the eye of person riding a bike, the person then applies sudden brakes to his bike without rubbing his eye and he found that the small insect got out of his eye. By which law of physics the small insect got out of eye					
	(1) Newton's third law of motion (2) Newton's second law of motion					
	(3) Newton's first law of motion (4) Newton's law of Gravitation					
22.	Two bodies with masses m_1 and m_2 ($m_1 > m_2$) are joined by a massless string passing over fixed pulley. The centres of gravity of the two masses are initially at same height. Assume the pulley to be weightless. Then the downward acceleration of mass m_1 is					
	(1) $\frac{m_1}{m_1 + m_2} g$ (2) $\frac{m_2}{m_1 + m_2} g$					
	(3) $\frac{m_1 - m_2}{m_1 + m_2} g$ (4) $\left[\frac{m_1 - m_2}{m_1 + m_2} \right]^2 g$					
23.	A block of mass 1 kg lies on a horizontal surface in a truck. The coefficient of static friction between the block and the surface is 0.6. If the acceleration of truck is 5 ms ⁻² , the frictional force acting on the block is					
	(1) 4 N (2) 5 N					
	(3) 6 N (4) 10 N					
24.	Two balls of different mass have same kinetic energy. The ball having greater momentum will be					
	(1) Heavier one (2) Lighter one					
	(3) Both have same (4) Can't say					
25.	The moment of inertia of a ring of mass M and radius R about an axis through the diameter in its plane will be					
	(1) $0.5 \mathrm{MR^2}$ (2) $\mathrm{MR^2}$					
	(3) $1.5 \mathrm{MR^2}$ (4) $2 \mathrm{MR^2}$					

Question No.	Questions					
26.	The strength of Weak nuclear force relative to Electromagnetic force is of the order of					
	(1)	10-13	(2)	10-11		
	(3)	1013	(4)	1011		
27.	Par	sec is unit of				
	(1)	Mass	(2)	Length		
	(3)	Time	(4)	Frequency		
28.		adius of earth contra ains same then the		f its actual value and mass of earth due to gravity will		
	(1)	Decrease by 2%	(2)	Decrease by 4%		
	(3)	Increase by 2%	(4)	Increase by 4%		
29.	The position of an object moving along X-axis is given by $x = A + Bt^2$, where $A = 10$ m, $B = 2.5$ ms ⁻² , and t is measured in seconds. The average velocity of this object between $t = 1$ s and $t = 3$ s is					
	(1)	10 ms ⁻¹	(2)	15 ms ⁻¹		
v e	(3)	20 ms ⁻¹	(4)	25 ms ⁻¹		
30.	A ball is thrown at a speed 28 ms ⁻¹ in a direction 30° above the horizontal. The maximum height attained by the ball will be					
	(1)	25 m	(2)	20 m		
-	(3)	10 m	(4)	5 m		

Question No.	Questions			
31.	A sample of oxygen and a sample of hydrogen have same mass, volume and pressure. The ratio of their absolute temperature is			
	(1)	1/16	(2)	1/4
	(3)	4	(4)	16
32.	The	internal energy of a gas wil	l incı	ease when it
	(1)	Expands adiabatically	(2)	Is compressed adiabatically
	(3)	Expands isothermally	(4)	Is compressed isothermally
33.		ne absolute temperature of a ntity of heat radiated per se	_	fect black body be doubled, then the increases by
	(1)	Two times	(2)	Four times
	(3)	Eight times	(4)	Sixteen times
34.		-		ergoing S.H.M. is 16 s. It starts its its velocity is 0.4 ms ⁻¹ , the amplitude
	(1)	2.88 m	(2)	1.44 m
	(3)	0.72 m	(4)	0.36 m
35.	The	e speed of wave represented	by y	$y = A \sin (\omega - kx)$ is
	(1)	k/ω	(2)	ω/k
	(3)	ωk	(4)	1/ωk

Question No.	Questions			
		Part-B (C	hem	istry)
36.	Whi		a ta	rget molecule for drug function in
	(1)	Carbohydrates	(2)	Lipids
	(3)	Vitamins	(4)	Proteins
37.		pollutants released by jet ae called	ropla	ne in the atmosphere as fluorocarbons
	(1)	Photochemical oxidants		
	(2)	Photochemical reductants		•
	(3)	Aerosols		
	(4)	Physical pollutants		
38.	Whi	ch of the following pairs ha	s the	same size?
и	(1)	Zn ²⁺ , Hf ⁴⁺	(2)	Fe ²⁺ , Ni ²⁺
	(3)	Zr ⁴⁺ , Ti ⁴⁺	(4)	Zr ⁴⁺ , Hf ⁴⁺
39.	1	coordination number and or respectively	xidat	ion state number of Cr in $K_3Cr(C_2O_4)_3$
	(1)	3 and + 3	(2)	3 and 0
	(3)	6 and + 3	(4)	4 and + 2
40.	Ioni	c solids, with Schottky def	ects,	contain in their structure
	(1)	Cation vacancies only		
	(2)	Cation vacancies and inte	rstitia	al cations
	(3)	Equal number of cation ar	ıd ani	on vacancies
	(4)	Anion vacancies and inter	stitia	l anions

Question No.	Questions			
41.	Elec	ctrolytic reduction of nitrobenz	zen	e in weakly acidic medium gives :
	(1)	Aniline (2	2)	Nitosobenzene
-	(3)	N-phenylhydroxylamine (4	1)	p-hydroxyaniline
42.	The	efficiency of fuel cell is given	by	
	(1)	$\frac{\Delta G}{\Delta S}$ (2)	2)	$\frac{\Delta G}{\Delta H}$
,	(3)	$\frac{\Delta S}{\Delta G}$ (4)	4)	$\frac{\Delta H}{\Delta G}$
43.	Thy	mine is :		
	(1)	5-methyluracil (2	2)	4-methyluracil
	(3)	3-methyluracil (4	4)	1-methyluracil
44.		he rate of the reaction is equa	ıl t	o the rate constant, the order of the
	(1)	0 , (2)	1
	(3)	2 (4)	3
45.		nich of the following polymer nomer unit?	ca	n be formed by using the following
		H ₂ C N C	ے(H ₂	O .
		н,с—сн	2	
	(1)	Nylon 6, 6	2)	Nylon 2-nylon 6
	(3)	Melamine polymer ((4)	Nylon-6

Question No.	Questions		
46.	The reaction of		
	CH ₃ -CH=CH—OH with HBr gives :		
	(1) $CH_3CHBrCH_2$ —OH		
	(2) CH_3CH_2CHBr —OH		
	(3) $CH_3CHBrCH_2$ —Br		
	(4) CH ₃ CH ₂ CHBr—Br		
47.	Among the following the one that gives positive Idoform test upon reaction with ${\rm I_2}$ and NaOH is :		
	(1) $CH_3CH_2CH(OH)CH_2CH_3$ (2) $C_6H_5CH_2CH_2OH$		
	(3) CH_3 CH_3 (4) $PhCHOHCH_3$		
48.	In the following sequence of reaction, identify the final product:		
	$CH_3\text{-Mg-Br} + \underbrace{\bigcirc}_O \xrightarrow{H_3O^+} A \xrightarrow{HBr} B \xrightarrow{Mg.ether} C \xrightarrow{CH_3CHO} D$		
	(1) CH ₃ CHOH CH ₃ C=O CH ₃		
	(3) CHOH-CH ₃ (4) CH ₂ OH		

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Question No.	Questions		
49.	The correct order of increasing acidic strength is -		
	(1) Phenol < Ethanol < Chloroacetic acid < Acetic acid		
	(2) Ethanol < Phenol < Chloroacetic acid < Acetic acid		
	(3) Ethanol < Phenol < Acetic acid < Chloroacetic acid		
j.	(4) Chloroacetic acid < Acetic acid < Phenol < Ethanol		
50.	Among the following which one does not act as an intermediate in Hofmann rearrangement?		
	(1) RNCO (2) RCON:		
	(3) RCON:HBr (4) RNC		
51.	Ortho and para hydrogen differ in		
	(1) atomic number (2) mass number		
	(3) electron spin in two atoms (4) nuclear spin in two atoms		
52.	Which of the following carbonates is least stable		
	(1) $MgCO_3$ (2) Na_2CO_3		
	(3) K_2CO_3 (4) Rb_2CO_3		
53.	The IUPAC name of the		
	Me Me Me Me		
	Structure is:		
	(1) 2,4,5-triethyl-3-nonene (2) 5,6-diethyl-3-methyl-4-decene		
	(3) 2,4,6-triethyl-3-octene (4) 3-ethyl-5-methyl-3-heptene		

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Question No.	Questions		
54.	The strongest base among the following is:		
	$(1) \bigcirc \\ N \qquad \qquad (2) \bigcirc \\ N \qquad \qquad \\ H \qquad \qquad $		
	(3) N H N H		
55.	The number of σ -and Π -bonds present in pent-4-ene-1-yne is :		
	(1) 10, 3 (2) 4, 9		
	(3) 3, 10 (4) 9, 4		
56.	The term that accounts for intramolecular force in van der Waal's equat for non-ideal gas is	tion	
	(1) RT (2) V-b		
	(3) $P + \frac{a}{V^2}$ (4) $(RT)^{-1}$		
57.	Which one of the following is not applicable to the phenomena of absorption		
	(1) $\Delta H > 0$ (2) $\Delta G < 0$		
	(3) $\Delta S < 0$ (4) $\Delta H < 0$		
58.	Which one of the following is a positively charged sol		
	(1) Gold sol (2) As_2S_3 sol		
	(3) Methylene blue sol (4) Gelatin		

Question No.	Questions			
59.	What is the normality of 1 M H ₃ PO ₂ solution?			solution?
	(1)	0.5 N	(2)	1.0 N
	(3)	2.0 N	(4)	3.0 N
60.		icket ball 0.5 Kg is moving ociated with its motion is		velocity of 100 ms ⁻¹ . The wavelength
	(1)	1/100 cm	(2)	$6.6 \times 10^{-34} \text{ m}$
	(3)	$1.32 \times 10^{-35} \text{ m}$	(4)	$6.6 \times 10^{-28} \text{ m}$
61.	, 25 mL of a solution of $Ba(OH)_2$ on titration with 0.1 M solution of $HC\ell$ gave a titre value of 35 mL. The molarity of barium hydroxide solution was			
	(1)	0.07	(2)	0.14
	(3)	0.28	(4)	0.35
62.	Ide	ntify the least stable amo	ng the f	following:
	(1)	Li ⁻	(2)	Be ⁻
	(3)	B-	(4)	C ⁻
63.	The	e correct order of size amo	ong Cℓ,	Cℓ ⁺ and Cℓ ⁻ is
	(1)	$C\ell^+ < C\ell^- < C\ell$	(2)	$C\ell^+ > C\ell^- > C\ell$
	(3)	$C\ell^+ < C\ell < C\ell^-$	(4)	$C\ell^- < C\ell < C\ell^+$

Question No.		Questions	
64.	The geometry of $C\ell O_4^-$ ion is	:	\neg
	(1) Pyramidal	(2) Tetrahedral	
	(3) Trigonal Planar	(4) Trigonal bipyramidal	SE
65.	The number of orbitals in a su	ibshell is equal to	
	(1) $2\ell - 1$	(2) 2\ell	
	(3) ℓ^2	(4) $2\ell + 1$	
66.	Which alkene on ozonolysis gi	ves CH ₃ CH ₂ CHO and CH ₃ COCH ₃ ?	
	(1) $CH_3CH_2CH=C(CH_3)_2$	(2) CH ₃ CH ₂ CH=CHCH ₂ CH ₃	
	(3) CH ₃ CH ₂ CH=CHCH ₃	(4) $CH_3C(CH_3)=CHCH_3$	
67.	$ \underbrace{\text{NBS}}_{\text{NBS}} \land \underbrace{\text{NaC} \equiv \text{CH}}_{\text{B}} \land \text{B} $, what are A and B:	
	(1) H $C \equiv CH$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	*
	(3) Br	(4) None of them	

Question No.	Questions		
68.	Identify the compound Y in the following reaction:		
	$ \begin{array}{c} NH_{2} \\ \hline NaNO_{2} + HC\ell \\ \hline 273-278 K \end{array} $ $ \begin{array}{c} N_{2}^{+}C\ell^{-} \\ \hline Cu_{2}C\ell_{2} \\ \hline Y + N_{2} \end{array} $		
	$(1) \bigcirc^{C\ell} \qquad \qquad (2) \bigcirc$		
	$(3) \qquad \qquad (4) \qquad \overset{C\ell}{\bigoplus}$		
	Ct		
69.	Which reagent will you use for the following reaction?		
	$\mathrm{CH_3CH_2CH_2CH_3} \rightarrow \mathrm{CH_3CH_2CH_2CH_2C\ell} + \mathrm{CH_3CH_2CHC\ellCH_3}$		
	(1) $C\ell_2/UV$ light (2) $NaC\ell + H_2SO_4$		
	(3) $C\ell_2$ gas in dark (4) $C\ell_2$ gas in the presence of iron in dark		
70.	In the following sequence of reaction:		
	$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$		
	The compound D is:		
	(1) Butanal (2) n- butyl alcohol		
	(3) n- propyl alcohol (4) Propanal		

Question No.	Questions		
	Part-C {Opt. (i)} (Mathematics)		
71.	The order of the differential equation whose solution is		
	$y = a \cos x + b \sin x + c e^{-x}$ is		
	(1) 2 (2) 1		
	(3) 3 (4) None of these		
72.	If $\vec{r} = x \hat{i} + y \hat{j} + z \hat{k}$, then value of $(\vec{r} \cdot \hat{i}) \hat{i} + (\vec{r} \cdot \hat{j}) \hat{j} + (\vec{r} \cdot \hat{k}) \hat{k}$ is		
	(1) 0 (2) $3\vec{r}$		
	$(3) 8\vec{r} \qquad \qquad (4) \vec{r}$		
73.	The vectors $2\hat{i}+3\hat{j}-4\hat{k}$ and $a\hat{i}+b\hat{j}+c\hat{k}$ are perpendicular when:		
	(1) $a = 2, b = 3, c = 4$ (2) $a = 4, b = 4, c = -2$		
	(3) $a = 5, b = 4, c = 4$ (4) $a = 4, b = 4, c = 5$		
74.	A fair coin is tossed 100 times. The probability of getting tails an odd number of times is:		
	(1) $\frac{3}{8}$ (2) $\frac{1}{2}$		
	(3) $\frac{1}{8}$ (4) None of these		
75.	The equation $ \vec{r} ^2 - 2(\vec{r} \cdot \vec{a}) + \lambda = 0$ represents a		
	(1) plane (2) straight line		
	(3) sphere (4) none of these		

Question No.	Questions		
76.	The largest value of a third order determinant whose elements are 0 or 1 is:		
	(1) 3 (2) 2		
	(3) 1 (4) 0		
77.	The set of all points, where the function $f(x) = \frac{x}{1+ x }$ is differentiable		
	is:		
	(1) $(0, \infty)$ (2) $(-\infty, \infty)$ (3) $(-\infty, 0) \cup (0, \infty)$ (4) None of these		
78.			
10.	The function f (x) is defined by		
	$f(x) = \begin{cases} \frac{ x+2 }{\tan^{-1}(x+2)}, & x \neq -2 \\ 2, & x = -2 \end{cases}, \text{ then}$		
	f(x) is:		
	(1) continuous at $x = -2$		
	(2) differentiable at $x = -2$		
	(3) not continuous at $x = -2$		
	(4) continuous but not derivable at $x = -2$		
79.	If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A \cos 4x + B$, then		
	(1) $A = -\frac{1}{8}$ (2) $A = -\frac{1}{4}$ (3) $A = -\frac{1}{2}$ (4) -1		
	(3) $A = -\frac{1}{2}$ (4) -1		
80.	The area of the figure bounded by $y = \sin x$, $y = \cos x$ in the first quadrant is:		
	(1) $2(\sqrt{2}-1)$ (2) $\sqrt{3}+1$		
	(1) $2(\sqrt{2}-1)$ (2) $\sqrt{3}+1$ (3) $2(\sqrt{3}-1)$ (4) None of these		

Question No.	(Questions
81.	If A and B are any two sets, the	en A − B ≠
	$(1) B \cap A'$	(2) A ∩ B'
	(3) (A' ∪ B)'	(4) None of these
82.	Let R be the relation of the set $ a-b \le 1$. Then R is	t R of all real numbers defined by aRb iff
	(1) reflexive and symmetric	(2) symmetric only
	(3) transitive only	(4) anti-symmetric only
83.	If $f(x) = \frac{x-1}{x+1}$, then $f\left(\frac{1}{f(x)}\right)$	equals:
	(1) 0	(2) 1
	(3) x	(4) 1/ _x
84.	Which of the following is corre	ect?
	$(1) \sin 1^{\circ} > \sin 1$	$(2) \sin 1^{\circ} < \sin 1$
	$(3) \sin 1^\circ = \sin 1$	(4) $\sin 1^{\circ} = \frac{\pi}{180} \sin 1.$
85.	The cube roots of unity lie on a	a circle
	(1) z-1 = 1	(2) $ z+1 =1$
	(3) z = 1	(4) None of these

Question No.	Questions		
86.	If H be the HM between a and b, then the value of $\frac{H}{a} + \frac{H}{b}$ is		
	$(1) \frac{ab}{a+b} \qquad (2) \frac{a+b}{ab}$		
	(3) 2 (4) None of these		
87.	The straight lines $x + y = 0$, $3x + y - 4 = 0$, $x + 3y - 4 = 0$ form a triangle which is:		
	(1) right angled (2) equilateral		
	(3) isosceles (4) none of these		
88.	The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis is of length:		
	(1) 3 (2) 4		
	(3) 7 (4) 1		
89.	The value of $\lim_{x \to \infty} \left(\frac{x+3}{x-1} \right)^{x+3}$ is		
	(1) e (2) e^2		
	(3) e^3 (4) e^4		
90.	If there are 6 girls and 5 boys who sit in a row, then the probability that no two boys sit together is:		
	(1) $\frac{6! \ 7!}{2! \ 11!}$ (2) $\frac{5! \ 7!}{2! \ 11!}$		
	(3) $\frac{6! \ 6!}{2! \ 11!}$ (4) None of these		

Question No.	Questions		
91.	Area of the triangle formed by 3 complex numbers $1 + i$, $i - 1$, $2i$ in the Argand plane is		
	(1) $\frac{1}{2}$	(2)	1
	(3) $\sqrt{2}$	(4)	2
92.		ns $2x^2 + kx - 5 = 0$ a the value of k is:	nd $x^2 - 3x - 4 = 0$ have one root in
	(1) 3	(2)	-3
	(3) 4	(4)	None of these
93.	The solution o	f the equation $1 + x $	$-1 \mid \geq 0 \text{ is}$:
	(1) $(-\infty, 0)$ (3) $(0, \infty)$	(2)	(-2, 0)
-	(3) $(0, \infty)$	(4)	(0, 2)
94.			ound table. If two particular persons le, the total number of arrangements
	(1) 9 (10!)	(2)	2 (10 !)
	(3) 2 (11!)	(4)	10!
95.	The positive in	nteger just greater tha	an $(1 + 0.0001)^{10000}$ is
	(1) 3	(2)	4
	(3) 5	(4)	None of these

Question No.	Questions		
96.	The one which is the measure of central tendency is:		
	(1) co-efficient of correlation (2) standard deviation		
	(3) mean deviation (4) mode		
97.	If S be a finite set containing n elements. The the total number of binary operations on S is :		
	(1) n^n (2) 2^{n^2}		
	(1) n^n (2) 2^{n^2} (3) n^2 (4) n^{n^2}		
98.	The solution of the equation $\tan^{-1}(1+x) + \tan^{-1}(1-x) = \frac{\pi}{2}$ is:		
	(1) $x = 1$ (2) $x = -1$		
	(3) $x = 0$ (4) $x = \pi$		
99.	If $A = [a \ b]$, $B = [-b \ -a]$ and $C = \begin{bmatrix} a \\ -a \end{bmatrix}$, then the correct statement		
	is:		
	(1) $A = -B$ (2) $A + B = A - B$		
	(3) AC = BC (4) CA = CB		
100.	The value of λ and μ for which the system of equations $x+y+z=6$, $x+2y+3z=10$ and $x+2y+\lambda z=\mu$ have unique solution are :		
	(1) $\lambda \neq 3, \ \mu \in \mathbb{R}$ (2) $\lambda = 3, \ \mu = 10$		
	(3) $\lambda \neq 3, \ \mu = 10$ (4) $\lambda \neq 3, \ \mu \neq 10$		

Question No.	Questions			
	Part-C {Opt. (ii)} (Biology)			
101.	An action potential in the nerve fiber is produced when positive and negative charges on outside and the inside of the axon membrane are reversed because			
	(1) All potassium ions leave the axon			
	(2) More potassium ions enter the axon as compared to sodium ions leaving it			
z	(3) More sodium ions enter the axon as compared to potassium ions leaving it			
	(4) All soidum ions enter the axon			
102.	Sequence of taxonomic categories is			
	(1) Divison - Class - Order - Family - Tribe - Genus - Species			
	(2) Class - Phylum - Tribe - Order - Family - Genus - Species			
	(3) Phylum – Order – Class – Tribe – Family – Genus – Species			
	(4) Division – Class – Family – Tribe – Order – Genus – Species			
103.	In the five-kingdom system of classification, which single kingdom out of the following can include blue green algae, nitrogen-fixing bacteria and methanogenic archaebacteria?			
2	(1) Protista (2) Fungi			
	(3) Monera (4) Plantae			

Question No.	Questions		
104.	Methanogens are		
	(1) Obligate anaerobic bacteria		
	(2) Aerobic fungi		
	(3) Aerobic bacteria		
	(4) Obligate anaerobic fungi		
105.	Noise is measured using sound meter and the unit is		
	(1) Hertz		
	(2) Decibel		
	(3) Joule		
	(4) Sound	•	
106.	Seed coat is not thin, membranous in		
	(1) Groundnut (2) Coconut	¥ ×	
	(3) Maize (4) Gram		
107.	Lenticels are involved in		
	(1) Transportation (2) Gaseous exchang	çe	
	(3) Food transport (4) Photosynthesis		
108.	Insect mouthparts are adapted for different functions i Mouthparts of houseflies are used for	n different species.	
	(1) Siphoning		
	(2) Piercing and sucking		
	(3) Sponging and lapping		
	(4) Biting and chewing		

Code-B

Question No.	Questions		
109.	The first enzyme to be purified and crystalized was		
	(1) Urease	(2)	Diastase
	(3) Insulin	(4)	Zymase
110.	Many enzymes are secreted	d in inact	ive form to protect
	(1) Cell membrane	(2)	Mitochondria
	(3) Cell proteins	(4)	Cell DNA
111.	Genetic engineering is conr	nected wit	th
	(1) Eugenics	(2)	Euthenics
	(3) Euphenics	(4)	All of these
112.	Some people who have suffered from a disease may not be affected again during their life time; such immunity is called		
	(1) Natural immunity	(2)	Acquired immunity
	(3) Innate immunity	(4)	Passive immunity
113.	Raw cheese is known as		
	(1) Blue cheese	(2)	Cottage cheese
	(3) Swiss cheese	(4)	None of these

Question No.	Questions		
114.	Cell division cannot be stopped in which phase of the cell cycle?		
	(1) G ₁ -Phase (2) G ₂ -Phase		
	(3) S-Phase (4) Prophase		
115.	What type of plant is formed when colchicine is used in the process of development of Raphanobrassica?		
	(1) Autotetraploid (2) Haploid		
	(3) Triploid (4) Allotetraploid		
116.	The tendency of population to remain in genetic equilibrium may be disturbed by		
	(1) Random mating (2) Lack of migration		
,	(3) Lack of mutation (4) Lack of random mating		
117.	If two pea plants having red (Dominant) colored flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red colored flowers will be		
	(1) Both heterozygous		
	(2) One homozygous and other heterozygous		
	(3) Both homozygous		
	(4) Both hemizygous		
118.	The deposition of lipids on the wall lining the lumen of large and medium sized arteries is referred to as		
٠	(1) Osteoarthritis (2) Osteoporosis		
	(3) Stokes-Adams Syndrome (4) Atherosclerosis		

Question No.	Questions			
119.	Which of the following matches correctly?			
	(1) Pulmonary artery – Carries deoxygenated blood to the lungs			
	(2) Superior vena cava – Receives deoxygenated blood from the lower body and organs			
	(3) Inferior vena cava – Receives deoxygenated blood from the head and body			
	(4) Hepatic artery – carries deoxygenated blood to the gut			
120.	The function of leghemoglobin in the root nodules of legumes is			
	(1) Oxygen removal			
	(2) Inhibition of nitrogenase activity			
	Expression of nif gene			
-	Nodule differentiation			
121.	Synapsis occurs between			
	(1) mRNA and ribosomes			
	(2) male and female gametes			
	(3) Two homologous chromosomes			
	(4) Spindle fibers and centromere			
122.	A nitrogen fixing microbe associated with Azolla in rice fields is			
	(1) Frankia (2) Tolypothrix			
	(3) Spirulina (4) Anabaena			

Question No.	Questions			
123.	A patient brought to a hospital with myocardial infarction is normally immediately given			
	(1) Cyclosporin-A (2) Statins			
	(3) Penicillin (4) Streptokinase			
124.	Rotenone is			
	(1) A bioherbicide (2) A natural insecticide			
	(3) An insect hormone (4) A natural herbicide			
125.	Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as			
	(1) Genetic flow (2) Genetic drift			
	(3) Random mating (4) Genetic load			
126.	GIFT (Gamete intrafallopian transfer) mixes egg and sperm in the			
	(1) Fallopian tube (2) Uterus			
**	(3) Vagina (4) Culture medium			
127.	An example of merocrine gland is			
	(1) Sebaceous gland (2) Pineal gland			
	(3) Salivary gland (4) Mammary gland			

Question No.	Questions			
128.	AT]	Pase enzyme needed for mu	uscle (contraction is located in
	(1)	Actinin	(2)	Troponin
	(3)	Myosin	(4)	Actin
129.	Cas	parian strips are present i	n the	of the root.
	(1)	Pericycle	(2)	Cortex
	(3)	Epiblema	(4)	Endodermis
130.	The	inner, darker and harder duct water, in an older dicc	porti	ion of secondary xylem that cannot n, is called
	(1)	Bast	(2)	Alburnum
	(3)	Duramen	(4)	Wood
			598	
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NOT TO BE OPENED BEFORE TIME OR TILL ASKED TO DO SO)

(BPH-EE-2019)

10159

Code

Sr.	No.	

SET-"Z"

Time: 1¹/₄ Hours (75 minutes) Total Questions: 130 Max. Marks: 100

(Signature of the Invigilator)

(Signature of the candidate)

CANDIDATES MUST READ THE FOLLOWING INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER & FOLLOW THEM.

- 1. All questions under Part-A and Part-B are compulsory. Part-C is optional. The candidates may attempt either Optional Part-C (i) OR Option Part-C(ii). All questions carry equal marks i.e. one mark each.
- 2. The candidate MUST return this question book-let and the OMR Answer-She to the Invigilator concerned before leaving the Examination Hall, failing which a cas of use of unfair-means/misbehaviour will be registered against him/her, in addition lodging of an FIR with the police. Further the answer-sheet of such candidate will no be evaluated.
- 3. The candidate MUST NOT do any rough work OR writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself.
- 4. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 5. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
- 6. Use only Blue or Black <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 7. There will be no negative marking. Each correct answer will be awarded one full mark Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 8. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE QUESTION BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER THE START OF EXAMINATION.



Question No.	Questions			
	Part-A (Physics)			
1.	Ler of	nz's law in electromagnet	ic inc	luction follows law of conservation
	(1)	Charge	(2)	Energy
	(3)	Linear momentum	(4)	Angular momentum
2.	Res	sistance offered by a Capaci	itor to	D.C. is
	(1)	zero	(2)	negative
	(3)	positive	(4)	infinite
3.	Mechanical analogue of inductance is			
	(1)	Displacement	(2)	Velocity
	(3)	Energy	(4)	Mass
4.	The classification of Electromagnetic spectrum is roughly based upon			
- 20	(1)	How the waves are produc	ed	
	(2)	How the waves are detect	ed	
	(3)	Both (1) and (2)		
	(4)	Wavelength of waves		[®] e y
5.	If the will	ne atmosphere of earth su	dden	ly disappears then duration of day
	(1)	Increase by 4 minutes	(2)	Decrease by 4 minutes
	(3)	No change	(4)	Can't be predicted

Question No.	Questions
6.	Two iron spheres, A (a solid sphere) and B (a hollow sphere), are charged to same potential. Which of the two hold more energy?
aletina eta	(1) A (2) B
	(3) Both have same (4) Can't be predicted
7.	Two bulbs A and B of 25 watt and 100 watt, respectively, rated at 220 V, are connected in series with a supply of 440 V. Which bulb will fuse?
	(1) A (2) B
	(3) Both will fuse (4) None will fuse
8.	When a charge particle moves through a magnetic field, it may suffer a change in
	(1) Energy (2) Mass
	(3) Speed (4) Velocity
9.	Two electrons are moving parallel to each other in free space, then the force between them will be
	(1) Attractive (2) Repulsive
	(3) No force (4) Can't say anything
10.	Current used for electrolysis is
	(1) D.C. (2) A.C.
	(3) Both of these (4) None of these

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Question No.			Ques	tions
11.	A sample of oxygen and a sample of hydrogen have same mass, volu and pressure. The ratio of their absolute temperature is			
	(1)	1/16	(2)	1/4
2 1	(3)	4	(4)	16
12.	The	internal energy of a gas	will inc	rease when it
0 2	(1)	Expands adiabatically	(2)	Is compressed adiabatically
	(3)	Expands isothermally	(4)	Is compressed isothermally
13.	If the	ne absolute temperature ntity of heat radiated pe	of a per	fect black body be doubled, then the lincreases by
	(1)	Two times	(2)	Four times
	(3)	Eight times	(4)	Sixteen times
14.	The moti	time period of a particion from mean position. A	ele unde After 2 s,	rgoing S.H.M. is 16 s. It starts its its velocity is 0.4 ms ⁻¹ , the amplitude
	(1)	2.88 m	(2)	1.44 m
	(3)	0.72 m	(4)	0.36 m
15.	The	speed of wave represent	ed by y	$= A \sin (\omega - kx)$ is
3x 12 1	(1)	k/ω	(2)	ω/k
	(3)	ωk	(4)	1/ωk

Question	Questions				
No.	4				
16.	A small insect enters the eye of person riding a bike, the person then applies sudden brakes to his bike without rubbing his eye and he found that the small insect got out of his eye. By which law of physics the small insect got out of eye				
	(1) Newton's third law of motion (2) Newton's second law of motion				
	(3) Newton's first law of motion (4) Newton's law of Gravitation				
17.	Two bodies with masses m_1 and m_2 ($m_1 > m_2$) are joined by a massless string passing over fixed pulley. The centres of gravity of the two masses are initially at same height. Assume the pulley to be weightless. Then the downward acceleration of mass m_1 is				
	(1) $\frac{m_1}{m_1 + m_2} g$ (2) $\frac{m_2}{m_1 + m_2} g$				
	(3) $\frac{m_1 - m_2}{m_1 + m_2} g$ (4) $\left[\frac{m_1 - m_2}{m_1 + m_2} \right]^2 g$				
18.	A block of mass 1 kg lies on a horizontal surface in a truck. The coefficient				
- m 40	of static friction between the block and the surface is 0.6. If the acceleration of truck is 5 ms ⁻² , the frictional force acting on the block is				
1	(1) 4 N (2) 5 N				
2	(3) 6 N (4) 10 N				
19.	Two balls of different mass have same kinetic energy. The ball having greater momentum will be				
	(1) Heavier one (2) Lighter one				
	(3) Both have same (4) Can't say				
20.	The moment of inertia of a ring of mass M and radius R about an axis through the diameter in its plane will be				
	(1) $0.5 \mathrm{MR^2}$ (2) $\mathrm{MR^2}$				
	(3) $1.5 \mathrm{MR^2}$ (4) $2 \mathrm{MR^2}$				

Question No.			Ques	tions
21.	The of the	strength of Weak nu he order of	clear force	relative to Electromagnetic force is
	(1)	10-13	(2)	10-11
	(3)	1013	(4)	1011
22.	Par	sec is unit of		
	(1)	Mass	(2)	Length
	(3)	Time	(4)	Frequency
23.		adius of earth contrac ains same then the ac		f its actual value and mass of earth due to gravity will
	(1)	Decrease by 2%	(2)	Decrease by 4%
	(3)	Increase by 2%	(4)	Increase by 4%
24.	whe		$1s^{-2}$, and t	ong X-axis is given by $x = A + Bt^2$, is measured in seconds. The average s and $t = 3$ s is
	(1)	10 ms ⁻¹	(2)	15 ms ⁻¹
,	(3)	20 ms ⁻¹	(4)	$25~\mathrm{ms^{-1}}$
25.		all is thrown at a speed maximum height atta		a direction 30° above the horizontal. e ball will be
	(1)	25 m	(2)	20 m
	(3)	10 m	(4)	5 m

Question No.				Quest	ons	
26.	The	blue colour o	f sky is due	to		
	(1)	Reflection of	flight	(2)	Refraction of light	
	(3)	Scattering o	f light	(4)	Diffraction of light	
27.	If to rational will	o of intensit	sources of y of maxima	intens a and n	ity ratio 25:1 interfere, then inima in the interference pa	the ttern
6 6 8	(1)	3:2		(2)	9:4	
	(3)	5:1		(4)	25:1	
28.	Nuc	clear force be	tween two n	ucleons	depends on their	
	(1)	Mass		(2)	Charge	
3	(3)	Spin		(4)	Both (2) and (3)	
29.	Cha	arge on a n-ty	ype semicon	ductor is		
	(1)	Zero		(2)	Negative	
	(3)	Positive		(4)	10 ⁻⁶ coulomb	
30.	dis	a zener diode sipation of 2 ner diode is	has 9.1 V l 73 mW, the	oreak do	own voltage with a maximum num current that can pass th	power rough
* * * * * * * * * * * * * * * * * * *	(1)	40 mA		(2)	30 mA	
	(3)	20 mA	Ž. ž.	(4)	10 mA	

Question No.				# E = 10	Ques	tions		
31.							an inclined plane of inclinations the plane is	nation
	(1)	g/4			(2)	g/3	Margarity 1885	
	(3)	g/2	rija roja e se mje e se se se se		(4)	2g/3	leví te yozaza a	
32.	eart	th. If it i	, fired ver s to be fire capes fron	d at 4	5° to the	ds with horizor	a speed v escapes frontal, what should be its	m the speed
	(1)	v			(2)	$v/\sqrt{2}$		
	(3)	$\sqrt{2}$ v	in he iya Tarkii atak		(4)	2v	ris Auto to company (Transportation of the company	
33.	Whi	ich of the	e following	subst	ances ha	as negli	gible elastic fatigue?	120
	(1)	glass	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		(2)	coppe		478
ě	(3)	quartz			(4)	silver		*
34.	The	modulu	s of rigidit	y of w	ater is			2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -
	(1)	zero			(2)	1		
	(3)	81			(4)	infinit	e	
35.	The	surface	tension de	oes no	t depend	lupon		
	(1)	Nature	of liquid		(2)	Tempe	erature	
= e ³	(3)	Presen	ce of impu	rity	(4)	Atmos	pheric Pressure	

Question No.	Questions			
	Part-B	(Chemistry)		
36.	Electrolytic reduction of nitro	obenzene in weakly acidic medium gives :		
	(1) Aniline	(2) Nitosobenzene		
	(3) N-phenylhydroxylamine	(4) p-hydroxyaniline		
37.	The efficiency of fuel cell is g	iven by		
	$(1) \frac{\Delta G}{\Delta S}$	(2) $\frac{\Delta G}{\Delta H}$		
	(3) $\frac{\Delta S}{\Delta G}$	$(4) \frac{\Delta H}{\Delta G}$		
38.	Thymine is:			
	(1) 5-methyluracil	(2) 4-methyluracil		
	(3) 3-methyluracil	(4) 1-methyluracil		
39.	If the rate of the reaction is reaction is	equal to the rate constant, the order of the		
	(1) 0	(2) 1		
	(3) 2	(4) 3		
40.	Which of the following poly monomer unit?	mer can be formed by using the following		
	H ₂ C	v_c=0		
	H ₂ C-	CH ₂ -CH ₂		
	(1) Nylon 6, 6	(2) Nylon 2-nylon 6		
	(3) Melamine polymer	(4) Nylon-6		

Question No.	Questions				
41.	The reaction of				
	CH ₃ -CH=CH—OH with HBr gives :				
	(1) $CH_3CHBrCH_2$ —OH				
	(2) CH ₃ CH ₂ CHBr—OH				
	(3) $CH_3CHBrCH_2$ —Br				
	(4) CH_3CH_2CHBr —Br				
42.	Among the following the one that gives positive Idoform test upon reaction with ${\rm I_2}$ and NaOH is :				
	(1) $CH_3CH_2CH(OH)CH_2CH_3$ (2) $C_6H_5CH_2CH_2OH$				
	(3) $CH_3 \longrightarrow CH_3$ (4) $PhCHOHCH_3$				
43.	In the following sequence of reaction, identify the final product:				
	$CH_3\text{-Mg-Br} + \bigcup_{O} \xrightarrow{H_3O^+} A \xrightarrow{HBr} B \xrightarrow{Mg.ether} C \xrightarrow{CH_3CHO} D$				
	(1) CH ₃ CHOH CH ₃ C=O CH ₃ CH ₃				
	(3) CHOH-CH ₃ (4) CH ₂ OH				

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Question No.	Questions
44.	The correct order of increasing acidic strength is -
· w	(1) Phenol < Ethanol < Chloroacetic acid < Acetic acid
	(2) Ethanol < Phenol < Chloroacetic acid < Acetic acid
	(3) Ethanol < Phenol < Acetic acid < Chloroacetic acid
5	(4) Chloroacetic acid < Acetic acid < Phenol < Ethanol
45.	Among the following which one does not act as an intermediate in Hofmann rearrangement?
, ¥ 1.	(1) RNCO (2) RCON:
	(3) RCON:HBr (4) RNC
46.	Which alkene on ozonolysis gives $\mathrm{CH_3CH_2CHO}$ and $\mathrm{CH_3COCH_3}$?
	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
	(3) $CH_3CH_2CH=CHCH_3$ (4) $CH_3C(CH_3)=CHCH_3$
47.	$NBS \rightarrow A \xrightarrow{NaC \equiv CH} B$, what are A and B:
	(1) H $C \equiv CH$ $C \equiv C-Na$
	(3) $C \equiv CH$ (4) None of them

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Question No.	Questions
48.	Identify the compound Y in the following reaction:
	$ \begin{array}{c c} & NaNO_2 + HC\ell \\ \hline & 273-278 \text{ K} \end{array} $ $ \begin{array}{c c} & Cu_2C\ell_2 \\ \hline & Y + N_2 \end{array} $
	$(1) \bigcirc^{\mathrm{C}\ell} \qquad \qquad (2) \bigcirc$
20 20 21	$(3) \qquad \qquad (4) \qquad \overset{C\ell}{\bigodot}$
	Ĉℓ
49.	Which reagent will you use for the following reaction?
ţ.	$\mathrm{CH_{3}CH_{2}CH_{2}CH_{3}} \rightarrow \mathrm{CH_{3}CH_{2}CH_{2}CH_{2}C\ell} + \mathrm{CH_{3}CH_{2}CHC\ellCH_{3}}$
A 200	(1) $C\ell_2/UV $ light (2) $NaC\ell + H_2SO_4$
	(3) $C\ell_2$ gas in dark (4) $C\ell_2$ gas in the presence of iron in dark
50.	In the following sequence of reaction:
o mose Postupi Po	$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$ The compound D is:
	(1) Butanal (2) n- butyl alcohol
	(3) n- propyl alcohol (4) Propanal

Question No.	Questions				
51.	The term that accounts for intramolecular force in van der Waal's equation for non-ideal gas is				
V	(1) RT (2) V-b				
e e	(3) $P + \frac{a}{V^2}$ (4) $(RT)^{-1}$				
52.	Which one of the following is not applicable to the phenomena of absorption				
	(1) $\Delta H > 0$ (2) $\Delta G < 0$				
	(3) $\Delta S < 0$ (4) $\Delta H < 0$				
53.	Which one of the following is a positively charged sol				
	(1) Gold sol (2) As_2S_3 sol				
	(3) Methylene blue sol (4) Gelatin				
54.	What is the normality of 1 M H ₃ PO ₂ solution?				
	(1) 0.5 N (2) 1.0 N				
	(3) 2.0 N (4) 3.0 N				
55.	A cricket ball 0.5 Kg is moving with a velocity of 100 ms ⁻¹ . The wavelength associated with its motion is:				
	(1) $1/100 \text{ cm}$ (2) $6.6 \times 10^{-34} \text{ m}$				
	(3) $1.32 \times 10^{-35} \mathrm{m}$ (4) $6.6 \times 10^{-28} \mathrm{m}$				

Question No.	Questions			
56.	25 mL of a solution of Ba(OH) ₂ on titration with 0.1 M solution of HCe gave a titre value of 35 mL. The molarity of barium hydroxide solution was			
	(1) 0.07 (2) 0.14			
	(3) 0.28 (4) 0.35			
57.	Identify the least stable among the following:			
	(1) Li ⁻ (2) Be ⁻			
	(3) B ⁻ (4) C ⁻			
58.	The correct order of size among $C\ell$, $C\ell^+$ and $C\ell^-$ is			
	(1) $C\ell^+ < C\ell^- < C\ell$ (2) $C\ell^+ > C\ell^- > C\ell$			
	(3) $C\ell^+ < C\ell < C\ell^-$ (4) $C\ell^- < C\ell < C\ell^+$			
59.	The geometry of $C\ell O_4^-$ ion is:			
	(1) Pyramidal (2) Tetrahedral			
	(3) Trigonal Planar (4) Trigonal bipyramidal			
60.	The number of orbitals in a subshell is equal to			
	(1) $2\ell - 1$ (2) 2ℓ			
	(3) ℓ^2 (4) $2\ell+1$			

Question No.	Questions				
61.	Which of the following is not a target molecule for drug function in body?				
\vee	(1) Carbohydrates (2) Lipids				
	(3) Vitamins (4) Proteins				
62.	The pollutants released by jet aeroplane in the atmosphere as fluorocarbons are called				
	(1) Photochemical oxidants				
	(2) Photochemical reductants				
	(3) Aerosols				
	(4) Physical pollutants				
63.	Which of the following pairs has the same size?				
	(1) Zn^{2+} , Hf^{4+} (2) Fe^{2+} , Ni^{2+}				
	(3) Zr^{4+} , Ti^{4+} (4) Zr^{4+} , Hf^{4+}				
64.	The coordination number and oxidation state number of Cr in K ₃ Cr(C ₂ O ₄) ₃ are respectively				
	(1) 3 and +3 (2) 3 and 0				
	(3) 6 and +3 (4) 4 and +2				
65.	Ionic solids, with Schottky defects, contain in their structure				
	(1) Cation vacancies only				
	(2) Cation vacancies and interstitial cations				
	(3) Equal number of cation and anion vacancies				
	(4) Anion vacancies and interstitial anions				

Question No.		· · · · · · · · · · · · · · · · · · ·	Ques	tions
66.	Ort	ho and para hydrogen differ	in	en region of the control of the cont
	(1)	atomic number		(2) mass number
	(3)	electron spin in two atoms		(4) nuclear spin in two atoms
67.	Wh	ich of the following carbonat	es is	least stable
_e e st	(1)	MgCO_3	(2)	Na_2CO_3
	(3)	K_2CO_3	(4)	$\mathrm{Rb_2CO_3}$
68.	The	IUPAC name of the		
		Me Me Me Me		
	Stru	acture is :		
	(1)	2,4,5-triethyl-3-nonene	(2)	5,6-diethyl-3-methyl-4-decene
	(3)	2,4,6-triethyl-3-octene	(4)	3-ethyl-5-methyl-3-heptene
69.	The	strongest base among the fo	llow	ing is:
	(1)		(2)	H H
e e grando por m	(3)	N H	(4)	NH ₂
70.	The number of σ -and Π -bonds present in pent-4-ene-1-yne is :			
	(1)	10, 3	(2)	4, 9
	(3)	3, 10	(4)	9, 4

Question No.	Questions				
	Part-C {Opt. (i)} (Mathematics)				
71.	The largest value of a third order determinant whose elements are 0 or 1 is:				
\checkmark	(1) 3 (2) 2				
	(3) 1 (4) 0				
72.	The set of all points, where the function $f(x) = \frac{x}{1+ x }$ is differentiable				
	is:				
	(1) $(0, \infty)$ (2) $(-\infty, \infty)$ (3) $(-\infty, 0) \cup (0, \infty)$ (4) None of these				
	(3) $(-\infty, 0) \cup (0, \infty)$ (4) None of these				
73.	The function f (x) is defined by				
	$f(x) = \begin{cases} \frac{ x+2 }{\tan^{-1}(x+2)}, & x \neq -2 \\ 2, & x = -2 \end{cases}, \text{ then}$				
. ,	f (x) is:				
	(1) continuous at $x = -2$				
	(2) differentiable at $x = -2$				
	(3) not continuous at $x = -2$				
	(4) continuous but not derivable at $x = -2$				
74.	If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A \cos 4x + B$, then				
4	(1) $A = -\frac{1}{8}$ (2) $A = -\frac{1}{4}$ (3) $A = -\frac{1}{2}$ (4) -1				
	(3) $A = -\frac{1}{2}$ (4) -1				

Question No.	Questions		
75.	The area of the figure bounded by $y = \sin x$, $y = \cos x$ in the first quadrant is:		
	(1) $2(\sqrt{2}-1)$ (2) $\sqrt{3}+1$		
	(3) $2(\sqrt{3}-1)$ (4) None of these		
76.	The one which is the measure of central tendency is:		
	(1) co-efficient of correlation (2) standard deviation		
	(3) mean deviation (4) mode		
77.	If S be a finite set containing n elements. The the total number of binary operations on S is:		
,	(1) n^n (2) 2^{n^2}		
	(3) n^2 (4) n^{n^2}		
78.	The solution of the equation $\tan^{-1}(1+x) + \tan^{-1}(1-x) = \frac{\pi}{2}$ is:		
	(1) $x = 1$ (2) $x = -1$		
	(3) $x = 0$ (4) $x = \pi$		
79.	If $A = [a \ b]$, $B = [-b \ -a]$ and $C = \begin{bmatrix} a \\ -a \end{bmatrix}$, then the correct statement		
	is:		
	(1) $A = -B$ (2) $A + B = A - B$		
	(1) $A = -B$ (2) $A + B = A - B$ (3) $AC = BC$ (4) $CA = CB$		

Question No.	Questions					
80.	The value of λ and μ for which the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$ and $x + 2y + \lambda z = \mu$ have unique solution are:					
	(1) $\lambda \neq 3, \mu \in \mathbb{R}$ (2) $\lambda = 3, \mu = 10$					
	(3) $\lambda \neq 3, \ \mu = 10$ (4) $\lambda \neq 3, \ \mu \neq 10$					
81.	Area of the triangle formed by 3 complex numbers $1 + i$, $i - 1$, Argand plane is	Area of the triangle formed by 3 complex numbers $1+i,i-1,2i$ in the Argand plane is				
\sim	(1) $\frac{1}{2}$ (2) 1					
n ag en a	(3) $\sqrt{2}$ (4) 2					
82.	If the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have of common, then the value of k is:	If the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common, then the value of k is:				
	(1) 3 (2) -3					
	(3) 4 (4) None of these					
83.	The solution of the equation $1 + x-1 \ge 0$ is:					
	(1) $(-\infty, 0)$ (2) $(-2, 0)$					
	(3) $(0, \infty)$ (4) $(0, 2)$					
84.	12 persons are to be arranged to a round table. If two particular persons among them are not to be side by side, the total number of arrangements is:					
	(1) 9 (10!) (2) 2 (10!)					
	(3) 2 (11!) (4) 10!					
85.	The positive integer just greater than $(1 + 0.0001)^{10000}$ is					
	(1) 3 (2) 4					
	(3) 5 (4) None of these					

Questions		
If A and B are any two sets, then $A - B \neq$	* 12	
$(1) B \cap A' \qquad \qquad (2) A \cap B'$		
(3) $(A' \cup B)'$ (4) None of these		
Let R be the relation of the set R of all real numbers defined $ a-b \le 1$. Then R is	d by aRb iff	
(1) reflexive and symmetric (2) symmetric only		
(3) transitive only (4) anti-symmetric only		
If $f(x) = \frac{x-1}{x+1}$, then $f\left(\frac{1}{f(x)}\right)$ equals:	gas a o sa successivo	
(1) 0 (2) 1		
(3) x (4) $\frac{1}{x}$		
Which of the following is correct?		
(1) $\sin 1^{\circ} > \sin 1$ (2) $\sin 1^{\circ} < \sin 1$		
(3) $\sin 1^{\circ} = \sin 1$ (4) $\sin 1^{\circ} = \frac{\pi}{180} \sin 1$.		
The cube roots of unity lie on a circle		
(1) $ z-1 =1$ (2) $ z+1 =1$		
(3) $ z = 1$ (4) None of these		
	If A and B are any two sets, then $A - B \neq$ (1) $B \cap A'$ (2) $A \cap B'$ (3) $(A' \cup B)'$ (4) None of these Let R be the relation of the set R of all real numbers defined $ a-b \leq 1$. Then R is (1) reflexive and symmetric (2) symmetric only (3) transitive only (4) anti-symmetric only If $f(x) = \frac{x-1}{x+1}$, then $f\left(\frac{1}{f(x)}\right)$ equals: (1) 0 (2) 1 (3) x (4) $\frac{1}{x}$ Which of the following is correct? (1) $\sin 1^\circ > \sin 1$ (2) $\sin 1^\circ < \sin 1$ (3) $\sin 1^\circ = \sin 1$ (4) $\sin 1^\circ = \frac{\pi}{180} \sin 1$. The cube roots of unity lie on a circle (1) $ z-1 = 1$ (2) $ z+1 = 1$	

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Question No.	Questions			
91.	The order of the differential equation whose solution is			
	$y = a \cos x + b \sin x + c e^{-x}$ is			
e	(1) 2 (2) 1			
	(3) 3 (4) None of these			
92.	If $\vec{r} = x \hat{i} + y \hat{j} + z \hat{k}$, then value of $(\vec{r} \cdot \hat{i}) \hat{i} + (\vec{r} \cdot \hat{j}) \hat{j} + (\vec{r} \cdot \hat{k}) \hat{k}$ is			
	(1) 0 (2) $3\vec{r}$			
	(3) 8 r (4) r			
93.	The vectors $2\hat{i}+3\hat{j}-4\hat{k}$ and $a\hat{i}+b\hat{j}+c\hat{k}$ are perpendicular when:			
	(1) $a = 2, b = 3, c = 4$ (2) $a = 4, b = 4, c = -2$			
*	(3) $a = 5, b = 4, c = 4$ (4) $a = 4, b = 4, c = 5$			
94.	A fair coin is tossed 100 times. The probability of getting tails an odd number of times is:			
	(1) $\frac{3}{8}$ (2) $\frac{1}{2}$			
	(3) $\frac{1}{8}$ (4) None of these			
95.	The equation $ \vec{r} ^2 - 2(\vec{r} \cdot \vec{a}) + \lambda = 0$ represents a			
	(1) plane (2) straight line			
	(3) sphere (4) none of these			
- 20				

Question No.	Questions				
96.	If H be the HM between a and b, then the value of $\frac{H}{a} + \frac{H}{b}$ is				
	$(1) \frac{ab}{a+b} \qquad \qquad (2) \frac{a+b}{ab}$				
	(3) 2 (4) None of these				
97.	The straight lines $x + y = 0$, $3x + y - 4 = 0$, $x + 3y - 4 = 0$ form a triangle which is:				
	(1) right angled (2) equilateral				
	(3) isosceles (4) none of these				
98.	The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis is of length:				
	(1) 3 (2) 4				
	(3) 7 (4) 1				
99.	The value of $\lim_{x \to \infty} \left(\frac{x+3}{x-1} \right)^{x+3}$ is				
	(1) e (2) e^2				
	(3) e^3 (4) e^4				
100.	If there are 6 girls and 5 boys who sit in a row, then the probability that no two boys sit together is:				
	(1) $\frac{6! \ 7!}{2! \ 11!}$ (2) $\frac{5! \ 7!}{2! \ 11!}$				
- 4	(3) $\frac{6! 6!}{2! 11!}$ (4) None of these				

Question No.	Questions					
	Part-C {Opt. (ii)} (Biology)					
101.	Seed coat is not thin, membranous in					
✓	(1) Groundnut (2) Coconut					
	(3) Maize (4) Gram					
102.	Lenticels are involved in					
	(1) Transportation (2) Gaseous exchange					
	(3) Food transport (4) Photosynthesis					
103.	Insect mouthparts are adapted for different functions in different species. Mouthparts of houseflies are used for					
	(1) Siphoning					
	(2) Piercing and sucking					
	(3) Sponging and lapping					
	(4) Biting and chewing					
104.	The first enzyme to be purified and crystalized was					
	(1) Urease (2) Diastase					
	(3) Insulin (4) Zymase					
105.	Many enzymes are secreted in inactive form to protect					
	(1) Cell membrane (2) Mitochondria					
	(3) Cell proteins (4) Cell DNA					

Question No.	Questions				
106.	GIFT (Gamete intrafallopian transfer) mixes egg and sperm in the				
	(1)	Fallopian tube	(2)	Uterus	
	(3)	Vagina	(4)	Culture medium	
107.	An	example of merocrine gland	is_		
	(1)	Sebaceous gland	(2)	Pineal gland	
	(3)	Salivary gland	(4)	Mammary gland	
108.	ATI	Pase enzyme needed for mu	scle	contraction is located in	
	(1)	Actinin	(2)	Troponin	
	(3)	Myosin	(4)	Actin	
109.	Cas	parian strips are present ir	the	of the root.	
	(1)	Pericycle	(2)	Cortex	
	(3)	Epiblema	(4)	Endodermis	
110.	The inner, darker and harder portion of secondary xylem that cannot conduct water, in an older dicot stem, is called				
8*2	(1)	Bast	(2)	Alburnum	
	(3)	Duramen	(4)	Wood	
	ks.				

Question No.	Questions					
111.	Synapsis occurs between					
	(1) mRNA and ribosomes					
	(2) male and female gametes					
	(3) Two homologous chromosomes					
	(4) Spindle fibers and centromere					
112.	A nitrogen fixing microbe associated with $Azolla$ in rice fields is					
	(1) Frankia (2) Tolypothrix					
	(3) Spirulina (4) Anabaena					
113.	A patient brought to a hospital with myocardial infarction is normally immediately given					
R	(1) Cyclosporin-A (2) Statins					
	(3) Penicillin (4) Streptokinase					
114.	Rotenone is					
	(1) A bioherbicide (2) A natural insecticide					
	(3) An insect hormone (4) A natural herbicide					
115.	Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as					
	(1) Genetic flow (2) Genetic drift					
	(3) Random mating (4) Genetic load					

Question No.	Questions				
116.	Genetic engineering is connected with				
	(1)	Eugenics	(2)	Euthenics	
	(3)	Euphenics	(4)	All of these	
117.	Son	ne people who have suffere ing their life time ; such im	d fron ımuni	n a disease may not be affected again ty is called	
	(1)	Natural immunity	(2)	Acquired immunity	
	(3)	Innate immunity	(4)	Passive immunity	
118.	Rav	v cheese is known as			
	(1)	Blue cheese	(2)	Cottage cheese	
	(3)	Swiss cheese	(4)	None of these	
119.	Cell	division cannot be stopped	l in w	hich phase of the cell cycle?	
-	(1)	G ₁ -Phase	(2)	G ₂ -Phase	
	(3)	S-Phase	(4)	Prophase	
120.	What type of plant is formed when colchicine is used in the process of development of Raphanobrassica?				
	(1)	Autotetraploid	(2)	Haploid	
	(3)	Triploid	(4)	Allotetraploid	

Question No.	Questions					
121.	An action potential in the nerve fiber is produced when positive and negative charges on outside and the inside of the axon membrane are reversed because					
\sim	(1) All potassium ions leave the axon					
	(2) More potassium ions enter the axon as compared to sodium ions leaving it					
	(3) More sodium ions enter the axon as compared to potassium ions leaving it					
	(4) All soidum ions enter the axon					
122.	Sequence of taxonomic categories is					
	(1) Divison - Class - Order - Family - Tribe - Genus - Species					
	(2) Class - Phylum - Tribe - Order - Family - Genus - Species					
	(3) Phylum - Order - Class - Tribe - Family - Genus - Species					
	(4) Division - Class - Family - Tribe - Order - Genus - Species					
123.	In the five-kingdom system of classification, which single kingdom out of the following can include blue green algae, nitrogen-fixing bacteria and methanogenic archaebacteria?					
	(1) Protista (2) Fungi					
	(3) Monera (4) Plantae					
124.	Methanogens are					
	(1) Obligate anaerobic bacteria					
	(2) Aerobic fungi					
	(3) Aerobic bacteria					
	(4) Obligate anaerobic fungi					

Question No.	Questions				
125.	Noise is measured using sound meter and the unit is				
	(1) Hertz				
	(2) Decibel				
	(3) Joule				
	(4) Sound				
126.	The tendency of population to remain in genetic equilibrium may be disturbed by				
	(1) Random mating (2) Lack of migration				
	(3) Lack of mutation (4) Lack of random mating				
127.	If two pea plants having red (Dominant) colored flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red colored flowers will be				
	(1) Both heterozygous				
	(2) One homozygous and other heterozygous				
	(3) Both homozygous				
	(4) Both hemizygous				
128.	The deposition of lipids on the wall lining the lumen of large and medium sized arteries is referred to as				
	(1) Osteoarthritis (2) Osteoporosis				
	(3) Stokes-Adams Syndrome (4) Atherosclerosis				

uestion No.	Questions					
129.	Which of the following matches correctly?					
	(1) Pulmonary artery - Carries deoxygenated blood to the lungs					
	(2) Superior vena cava – Receives deoxygenated blood from the lower body and organs					
	(3) Inferior vena cava – Receives deoxygenated blood from the head and body					
	(4) Hepatic artery – carries deoxygenated blood to the gut					
130.	The function of leghemoglobin in the root nodules of legumes is					
	(1) Oxygen removal					
	(2) Inhibition of nitrogenase activity					
	(3) Expression of nif gene					
	(4) Nodule differentiation					
-						
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May 7/19

(NOT TO BE OPENED BEFORE TIME OR TILL ASKED TO DO SO) (BPH-EE-2019)

Code D

sr. No.10160

Code Time: 1 ¹ / ₄ Hours (75 minutes) Total Que	estions • 120	SET-"Z"
Candidate's Name :		Max. Marks: 100
Father's Name :		
Roll No (in figure)	II Y	(in words
Date of Examination:		
(Signature of the Invigilator)	(Signatu	are of the candidate

CANDIDATES MUST READ THE FOLLOWING INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER & FOLLOW THEM.

1. All questions under Part-A and Part-B are compulsory. Part-C is optional The candidates may attempt either Optional Part-C (i) OR Optional Part-C (ii). All questions carry equal marks i.e. one mark each.

2. The candidate MUST return this question book-let and the OMR Answer-She to the Invigilator concerned before leaving the Examination Hall, failing which a car of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.

- 3. The candidate MUST NOT do any rough work OR writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself.
- 4. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 5. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
- 6. Use only Blue or Black $\underline{BALL\ POINT\ PEN}$ of good quality in the OMR Answer-Sheet.
- 7. There will be no negative marking. Each correct answer will be awarded one full mark Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 8. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE QUESTION BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER THE START OF EXAMINATION.

Question No.	Questions					
		Part-A (Physics)				
1.	Two	o iron spheres, A (a solid sphame potential. Which of the	e two	and B (a hollow sphere), are charged hold more energy?		
	(1)	A	(2)	В		
	(3)	Both have same	(4)	Can't be predicted		
2.	Two	bulbs A and B of 25 watt a connected in series with a s	nd 10 uppl	00 watt, respectively, rated at 220 V, y of 440 V. Which bulb will fuse?		
	(1)	\mathbf{A}	(2)	В		
	(3)	Both will fuse	(4)	None will fuse		
3.	When a charge particle moves through a magnetic field, it may suffer a change in					
	(1)	Energy	(2)	Mass		
	(3)	Speed	(4)	Velocity		
4.	Two electrons are moving parallel to each other in free space, then the force between them will be					
	(1)	Attractive	(2)	Repulsive		
	(3)	No force	(4)	Can't say anything		
5.	Cur	rent used for electrolysis is				
	(1)	D.C.	(2)	A.C.		
	(3)	Both of these	(4)	None of these		

Question No.	Questions					
6.	A sa and	A sample of oxygen and a sample of hydrogen have same mass, volume and pressure. The ratio of their absolute temperature is				
	(1)	1/16	(2)	1/4		
	(3)	4	(4)	16		
7.	The	internal energy of a gas w	ill incr	ease when it		
,	(1)	Expands adiabatically	(2)	Is compressed adiabatically		
	(3)	Expands isothermally	(4)	Is compressed isothermally		
8.	If th	ne absolute temperature or ntity of heat radiated per	f a per second	fect black body be doubled, then the increases by		
	(1)	Two times	(2)	Four times		
	(3)	Eight times	(4)	Sixteen times		
9.	The motis	e time period of a particle tion from mean position. Af	e unde ter 2 s,	ergoing S.H.M. is 16 s. It starts its its velocity is $0.4 \mathrm{ms^{-1}}$, the amplitude		
	(1)	2.88 m	(2)	1.44 m		
	(3)	0.72 m	(4)	0.36 m		
10.	The speed of wave represented by $y = A \sin(\omega - kx)$ is					
	(1)	k/ω	(2)	ω/k		
	(3)	ωk	(4)	1/ωk		

Question No.	Questions				
11.	A small insect enters the eye of person riding a bike, the person then applies sudden brakes to his bike without rubbing his eye and he found that the small insect got out of his eye. By which law of physics the small insect got out of eye				
	(1) Newton's third law of motion (2) Newton's second law of motion	n			
	(3) Newton's first law of motion (4) Newton's law of Gravitation				
12.	Two bodies with masses m_1 and m_2 ($m_1 > m_2$) are joined by a massle string passing over fixed pulley. The centres of gravity of the two mass are initially at same height. Assume the pulley to be weightless. Then the downward acceleration of mass m_1 is	es			
	(1) $\frac{m_1}{m_1 + m_2} g$ (2) $\frac{m_2}{m_1 + m_2} g$				
	(3) $\frac{m_1 - m_2}{m_1 + m_2} g$ (4) $\left[\frac{m_1 - m_2}{m_1 + m_2}\right]^2 g$				
13.	A block of mass 1 kg lies on a horizontal surface in a truck. The coefficient of static friction between the block and the surface is 0.6. If the acceleration of truck is 5 ms ⁻² , the frictional force acting on the block is				
	(1) 4 N (2) 5 N	.			
8	(3) 6 N (4) 10 N				
14.	Two balls of different mass have same kinetic energy. The ball having greater momentum will be	ng			
	(1) Heavier one (2) Lighter one				
	(3) Both have same (4) Can't say	ž.			
15.	The moment of inertia of a ring of mass M and radius R about an arthrough the diameter in its plane will be	cis			
	(1) $0.5 \mathrm{MR^2}$ (2) $\mathrm{MR^2}$				
	(3) $1.5 \mathrm{MR^2}$ (4) $2 \mathrm{MR^2}$	-			

Question No.	Questions				
16.	The blue colour of sky is due to				
	(1) Reflection of light (2) Refraction of light				
	(3) Scattering of light (4) Diffraction of light				
17.	If two coherent sources of intensity ratio 25:1 interfere, then the ratio of intensity of maxima and minima in the interference pattern will be				
a er	(1) 3:2 (2) 9:4				
	(3) 5:1 (4) 25:1				
18.	Nuclear force between two nucleons depends on their				
	(1) Mass (2) Charge				
	(3) Spin (4) Both (2) and (3)				
19.	Charge on a n-type semiconductor is				
	(1) Zero (2) Negative				
	(3) Positive (4) 10^{-6} coulomb				
20.	If a zener diode has 9.1 V break down voltage with a maximum power dissipation of 273 mW, then maximum current that can pass through zener diode is				
	(1) 40 mA (2) 30 mA				
	(3) 20 mA (4) 10 mA				

Code-D

Question No.	Questions					
21.	Lenz's law in electromagnetic induction follows law of conservation of					
. 5	(1) Charge (2) Energy					
	(3) Linear momentum (4) Angular momentum					
22.	Resistance offered by a Capacitor to D.C. is					
	(1) zero (2) negative					
	(3) positive (4) infinite					
23.	Mechanical analogue of inductance is					
	(1) Displacement (2) Velocity					
	(3) Energy (4) Mass					
24.	The classification of Electromagnetic spectrum is roughly based upon					
	(1) How the waves are produced					
	(2) How the waves are detected					
	(3) Both (1) and (2)					
	(4) Wavelength of waves					
25.	If the atmosphere of earth suddenly disappears then duration of day will					
	(1) Increase by 4 minutes (2) Decrease by 4 minutes					
	(3) No change (4) Can't be predicted					

Question No.	Questions				
26.	A thin uniform circular discuss rolling down an inclined plane of inclination 30° without slipping. Its linear acceleration along the plane is				
	(1) g/4 (2) g/3				
	(3) g/2 (4) 2g/3				
27.	A projectile, fired vertically upwards with a speed v escapes from the earth. If it is to be fired at 45° to the horizontal, what should be its speed so that it escapes from the earth?				
	(1) v (2) $v/\sqrt{2}$				
	(3) $\sqrt{2} v$ (4) $2v$				
28.	Which of the following substances has negligible elastic fatigue?				
	(1) glass (2) copper				
	(3) quartz (4) silver				
29.	The modulus of rigidity of water is				
	(1) zero (2) 1				
,	(3) 81 (4) infinite				
30.	The surface tension does not depend upon				
	(1) Nature of liquid (2) Temperature				
	(3) Presence of impurity (4) Atmospheric Pressure				

uestion No.	Questions				
31.	The strength of Weak nuclear force relative to Electromagnetic force is of the order of				
	(1)	10-13		(2)	10-11
	(3)	1013		(4)	1011
32.	Par	sec is unit of			
	(1)	Mass		(2)	Length
	(3)	Time		(4)	Frequency
33.	If radius of earth contracts by 2% of its actual value and mass of earth remains same then the acceleration due to gravity will				
	(1)	Decrease by 2	2% *	(2)	Decrease by 4%
	(3)	Increase by 2	%	(4)	Increase by 4%
34.	wh	ere A = 10 m, E	3 = 2.5 m	s^{-2} , and t	long X-axis is given by $x = A + Bt$ is measured in seconds. The average and $t = 3$ s is
	(1)	$10~\mathrm{ms^{-1}}$		(2)	15 ms^{-1}
	(3)	$20~\mathrm{ms^{-1}}$		(4)	$25~\mathrm{ms^{-1}}$
35.	A l	oall is thrown a e maximum he	t a speed ight atta	28 ms ⁻¹ i ined by th	n a direction 30° above the horizont ne ball will be
	(1)	25 m		(2)	20 m
	(3)) 10 m		(4)	5 m

Question No.	Questions				
	Part-B (Chemistry)				
36.	The reaction of				
	CH ₃ -CH=CH—OH with HBr gives:				
	(1) $CH_3CHBrCH_2$ —OH				
	(2) CH ₃ CH ₂ CHBr—OH				
	(3) $CH_3CHBrCH_2$ —Br				
	(4) CH ₃ CH ₂ CHBr—Br				
37.	Among the following the one that gives positive Idoform test upon reaction				
	with I ₂ and NaOH is: (1) CH ₃ CH ₂ CH(OH)CH ₂ CH ₃ (2) C ₆ H ₅ CH ₂ CH ₂ OH				
	CH,				
	(3) CH ₃ —(4) PhCHOHCH ₃				
38.	In the following sequence of reaction, identify the final product:				
	$CH_3\text{-Mg-Br} + \bigcup_{O} \xrightarrow{H_3O^+} A \xrightarrow{HBr} B \xrightarrow{Mg.ether} C \xrightarrow{CH_3CHO} D$				
	(1) CH ₃ CHOH CH ₃ C=O CH ₃ C=O				
	(3) CH ₃ (4) CH ₂ OH CH ₃				

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Question No.	Questions				
39.	The correct order of increasing acidic strength is -				
	(1) Phenol < Ethanol < Chloroacetic acid < Acetic acid				
	(2) Ethanol < Phenol < Chloroacetic acid < Acetic acid				
97	(3) Ethanol < Phenol < Acetic acid < Chloroacetic acid				
	(4) Chloroacetic acid < Acetic acid < Phenol < Ethanol				
40.	Among the following which one does not act as an intermediate in Hofmann rearrangement?				
	(1) RNCO (2) RCON:				
	(3) RCON:HBr (4) RNC				
41.	Which alkene on ozonolysis gives $\mathrm{CH_3CH_2CHO}$ and $\mathrm{CH_3COCH_3}$?				
	(1) $CH_3CH_2CH=C(CH_3)_2$ (2) $CH_3CH_2CH=CHCH_2CH_3$				
	(3) $CH_3CH_2CH=CHCH_3$ (4) $CH_3C(CH_3)=CHCH_3$				
42.	$NBS \rightarrow A \xrightarrow{NaC \equiv CH} B$, what are A and B:				
	(1) $C \equiv CH$ $C \equiv C-Na$ $C \equiv C-Na$				
	(3) $C \equiv CH$ (4) None of them				

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Question No.	Questions
43.	Identify the compound Y in the following reaction:
	$ \begin{array}{c c} & NH_2 & NaNO_2 + HC\ell \\ \hline & 273-278 \text{ K} \end{array} $ $ \begin{array}{c c} & N_2^+C\ell^- \\ \hline & Cu_2C\ell_2 \\ \hline & Y + N_2 \end{array} $
	(1) Cl (2)
	$(3) \qquad \begin{array}{c} C\ell \\ C\ell \end{array}$
44.	Which reagent will you use for the following reaction?
	$\mathrm{CH_3CH_2CH_2CH_3} \rightarrow \mathrm{CH_3CH_2CH_2CH_2CH_2CH_2CH_3}$
	(1) $C\ell_2$ / UV light (2) $NaC\ell + H_2SO_4$
	(3) $C\ell_2$ gas in dark (4) $C\ell_2$ gas in the presence of iron in dark
45.	In the following sequence of reaction:
	$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$
	The compound D is:
	(1) Butanal (2) n- butyl alcohol
	(3) n- propyl alcohol (4) Propanal

Question No.	Questions			
46.	The term that accounts for intramolecular force in van der Waal's equation for non-ideal gas is			
	(1) RT (2) V-b			
	(3) $P + \frac{a}{V^2}$ (4) $(RT)^{-1}$			
47.	Which one of the following is not applicable to the phenomena of absorption			
	(1) $\Delta H > 0$ (2) $\Delta G < 0$			
	(3) $\Delta S < 0$ (4) $\Delta H < 0$			
48.	Which one of the following is a positively charged sol			
-	(1) Gold sol (2) As_2S_3 sol			
	(3) Methylene blue sol (4) Gelatin			
49.	What is the normality of 1 M H_3PO_2 solution?			
	(1) 0.5 N (2) 1.0 N			
	(3) 2.0 N (4) 3.0 N			
50.	A cricket ball 0.5 Kg is moving with a velocity of 100 ms ⁻¹ . The wavelength associated with its motion is :			
	(1) $1/100 \text{ cm}$ (2) $6.6 \times 10^{-34} \text{ m}$			
	(3) $1.32 \times 10^{-35} \mathrm{m}$ (4) $6.6 \times 10^{-28} \mathrm{m}$			

Question No.	Questions				
51.		Which of the following is not a target molecule for drug function in body?			
	(1)	Carbohydrates	(2)	Lipids	
	(3)	Vitamins	(4)	Proteins	
52.	The pollutants released by jet aeroplane in the atmosphere as fluorocarbor are called		ne in the atmosphere as fluorocarbons		
	(1)	Photochemical oxidants		8	
	(2)	Photochemical reductant	ts		
	(3)	Aerosols		*	
	(4)	Physical pollutants			
53.	Wh	ich of the following pairs l	has the	same size?	
	(1)	Zn ²⁺ , Hf ⁴⁺	(2)	Fe ²⁺ , Ni ²⁺	
	(3)	Zr ⁴⁺ , Ti ⁴⁺	(4)	Zr ⁴⁺ , Hf ⁴⁺	
54.		coordination number and respectively	l oxidat	ion state number of Cr in $K_3Cr(C_2O_4)_3$	
	(1)	3 and + 3	(2)	3 and 0	
	(3)	6 and + 3	(4)	4 and + 2	
55.	Ion	ic solids, with Schottky de	efects,	contain in their structure	
	(1)	Cation vacancies only			
	(2)	Cation vacancies and in	terstiti	al cations	
	(3)	Equal number of cation	and an	ion vacancies	
	(4)	Anion vacancies and int	erstitia	l anions	

Question No.	Questions			
56.	Ele	Electrolytic reduction of nitrobenzene in weakly acidic medium gives:		
	(1)	Aniline	(2)	Nitosobenzene
	(3)	N-phenylhydroxylamine	(4)	p-hydroxyaniline
57.	The	efficiency of fuel cell is give	en by	,
	(1)	$\frac{\Delta G}{\Delta S}$	(2)	$\frac{\Delta G}{\Delta H}$
	(3)	$\frac{\Delta S}{\Delta G}$	(4)	$\frac{\Delta H}{\Delta G}$
58.	Thy	mine is:		
	(1)	5-methyluracil	(2)	4-methyluracil
2.	(3)	3-methyluracil	(4)	1-methyluracil
59.	If tl	ne rate of the reaction is equation is	ual t	to the rate constant, the order of the
	(1)	0	(2)	1
	(3)	2	(4)	3
60.		ich of the following polymonomer unit?	er ca	n be formed by using the following
		H ₂ C N H ₂ C C	CH ₂	O .
	(1)	Nylon 6, 6	(2)	Nylon 2-nylon 6
	(3)	Melamine polymer	(4)	Nylon-6

Questions		
Ortho and para hydrogen differ in		
(1) atomic number (2) mass number		
(3) electron spin in two atoms (4) nuclear spin in two atoms		
Which of the following carbonates is least stable		
(1) $MgCO_3$ (2) Na_2CO_3		
(3) K_2CO_3 (4) Rb_2CO_3		
The IUPAC name of the		
Me Me Me Me		
Structure is:		
(1) 2,4,5-triethyl-3-nonene (2) 5,6-diethyl-3-methyl-4-decene		
(3) 2,4,6-triethyl-3-octene (4) 3-ethyl-5-methyl-3-heptene		
The strongest base among the following is:		
$(1) \qquad (2) \qquad \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \end{array}$		
(3) NH ₂ H		
The number of σ -and Π -bonds present in pent-4-ene-1-yne is :		
(1) 10, 3 (2) 4, 9		
(3) 3, 10 (4) 9, 4		
	Ortho and para hydrogen differ in (1) atomic number (2) mass number (3) electron spin in two atoms (4) nuclear spin in two atoms Which of the following carbonates is least stable (1) MgCO ₃ (2) Na ₂ CO ₃ (3) K ₂ CO ₃ (4) Rb ₂ CO ₃ The IUPAC name of the Me M	

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Question No.	Questions				
66.	25 mL of a solution of $Ba(OH)_2$ on titration with 0.1 M solution of $HC\ell$ gave a titre value of 35 mL. The molarity of barium hydroxide solution was				
	(1) 0.07 (2) 0.14				
	(3) 0.28 (4) 0.35				
67.	Identify the least stable among the following:				
*	(1) Li (2) Be				
	(3) B ⁻ (4) C ⁻				
68.	The correct order of size among $C\ell$, $C\ell^+$ and $C\ell^-$ is				
	(1) $C\ell^+ < C\ell^- < C\ell$ (2) $C\ell^+ > C\ell^- > C\ell$				
7 12	(3) $C\ell^+ < C\ell < C\ell^-$ (4) $C\ell^- < C\ell < C\ell^+$				
69.	The geometry of $C\ell O_4^-$ ion is:				
	(1) Pyramidal (2) Tetrahedral				
	(3) Trigonal Planar (4) Trigonal bipyramidal				
70.	The number of orbitals in a subshell is equal to				
	(1) $2\ell - 1$ (2) 2ℓ				
×	(3) ℓ^2 (4) $2\ell + 1$				

Question No.	Questions				
	Part-C {Opt. (i)} (Mathematics)				
71.	The one which is the measure of central tendency is:				
	(1) co-efficient of correlation (2) standard deviation				
	(3) mean deviation (4) mode				
72.	If S be a finite set containing n elements. The the total number of binary operations on S is :				
	(1) n^n (2) 2^{n^2} (3) n^2 (4) n^{n^2}				
	(3) n^2 (4) n^{n^2}				
73.	The solution of the equation $\tan^{-1}(1+x) + \tan^{-1}(1-x) = \frac{\pi}{2}$ is:				
	(1) $x = 1$ (2) $x = -1$				
	(3) $x = 0$ (4) $x = \pi$				
74.	If $A = [a \ b]$, $B = [-b \ -a]$ and $C = \begin{bmatrix} a \\ -a \end{bmatrix}$, then the correct statement				
	is:				
	(1) $A = -B$ (2) $A + B = A - B$				
	$(3) AC = BC \qquad (4) CA = CB$				
75.	The value of λ and μ for which the system of equations $x+y+z=6$, $x+2y+3z=10$ and $x+2y+\lambda z=\mu$ have unique solution are:				
	(1) $\lambda \neq 3, \mu \in \mathbb{R}$ (2) $\lambda = 3, \mu = 10$				
	(3) $\lambda \neq 3, \ \mu = 10$ (4) $\lambda \neq 3, \ \mu \neq 10$				

Question No.	Questions	
76.	If H be the HM between a and b, then the value of $\frac{H}{a} + \frac{H}{b}$ is	- 9
	$(1) \frac{ab}{a+b} \qquad (2) \frac{a+b}{ab}$	
	(3) 2 (4) None of these	
77.	The straight lines $x + y = 0$, $3x + y - 4 = 0$, $x + 3y - 4 = 0$ form a tria which is:	ngle
	(1) right angled (2) equilateral	
	(3) isosceles (4) none of these	
78.	The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis length:	is of
	(1) 3 (2) 4	
	(3) 7 (4) 1	
79.	The value of $\lim_{x \to \infty} \left(\frac{x+3}{x-1} \right)^{x+3}$ is	,
	(1) e (2) e^2	
	(3) e^3 (4) e^4	
80.	If there are 6 girls and 5 boys who sit in a row, then the probability no two boys sit together is:	that
	(1) $\frac{6! \ 7!}{2! \ 11!}$ (2) $\frac{5! \ 7!}{2! \ 11!}$	
	(3) $\frac{6! \ 6!}{2! \ 11!}$ (4) None of these	q

Question No.	Questions		
81.	The order of the differential equation whose solution is		
	$y = a \cos x + b \sin x + c e^{-x}$ is		
	(1) 2 (2) 1		
	(3) 3 (4) None of these		
82.	If $\vec{r} = x \hat{i} + y \hat{j} + z \hat{k}$, then value of $(\vec{r} \cdot \hat{i}) \hat{i} + (\vec{r} \cdot \hat{j}) \hat{j} + (\vec{r} \cdot \hat{k}) \hat{k}$ is		
	(1) 0 (2) 3 r		
	(3) 8 r (4) r		
83.	The vectors $2\hat{i}+3\hat{j}-4\hat{k}$ and $a\hat{i}+b\hat{j}+c\hat{k}$ are perpendicular when:		
	(1) $a = 2, b = 3, c = 4$ (2) $a = 4, b = 4, c = -2$ (3) $a = 5, b = 4, c = 4$ (4) $a = 4, b = 4, c = 5$		
	(3) $a = 5, b = 4, c = 4$ (4) $a = 4, b = 4, c = 5$		
84.	A fair coin is tossed 100 times. The probability of getting tails an odd number of times is:		
	(1) $\frac{3}{8}$ (2) $\frac{1}{2}$ (3) $\frac{1}{8}$ (4) None of these		
	(3) $\frac{1}{8}$ (4) None of these		
85.	The equation $ \vec{r} ^2 - 2(\vec{r} \cdot \vec{a}) + \lambda = 0$ represents a		
	(1) plane (2) straight line		
	(3) sphere (4) none of these		

Question No.	Questions		
86.	Area of the triangle formed by 3 complex numbers $1+i,i-1,2i$ in the Argand plane is		
	(1) $\frac{1}{2}$ (2) 1		
	(3) $\sqrt{2}$ (4) 2		
87.	If the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common, then the value of k is :		
	(1) 3 (2) -3		
	(3) 4 (4) None of these		
88.	The solution of the equation $1 + x-1 \ge 0$ is:		
	(1) $(-\infty, 0)$ (2) $(-2, 0)$		
	$(3) (0, \infty)$ $(4) (0, 2)$		
89.	12 persons are to be arranged to a round table. If two particular persons among them are not to be side by side, the total number of arrangements is:		
	(1) 9 (10!) (2) 2 (10!)		
	(3) 2 (11!) (4) 10!		
90.	The positive integer just greater than $(1 + 0.0001)^{10000}$ is		
	(1) 3 (2) 4		
	(3) 5 (4) None of these		

Question No.	Questions
91.	If A and B are any two sets, then $A - B \neq$
, E	$(1) B \cap A' \qquad (2) A \cap B'$
	(3) $(A' \cup B)'$ (4) None of these
92.	Let R be the relation of the set R of all real numbers defined by aRb iff $ a-b \le 1$. Then R is
	(1) reflexive and symmetric (2) symmetric only
	(3) transitive only (4) anti-symmetric only
93.	If $f(x) = \frac{x-1}{x+1}$, then $f\left(\frac{1}{f(x)}\right)$ equals:
	(1) 0 (2) 1
	(3) x (4) 1/x
94.	Which of the following is correct?
2	(1) $\sin 1^{\circ} > \sin 1$ (2) $\sin 1^{\circ} < \sin 1$
	(3) $\sin 1^\circ = \sin 1$ (4) $\sin 1^\circ = \frac{\pi}{180} \sin 1$.
95.	The cube roots of unity lie on a circle
	(1) $ z-1 = 1$ (2) $ z+1 = 1$
	(1) $ z-1 = 1$ (2) $ z+1 = 1$ (3) $ z = 1$ (4) None of these

Question	Questions				
No.					
96.	The largest value of a third order determinant whose elements are 0 or 1				
	is:				
	(1) 3				
	(3) 1 (4) 0				
97.	The set of all points, where the function $f(x) = \frac{x}{1+ x }$ is differentiable				
	is:				
	$(1) (0, \ \infty) \qquad \qquad (2) (-\infty, \ \infty)$				
	(3) $(-\infty, 0) \cup (0, \infty)$ (4) None of these				
98.	The function f (x) is defined by				
	$f(x) = \begin{cases} \frac{ x+2 }{\tan^{-1}(x+2)}, & x \neq -2 \\ 2, & x = -2 \end{cases}, \text{ then}$				
	$\begin{array}{c} f(x) \text{ is :} \\ (1) \text{ continuous at } x = -2 \end{array}$				
	(1) continuous at $x = -2$ (2) differentiable at $x = -2$				
	 (3) not continuous at x = -2 (4) continuous but not derivable at x = -2 				
99.	If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A \cos 4x + B$, then				
	(1) $A = -\frac{1}{8}$ (2) $A = -\frac{1}{4}$ (3) $A = -\frac{1}{2}$ (4) -1				
100.	The area of the figure bounded by $y = \sin x$, $y = \cos x$ in the first quadrant is:				
	(1) $2(\sqrt{2}-1)$ (2) $\sqrt{3}+1$ (3) $2(\sqrt{3}-1)$ (4) None of these				
	(3) $2(\sqrt{3}-1)$ (4) None of these				

Questions				
Part-C {Opt. (ii)} (Biology)				
GIFT (Gamete intrafallopian transfer) mixes egg and sperm in the				
(1)	Fallopian tube	(2)	Uterus	
(3)	Vagina	(4)	Culture medium	
An	example of merocrine gl	and is		
(1)	Sebaceous gland	(2)	Pineal gland	
(3)	Salivary gland	(4)	Mammary gland	
ATI	Pase enzyme needed for	muscle c	ontraction is located in	
(1)	Actinin	(2)	Troponin	
(3)	Myosin	(4)	Actin	
Cas	parian strips are prese	nt in the	of the root.	
(1)	Pericycle	(2)	Cortex	
(3)	Epiblema	(4)	Endodermis	
The inner, darker and harder portion of secondary xylem that cannot conduct water, in an older dicot stem, is called				
(1)	Bast	(2)	Alburnum	
(3)	Duramen	(4)	Wood	
	(1) (3) An (1) (3) ATI (1) (3) Cas (1) (3) The cond (1)	GIFT (Gamete intrafallopia (1) Fallopian tube (3) Vagina An example of merocrine gland (1) Sebaceous gland (3) Salivary gland ATPase enzyme needed for (1) Actinin (3) Myosin Casparian strips are present (1) Pericycle (3) Epiblema The inner, darker and har conduct water, in an older of (1) Bast	Part-C {Opt. (ii)} (Comparison of the conduct water, in an older dicot stem.) Part-C {Opt. (ii)} (Comparison of the conduct water, in an older dicot stem.) Part-C {Opt. (ii)} (Comparison of the conduct water, in an older dicot stem.)	

Question No.	Questions				
106.	The tendency of population to remain in genetic equilibrium may be disturbed by				
	(1) Random mating (2) Lack of migration				
	(3) Lack of mutation (4) Lack of random mating				
107.	If two pea plants having red (Dominant) colored flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red colored flowers will be				
	(1) Both heterozygous				
*	(2) One homozygous and other heterozygous				
	(3) Both homozygous				
	(4) Both hemizygous				
108.	The deposition of lipids on the wall lining the lumen of large and medium sized arteries is referred to as				
	(1) Osteoarthritis (2) Osteoporosis				
	(3) Stokes-Adams Syndrome (4) Atherosclerosis				
109.	Which of the following matches correctly?				
2	(1) Pulmonary artery - Carries deoxygenated blood to the lungs				
	(2) Superior vena cava – Receives deoxygenated blood from the lower body and organs				
	(3) Inferior vena cava – Receives deoxygenated blood from the head and body				
	(4) Hepatic artery – carries deoxygenated blood to the gut				

Question No.	Questions				
110.	The function of leghemoglobin in the root nodules of legumes is				
	(1) Oxygen removal				
	(2) Inhibition of nitrogenase activity				
	(3) Expression of nif gene				
	(4) Nodule differentiation				
111.	An action potential in the nerve fiber is produced when positive and negative charges on outside and the inside of the axon membrane are reversed because				
	(1) All potassium ions leave the axon				
	(2) More potassium ions enter the axon as compared to sodium ions leaving it				
	(3) More sodium ions enter the axon as compared to potassium ions leaving it				
	(4) All soidum ions enter the axon				
112.	Sequence of taxonomic categories is				
	(1) Divison – Class – Order – Family – Tribe – Genus – Species				
	(2) Class – Phylum – Tribe – Order – Family – Genus – Species				
	(3) Phylum – Order – Class – Tribe – Family – Genus – Species				
	(4) Division – Class – Family – Tribe – Order – Genus – Species				

Question No.	Questions					
113.	In the five-kingdom system of classification, which single kingdom out of the following can include blue green algae, nitrogen-fixing bacteria and methanogenic archaebacteria?					
	(1) Protista (2) Fungi					
	(3) Monera (4) Plantae					
114.	Methanogens are					
	(1) Obligate anaerobic bacteria					
	(2) Aerobic fungi					
-	(3) Aerobic bacteria					
	(4) Obligate anaerobic fungi					
115.	Noise is measured using sound meter and the unit is					
	(1) Hertz					
	(2) Decibel					
	(3) Joule					
	(4) Sound					
116.	Synapsis occurs between					
	(1) mRNA and ribosomes					
*	(2) male and female gametes					
	(3) Two homologous chromosomes					
27	(4) Spindle fibers and centromere					

Question No.	Questions				
117.	A nitrogen fixing microbe associated with Azolla in rice fields is				
t (1)	(1) Frankia	(2)	Tolypothrix		
	(3) Spirulina	\-/	Anabaena		
118.	A patient brought to a hosp immediately given	ital with	n myocardial infarction is normally		
	(1) Cyclosporin-A	(2)	Statins		
	(3) Penicillin	(4)	Streptokinase		
119.	Rotenone is				
	(1) A bioherbicide	(2)	A natural insecticide		
	(3) An insect hormone	(4)	A natural herbicide		
120.	Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as				
	(1) Genetic flow	(2)	Genetic drift		
	(3) Random mating	(4)	Genetic load		
121.	Genetic engineering is connected with				
	(1) Eugenics	(2)	Euthenics		
	(3) Euphenics	(4)	All of these		

Question No.	Questions				
122.	Some people who have suffered from a disease may not be affected again during their life time; such immunity is called				
	(1) Natu	ral immunity	(2)	Acquired immunity	
	(3) Inna	te immunity	(4)	Passive immunity	
123.	Raw chee	se is known as	(1975) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976) (1976)		
	(1) Blue	cheese	(2)	Cottage cheese	
	(3) Swis	s cheese	(4)	None of these	
124.	Cell divis	ion cannot be sto	pped in wl	nich phase of the cell cycle?	
	(1) G ₁ -P	hase	(2)	G ₂ -Phase	
	(3) S-Ph	ase'	(4)	Prophase	
125.	What typ developm	e of plant is for ent of Raphanob	med when crassica?	colchicine is used in the process of	
	(1) Auto	otetraploid	(2)	Haploid	
	(3) Trip	loid	(4)	Allotetraploid	
126.	Seed coat is not thin, membranous in				
	(1) Gro	undnut	(2)	Coconut	
	(3) Mai	ze	(4)	Gram	

Question No.	Questions			
127.	Len	ticels are involved in		
	(1)	Transportation	(2)	Gaseous exchange
	(3)	Food transport	(4)	Photosynthesis
128.	Inse	ect mouthparts are adapte athparts of houseflies are	d for di used fo	fferent functions in different species.
	(1)	Siphoning		
	(2)	Piercing and sucking		
	(3)	Sponging and lapping		-
	(4)	Biting and chewing		
129.	The	e first enzyme to be purific	ed and	crystalized was
	(1)	Urease	(2)	Diastase
	(3)	Insulin	(4)	Zymase
130.	Ma	ny enzymes are secreted	in inac	tive form to protect
	(1)	Cell membrane	(2)	Mitochondria
	(3)	Cell proteins	(4)	Cell DNA
			SALVENOVA PLES TRANSPORT MARKET STORE	
				,
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Question	Α	В	С	D
No.				
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3	4 /	3	4	4
4	1 /	1	3	2
5	3	2	2	1
6	3 ~	2	3	4
7	3 /	4	1	2
8	2 /	4	4	4
9	1 /	3	2	2
10	1 /	2	1	2
11	3 /	3	4	3
12	1 /	1	2	3
13	3 /	4	4	2
14	1 /	2	2	1
15	4 /	1	2	1
16	4 /	3	3	3
17	2 /	1	3	2
18	4 /	3	2	3
19	2/	1	1	1
20	2 /	4	1	2
21	3 /	3	2	2
22	1 /	3	2	4
23	4 /	2	4	4
24	2 /	1	1	3
25	1 -	1	3	2
26	2/	2	3	3
27	4 -	2	2	1
28	4 /	4	3	
29	3 /	1	1	3
30	2/	3	2	
31	3 4	4	3	4
32	2/3/2/	2		2
33	3 /	4	1	2
34	1 /		3	4
35	2 /	2	1	1
36	1 1	2	4	. 3
37	1,' 2 ' 3 '		3	2
	2.	3	2	4
38	2	4	1	1
39	2	3	1	3
40	4	3	4	4
41	3 /	3	2	1
42	1/	2	4	3
43	3./	1	1	1

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44	2/	1	3	1
45	3,	4	4	3
46	4 /	2	1	3
47	4 /	4	3	1
48	2 -	1	1	3
49	1 - 2 - 3 - 1 - 1 - 1 - 3 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	3	1	2
50	1/	4	3	3
51	1 /	4	3	3
52	3 /	1	1	3
53	1 /	2	3	4
54	1/	3	2	3
55	3.1	1 .	3	3
56	2 ~	3	1	3
57	4 /	1	2	2
58	1 ′	3	3	1
59	4 ′ 1 ′ 3 ′	2	2	1
60	4 / 3 / 2 / 1 / 1 / 4 / 3 /	3	4	4
61	3 /	1	3	4
62	2 ′	2	3	1
63	1/	3	4	2
64	1 /	2	3	3
65	4 /	4	3	1
66	3 /	1	4	1
67	3 /	3	1	2
68	4/ 3/ 3/ 1/ 1/ 4/	1	2	3
69	3 /	1	3	2
70	3 ′	3	1	4
71	1/	3	2	4
72	1	4	2	4
73		4	3	3
74	21	2	1	3
75	3/	3	1	1
76	2 /	2	4	3
77	21	2	4	3
78	3 / 1 / 1 / 3 / 3 / 4 / 4 / 4 / 4 / 4 / 4 / 4 / 4	3	3	4
79	1	1	3	4
80	1'	1	1	1
81	3/	1	2	3
82	3 -	1	2	4
83	4-	4	3	4
84	4 /	2	1	2
85	1/	3	1	3
86	4 -/	3	1	2 2
87	4 /	3	1	
88	1 / 4 / 4 / 3 / 3 / 3 /	4	4	3
89	1	4	2	1
90	1	1	3	1

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91	2 /	2	3	1
92		2	4	1
93	3 /	3	4	4
94	1 /	1	2	2
95	1 /	1	3	3
96	3 /	4	3	2
97	4 /	4	3	2
98	2 /	3	4	3
99	3 /	3	4	1
100	3 /	1	1	1
101	3 /	3	2	1
102	2 /	1	2	3
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106	3 /	2	1	4
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109	2 /	1	4	1
110	2 /	3	3	1
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120	3 /	1	4	2
121	2 /	3	3	3
122	2 /	4	1	2
123	3 /	4	3	2
124	1 /	2	1	3
125	3 /	2	2	4
126	3 ~	1	4	2
127	1 /	3	1	2
128	3 /	3	4	3
129	1 /	4	1	1
130	2	3	1	3 \
		9	1	3 \

Moore May