

ARMY PUBLIC SCHOOL, TEZPUR
SUMMER HOLIDAY HOMEWORK
CLASS: XII SCIENCE SESSION: 2020-21

SUBJECT	HOMEWORK
PHYSICS	<ol style="list-style-type: none"> 1. Show that the shortest wavelength lines in Lyman, Balmer and Paschen series have their wavelengths in the ratio 1:4:9. 2. Two thin lenses of focal lengths 10 cm and -5 cm are kept in contact. What is the focal length and power of the combination? 3. A parallel plate capacitor has plates of area 200 cm² and separation between the plates is 1.0 mm. What potential difference will be developed if a charge of 1.0 nC is given to the capacitor? If the plate separation is increased to 2.0 mm, what will be the new potential difference? 4. A radio can tune to any station in the 7.5 MHz to 12 MHz band. What is the corresponding wavelength band? 5. If the critical angle for light going from medium A to B is θ, then find the speed of light in medium B, if the speed of light in medium A is v. 6. A radioactive substance has a half life of 60 days. Find out the disintegration constant. 7. The total magnification produced by a compound microscope is 20, while that produced by the eyepiece alone is 5. When the microscope is focused on a certain object, the distance between the objective and eyepiece is 14 cm. Find the focal length of objective and eyepiece, if distance of distinct vision is 20 cm. 8. Three charges each equal to q are placed at the corners of a square of side a. Find the electric field at the fourth corner. 9. A metal cube of length 0.1m is charged by 12 μC. Calculate the surface charge density. 10. Calculate the field due to an electric dipole of length 10cm and consisting of charges of $\pm 100\mu\text{C}$ at a point 20cm from each charge. 11. A point charge of 17.7μC is located at the centre of a cube of side 0.03m. Find electric flux through each face of the cube. 12. An infinite line charge produces a field of $9 \times 10^4 \text{NC}^{-1}$ at a distance of 4cm. Calculate the linear charge density. 13. Two large metal plates each of area 1m² are placed facing each other at a distance of 10cm and carry equal and opposite charges on their faces. If the electric field between the plates is 100NC^{-1}, find the charge on each plate. 14. Calculate the distance between two protons such that the electric repulsive force between them is equal to the weight of either. 15. Two point charges A and B of values 15μC and 9μC are kept 18 cm apart in air. Calculate the work done when charge B is moved by 3 cm towards A.

16. A capacitor of $20\mu\text{F}$ is charged to a potential of 10kV . Find the charge accumulated on each plate of the capacitor.
17. A parallel plate capacitor has plates of area 200 cm^2 and separation between the plates is 1.0 mm . What potential difference will be developed if a charge of 1.0 nC is given to the capacitor? If the plate separation is increased to 2.0 mm , what will be the new potential difference?
18. How many electrons must be added to one plate and removed from other so as to store 25.0 J of energy in a 5.0 nF parallel plate capacitor?
19. A parallel plate capacitor having plate area 100 cm^2 and separation 1.0 mm holds a charge of $0.12\text{ }\mu\text{C}$ when connected to a 120 V battery. Find the dielectric constant of the material filling the gap.
20. Calculate the potential at the centre of a square ABCD of each side $\sqrt{2}\text{ m}$ due to charges $2, -2, -3$ and $6\text{ }\mu\text{C}$ at four corners of it.

NOTE- ANSWERS TO THESE QUESTIONS TO BE WRITTEN IN HOMEWORK NOTEBOOK OR A4 PAPER.

CHEMISTRY

1. Find the $2/3^{\text{rd}}$ life ($t_{2/3}$) of a first order reaction.
2. For a certain reaction, it takes 5 minutes for the initial concentration of 0.5 mol/liter to become 0.25 mol/liter and another 5 minutes to become 0.125 mol/liter . What is the rate constant of the reaction?
3. For a first order reaction when $\log K$ was plotted against $1/T$, a straight line with a slope -600 was obtained. What is the activation energy?
4. For a reaction, the energy of activation is zero. What is the value of rate constant at 300 K if $k = 1.6 \times 10^6\text{ s}^{-1}$ at 280 K ? ($R = 8.31\text{ J K}^{-1}\text{ mol}^{-1}$).
5. The experimental data for the reaction $2\text{A} + \text{B}_2 \rightarrow 2\text{AB}$ is as follows:

Expt. No	[A] (mol L ⁻¹)	[B] (mol L ⁻¹)	Rate (mol L ⁻¹ s ⁻¹)
1.	0.50	0.50	1.6×10^{-4}
2.	0.50	1.00	3.2×10^{-4}
3.	1.00	1.00	3.2×10^{-4}

Write the most probable equation for the rate of reaction giving reason for your answer.

6. At 380°C , the half-life period for the first order decomposition of H_2O_2 is 360 min . The energy of activation of the reaction is 200 kJ mol^{-1} , Calculate the time required for 75% decomposition at 450°C .
7. For the coagulation of 100 mL of arseniousulphide sol, 5 ml of 1 M NaCl is required. What is the flocculation value of NaCl ?
8. The equivalent conductance of an infinitely dilute solution of NH_4Cl is 150 and ionic conductances of OH^- and Cl^- ions are 198 and 76 respectively.

	<p>What will be the equivalent conductance of the solution of NH_4OH at infinite dilution.</p> <p>9. At 18°C the mobilities of NH_4^+ and ClO_4^- ions are 6.6×10^{-4} and $5.7 \times 10^{-4} \text{cm}^2 \text{volt}^{-1} \text{sec}^{-1}$ at infinite dilution. Calculate equivalent conductance of ammonium chlorate solution.</p> <p>10. Calculate K_a of acetic acid if its 0.05N solution has equivalent conductance of 7.36 mho cm^2 at 25°C ($\Lambda_{\text{CH}_3\text{COOH}}^0 = 390.7$)</p> <p>11. The specific conductance of a saturated solution of AgCl at 25°C after subtracting the specific conductance of conducting water is $2.28 \times 10^{-6} \text{ mho cm}^{-1}$. Find the solubility product of AgCl at 25°C. ($\Lambda_{\text{AgCl}}^0 = 138.3 \text{ mho cm}^2$)</p> <p>12. What is the strength in g/litre of a solution of H_2SO_4, 12 cc of which neutralizes 15 cc of N/10 NaOH solution?</p> <p>13. How many millilitres of a 0.05M KMnO_4 solution are required to oxidize 2.0 g of FeSO_4 in a dilute acid solution?</p> <p>14. A bottle of commercial sulphuric acid (density 1.787 g/ml) is labeled as 86% by weight. What is the molarity of the acid? What volume of the acid has to be used to make 1 litre of 0.2 M H_2SO_4?</p> <p>15. A solution of 0.4 g sample of H_2O_2 reacted with 0.632 g of KMnO_4 in the presence of sulphuric acid. Calculate the percentage purity of the sample of H_2O_2.</p> <p>NOTE- ANSWERS TO ALL THE ABOVE QUESTIONS TO BE WRITTEN IN AN ASSIGNMENT NOTEBOOK OR A4 SIZED PAPER.</p>						
BIOLOGY	<p>1. Write the back exercise questions of NCERT Textbook Ch-1,2,5,6 and 7 in the class notebook.</p> <p>2. Draw labeled diagrams of the following:</p> <ol style="list-style-type: none"> L.S. of an embryo of grass. Enlarged view of microsporangium of an angiosperm Conidia of <i>Penicillium</i>. Lac Operon The process of translation of mRNA. <p>3. Draw the pedigree of the given family whose ages are given below in the bracket</p> <table style="margin-left: 40px; border: none;"> <tr> <td>Normal father (68)</td> <td>Carrier mother (62)</td> <td>Normal son (40)</td> </tr> <tr> <td>Affected son (38)</td> <td>Carrier daughter (35)</td> <td>Normal daughter (31)</td> </tr> </table> <p>If this family can never have an affected girl then with the help of Punnet Square method, show whether this disease can be phenylketonuria or not? (Take the alleles as A and a).</p> <p>4. Write a brief story of Evolution of Man.</p>	Normal father (68)	Carrier mother (62)	Normal son (40)	Affected son (38)	Carrier daughter (35)	Normal daughter (31)
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Affected son (38)	Carrier daughter (35)	Normal daughter (31)					

	<p>NOTE: Q.2 to Q.4 to be written in A4 sized paper or a separate assignment notebook.</p>																				
<p>INFORMATICS PRACTICES</p>	<ol style="list-style-type: none"> 1. WAP to display any circle.(User enter the any radius) 2. WAP to display bar graph on the basis of name city. 3. WAP to display line graph of $y=x+10$. 4. WAP generate hundred random number between 2 to 5 and export to csv file. 5. We have following Data's. 111,222,333,444,555,666,777,888,999 <ol style="list-style-type: none"> i. Write the python code to display from last four data's. ii. Write the python code to display first three by index values. 6. WAP to generate the following Data Frame. <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>3</td> <td>7</td> <td>8</td> </tr> <tr> <td>1</td> <td>44</td> <td>5</td> <td>6</td> </tr> <tr> <td>2</td> <td>27</td> <td>50</td> <td>40</td> </tr> <tr> <td>3</td> <td>22</td> <td>24</td> <td>46</td> </tr> </tbody> </table> <ol style="list-style-type: none"> I. Also write codes to display only multiple of three. II. Display Data Frame in descending order by index. 7. WAP display the scatter plot on the basis of name corresponding age. 8. WAP to enter ten students name and marks corresponding grade will display through Data Frame. There are following grading rule. Marks ≥ 90 Grade A+ Marks 70 – 90 Grade A Marks 60 – 70 Grade B Marks 50 – 60 Grade C Marks 40 – 50 Grade D Marks < 40 Grade F 9. What will be output of the following statement? <ol style="list-style-type: none"> a. <code>select substr('awesindiaapstezpur',(-5%9),(2*2));</code> b. <code>select truncate(1431.99,-1);</code> c. <code>select round(18679.99,-2);</code> d. <code>Select round((length('your_problem-is_very_esssay')*(5.879)), -4);</code> e. <code>Select char(mod((100+3),(51*11)));</code> 10. The following two statements are giving different outputs. What may be possible reason <code>SELECT COUNT(*) FROM EMPLOYEE;</code> <code>SELECT COUNT(SALARY) FROM EMPLOYEE;</code> 11. Correct the following code. <code>A1=range(10,50,12)</code> <code>B1=range(90,200,20)</code> <code>Matplotlib.pyplot.plot(A1,B1)</code> 12. Find the output of following code segments: <code>L1= [i * 3 – 5 for i in range(3,7)]</code> <code>print(L1)</code> 		A	B	C	0	3	7	8	1	44	5	6	2	27	50	40	3	22	24	46
	A	B	C																		
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1	44	5	6																		
2	27	50	40																		
3	22	24	46																		

MATHEMATICS	Worksheet will be sent through Google classroom
PSYCHOLOGY	Worksheets for chapters 1 to 5 will be sent through Google classroom.
HINDI	<ol style="list-style-type: none"> 1. Give a typed article for school magazine 2. Book review of any Hindi book. 3. Complete the written work of the covered syllabus.
ENGLISH	<ol style="list-style-type: none"> 1. All written work to be completed. 2. Writing section: <ol style="list-style-type: none"> a. International Yoga Day was celebrated in the school premises of Army Public School, Tezpur on 21st June 2019. As the city correspondent, write a report in 200 words for the city magazine, The Today 10marks. b. You are Radha/ Rajesh.As part of E- learning promotion drive; your school was invited to visit 'The New Learning-E-learning ', a prominent E-learning company. Write a report on the visit for your school magazine in 200 words. 10marks c. You are Aniket/ Ankita. You participated in a career counselling programme organised by 'Careers'. You had the opportunity of listening to professionals from various fields like food technology, Biometric Sciences, nanotechnology, media management, etc. Write a report of the programme in 150-200 words for 'Employment Avenues'. 10marks d. Taking a gap year between finishing high school and starting university has many advantages. Write a debate both for and against the motion. 10 marks. e. A number of your classmates (especially those from science streams) bunk their classes in order to attend coaching centres. Write a debate in 200 words on ' Tuition at coaching centres is not essential '. 10marks 3. All the Worksheets will be sent through Google classroom.
PHYSICAL EDUCATION	<ol style="list-style-type: none"> 1. Make final practical copy for class XII board exam. 2. Make a fixture of 35 teams by knock out cum league method. 3. Make a fixture of 13 teams by cyclic method. 4. Make a second type of consolation tournament of 14 teams. 5. Make a first type of consolation tournament of 17 teams. 6. Make a concept map on each food nutrition. 7. Make a short notes on following topics: <ol style="list-style-type: none"> a) Slow twitch fiber and fast twitch fiber

- b) Oxygen intake
- c) Oxygen uptake
- d) Oxygen transport
- e) Stroke volume
- f) Cardiac output
- g) Tidal air capacity
- h) Residual air volume
- i) Vital air capacity

8. Draw the stick diagrams for remedial exercises of Kyphosis. Here first give the exercise no. then draw the diagrams
9. Draw the stick diagrams for remedial exercises of Lordosis. Here first give the exercise no. then draw the diagrams.
10. Draw the stick diagrams for remedial exercises of Scoliosis. Here first give the exercise no. then draw the diagrams.
11. Draw the stick diagrams for remedial exercises of Knock-knees. Here first give the exercise no. then draw the diagrams.
12. Draw the stick diagrams for remedial exercises of bow legs. Here first give the exercise no. then draw the diagrams.
13. Draw the stick diagrams for remedial exercises of round shoulder. Here first give the exercise no. then draw the diagrams.