


ENGLISH
SUBMISSION DATE : 27.6.17

1. Write a Book Review on “The Invisible Man” by H.G Wells, as per the format given below and submit in a folder.

S. No.	CONTENT
1.	Analysis of any three main characters.
2.	Evaluation of Plot and structure
3	Conclusion

2. Design a different and original cover-page for the novel ‘The Invisible Man’. Use it as the cover page for the “Book Review” folder.
3. Here is a list of practical vocabulary words that will help you read and write with better accuracy. Find the meaning of each word and frame sentences with them. Use as many words as you can to make a paragraph, story or poetry. Have fun!!

(Write all this on A4 sheets and add them to the ‘Book Review’ Folder)

Aesthetics	Inundation	Lackadaisical	Discrepant
Coalesce	Misogyny	Patrimony	Evangelical
Nosedive	Dichotomy	Cosmopolitanism	Sacrosanct
Paramour	Philanderer	Vapid	Ramification
Renunciation	Sentient	Epicurean	Parity

PHYSICS
Submission Date: 21/06/2017

Complete the allotted project report in the following order

- Index
- Aim
- Theory
- Procedure

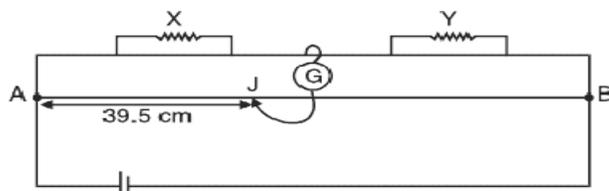


- Observations
- Result
- Bibliography

II Complete the Physics practical file.

III Complete the following assignment and submit in Physics notebook

1. A wire of 20 ohm resistance is stretched to thrice its original length. What will be its
(i) new resistivity, and (ii) new resistance ? { $R' = 180 \text{ ohm}$ }
2. A voltage of 30 V is applied across a colour coded carbon resistor with first, second and third rings of blue, black and yellow colours. What is the current flowing through the resistor? { $0.5 \times 10^{-4} \text{ A}$ }
3. A wire of uniform cross-section and length l has a resistance of 16 ohm. It is cut into four equal parts. Each part is stretched uniformly to length l and all the four stretched parts are connected in parallel. Calculate the total resistance of the combination so formed. Assume that stretching of wire does not cause any change in the density of its material. { $R = 16 \text{ ohm}$ }
4. Name two factors on which electrical resistivity depends. A carbon resistor has a value of 62 kohm with a tolerance of 5%. Give the colour code of resistor.
5. In a meter bridge, the balance point is found to be 39.5 cm from end A. The resistance Y is 12.5 ohm. Determine unknown resistance X. {8.16 ohm}



6. In a potentiometer arrangement a cell of 1.25 V gives a balance point of 35 cm length of the wire. If the cell is replaced by the other cell, then the balance point shifts to 63 cm. What is the emf of the second cell {2.25 V}
7. An electric heater and an electric bulb are rated 500 W, 220V and 100W, 220V respectively. Both are connected in series to a 220 V d.c. mains. Calculate the power consumed by (i) the heater and (ii) electric bulb.
8. A dry cell of emf 1.6 V and internal resistance 0.10 ohm is connected to a resistor of resistance R ohm. If the current drawn from the cell is 2 A, then (i) what is the voltage drop across R ? (ii) what is the energy dissipation in the resistor?
9. Two cells of emfs 1.5V and 2V and internal resistances 2Ω and 1Ω respectively have their negative terminals joined by a wire of 6Ω and positive terminals by a wire of 4Ω resistance. A



third resistance of wire of 8Ω connects middle points of these wires. Draw the circuit diagram. Using Kirchhoff laws, find the potential difference at the end of this third wire.

10. Two wires X, Y have the same resistivity, but their cross-sectional areas are in the ratio 2:3 and lengths in the ratio 1:2. They are first connected in series and then in parallel to a d.c. source. Find out the ratio of drift speeds of the electrons in the two wires for the two cases.

{ 3:2 & 2:1 }

11. Find the relaxation time for free electrons in copper, if the density of mobile electrons is $8.4 \times 10^{28} \text{ m}^{-3}$. The resistivity of copper at room temperature is $1.7 \times 10^{-8} \Omega\text{m}$.

12. A metal wire is bent in a circle of radius 10 cm. It is given charge of 200 microcoulomb which spreads on it uniformly. Calculate the electric potential at its centre. { $18 \times 10^6 \text{ V}$ }

13. What is the relevance of large value of $k=81$ of water?

14. Electric charge is distributed uniformly on the surface of a spherical rubber balloon. Show how the value of electric intensity and potential vary (i) on the surface (ii) inside and (iii) outside?

15. A thin metal sheet is placed in the middle of a parallel plate capacitor. What will be the effect on capacitance?

16. Two point electric charges of unknown magnitude and size are placed at a distance 'd' apart. The electric field intensity is zero at a point, not between the charges but on line joining them. Write the essential conditions for this to happen.

17. An infinite plane sheet of charge density 10^{-8} Cm^{-2} is held in air. In this situation how far apart are two equipotential surfaces whose p.d. is 5 V ? { 8.85 mm }

18. Two point charges A and B of values $+15\mu\text{C}$ and $+9\mu\text{C}$ are kept 18 cm apart in air. Calculate the work done when charge B is moved by 3cm towards A. { 1.35 J }

19. What is the amount of work done in moving a 100 nC charge between two points 5 cm apart on an equipotential surface ?

20. The electric field and electric potential at any point due to a point charge kept in air is 20 NC⁻¹ and 10 JC⁻¹ respectively. Compute the magnitude of this charge.

21. Net capacitance of three identical capacitors in series is 1micro F. What will be their net capacitance if connected in parallel ? Find the ratio of energy stored in the two configurations if they are both connected to the same source.

22. A 10 micro F capacitor is charged by a 30 V d.c. supply then connected across an uncharged 50 micro F capacitor. Calculate (i) the final potential difference across the combination and (ii) the initial and final energies. . How will you account for the difference in energy ?


CHEMISTRY

- I Complete the allotted project report (typed and printed) in the following order
- Index
 - Name of the experiment
 - Theory
 - Procedure
 - Observations
 - Inference
 - Bibliography
- II Complete the Chemistry practical file (4 experiments of volumetric analysis + 10 experiments of salt analysis)
- III Complete the following assignment in the chemistry notebook

CHAPTER-4 CHEMICAL KINETICS

1. What are photochemical and pseudo first order reaction. Give one example for each.
2. Differentiate between the order and molecularity of a reaction
3. For an elementary reaction expressed as $\text{Cl}_2(\text{g}) + 2 \text{NO}(\text{g}) \rightarrow 2 \text{NO}(\text{g})$, the rate is expressed as $\text{rate} = k[\text{Cl}_2][\text{NO}]^2$. What is the molecularity and overall order of this reaction?
4. For a reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2 \text{NH}_3(\text{g})$, the rate of disappearance of H_2 is $2 \times 10^{-2} \text{ mol/sec}$. Calculate the rate of disappearance of N_2 and appearance of NH_3 . Also calculate the rate of reaction
5. Explain why the half-life of a first order reaction is independent of the initial concentration of the reactant.
6. A substance with initial concentration of 10 mol/L follows a zero order reaction with $k = 5 \text{ mol L}^{-1} \text{ s}^{-1}$, calculate the time taken for completion of the reaction.
7. For reaction $\text{X} \rightarrow \text{Y}$, the rate of reaction becomes 3 times as the concentration of reactant is increased 27 times. Calculate the order of the reaction
8. The rate constant of a reaction is $2 \times 10^{-2} \text{ L mol}^{-1} \text{ s}^{-1}$. Calculate the order of the reaction.
9. The half-life time of a reaction is 50 minutes. What will be the order of the reaction if reaction goes to completion in 100 minutes?
10. What are effective collisions?
11. Why with every 10° increase in temperature the rate of reaction is almost doubled?
12. The reaction $\text{SO}_2\text{Cl}_2 \rightarrow \text{SO}_2 + \text{Cl}_2$ is a first order reaction with half-life of $3.15 \times 10^4 \text{ s}$ at 3000 K . What is the percentage of SO_2Cl_2 decomposed on heating it for 90 min?
13. A first order reaction is 20% complete in 20 minutes. Calculate the time taken for 80% completion of reaction.



14. 60 % of the first order reaction is complete in 60 minutes. What is the half-life time of this reaction?
15. For a reaction of decomposition of $2\text{N}_2\text{O}_5 \rightarrow 2\text{NO}_2 + \text{O}_2$, calculate the mole fraction of N_2O_5 decomposed at constant volume and temperature, if the initial pressure is 600Hg and the final pressure is 960 Hg.
16. The decomposition of phosphine : $4\text{PH}_3(\text{g}) \rightarrow \text{P}_4 + 6\text{H}_2(\text{g})$ under constant volume the following data is obtained:-

SNo.	Time	Pressure/atm
1	0	0.2
2	100	0.45

Calculate the rate of reaction when the total pressure is 0.6atm

- 17 .The time required for 10% completion of a first order reaction at 298 K is equal to that required for 25% completion at 308 K. calculate activation energy.

MATHEMATICS

Submission Date: 23/06/2017

Complete the following assignment in Maths notebook

- If $\tan^{-1}1 + \tan^{-1}(1/2) = \tan^{-1}\alpha$, find α .
- Evaluate $\sin [\pi - \sin^{-1}(-1)]$.
- Prove that $\cos^2(\tan^{-1}2) + \sin^2(\cot^{-1}3) = 3/10$.
- Find the principal value of $\tan^{-1}[\sin(\sin^{-1}x + \cos^{-1}x)]$, $x \in [-1, 1]$.
- Evaluate $\sin\{1/2 \cos^{-1}(4/5)\}$.
- Evaluate: $\cos(\pi/3 - \sin^{-1}(\sqrt{3}/2))$.
- Prove that: $4 \tan^{-1} \frac{1}{5} - \tan^{-1} \frac{1}{70} + \tan^{-1} \frac{1}{99} = \frac{\pi}{4}$
- Prove: $2 \tan^{-1}(1/2) + \tan^{-1}(1/7) = \tan^{-1}(31/17)$
- Solve for x: $\tan^{-1}2x + \tan^{-1}13x = \pi/4$
- Show that $\sin^{-1} 12 /13 + \cos^{-1} 4/5 + \tan^{-1} 63/1$
- Prove that

$$\tan \left(\frac{\pi}{4} + \frac{1}{2} \cos^{-1} \frac{a}{b} \right) + \tan \left(\frac{\pi}{4} - \frac{1}{2} \cos^{-1} \frac{a}{b} \right) = \frac{2b}{a}$$



12. Prove: $2 \tan^{-1}(1/2) + \tan^{-1}(1/7) = \tan^{-1}(31/17)$.

13. Solve for x: $\tan^{-1}2x + \tan^{-1}3x = \pi/4$.

14. Prove that $\tan^{-1}(1/5) + \tan^{-1}(1/7) + \tan^{-1}(1/3) + \tan^{-1}(1/8) = 1$.

15. Prove that $\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right) = \frac{\pi}{4} - \frac{1}{2} \cos^{-1}x, -\frac{1}{\sqrt{2}} \leq x \leq 1$

16. Prove that $\cot^{-1}\left(\frac{\sqrt{1+\sin x}-\sqrt{1-\sin x}}{\sqrt{1+\sin x}+\sqrt{1-\sin x}}\right) = \frac{x}{2}, x \in \left(0, \frac{\pi}{4}\right)$

17. Prove that $\tan^{-1}\left(\frac{\sqrt{1+\cos x}+\sqrt{1-\cos x}}{\sqrt{1+\cos x}-\sqrt{1-\cos x}}\right) = \frac{\pi}{4} + \frac{x}{2}$

18. Write in simplest form: $\tan^{-1}\left(\frac{a \cos x - b \sin x}{b \cos x + a \sin x}\right)$.

19. If $A = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 4 \\ 5 & 1 \end{bmatrix}$, verify $(AB)^{-1} = B^{-1}A^{-1}$.

20. Split matrix $\begin{bmatrix} 3 & 1 & 1 \\ 2 & 3 & 4 \\ 1 & 0 & 1 \end{bmatrix}$ in two matrices, one of which is symmetric and the other is skew-symmetric.

21. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ verify $A^2 - 5A + 7I = 0$, hence find A^{-1} .

22. Find the inverse of $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 4 & 1 \\ 2 & 1 & 0 \end{bmatrix}$, using elementary row transformation.

23. If $A' = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$ find $(A+2B)'$.

24. If $A = \begin{bmatrix} -1 & 4 \\ 3 & -7 \end{bmatrix}$, verify that $(A^2)' = (A')^2$.

25. If $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$ then verify that

$(A+B)' = A'+B'$ (ii) $(A-B)' = A'-B'$

26. For the matrix $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$, verify that

(i) $(A+A')$ is a symmetric matrix. (ii) $(A-A')$ is a skew-symmetric matrix.

27. Using elementary column transformations, find the inverse of the following matrices:

(i) $\begin{bmatrix} 3 & -1 \\ -4 & 2 \end{bmatrix}$

(ii) $\begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}$



28. Prove , using the properties of determinants

$$(i) \begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (a-b)(b-c)(c-a) \quad (ii) \begin{vmatrix} a & b & c + \beta \\ a & b + \beta & c \\ a + \beta & b & c \end{vmatrix} = \beta^2(a + b + c + \beta)$$

$$(iii) \begin{vmatrix} a & b & c \\ ab & bc & ca \\ a^2 & b^2 & c^2 \end{vmatrix} = abc \quad (iv) \begin{vmatrix} 1 + a & 1 & 1 \\ 1 & 1 + b & 1 \\ 1 & 1 & 1 + c \end{vmatrix} = abc \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right)$$

$$(v) \begin{vmatrix} x + y & x & x \\ 6x + 4y & 4x & 6x \\ 10x + 8y & 8x & 3x \end{vmatrix} = x^3 \quad (vi) \begin{vmatrix} y + z & z & y \\ z & z + x & x \\ y & x & x + y \end{vmatrix} = 4xyz$$

$$(vii) \begin{vmatrix} a - b - c & 2a & 2a \\ 2b & b - c - a & 2b \\ 2c & 2c & 10a - 6b + 3c \end{vmatrix} = (a + b + c)^3$$

29. Find the quadratic function defined by $f(x) = ax^2 + bx + c$, if $f(0) = 6$, $f(2) = 11$ and $f(-3) = 6$, using matrix method.

30. Find the product $\begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix} \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, using the product solve the following system of equations :

$$x - y = 3$$

$$2x + 3y + 4z = 17$$

$$y + 2z = 7$$

BIOLOGY

Submission Date: 27/06/2017

-  Please update you lab record.
-  Please complete your project report
-  Please do the following questions in your note book.

Q.1 Calculate the length of the DNA of bacteriophage lambda that has 48502 base pairs.

Q.2 Mentions the role of the codons AUG and UGA during proteins synthesis.



- Q.3 Name the enzyme involved in the continuous replication of DNA strand. Mention the polarity of template strand.
- Q4 Mentions the two additional processing which hnRNA needs to undergo after splicing so as to become functional.
- Q5. Why hnRNA is required to undergo splicing?
- Q6. State which human chromosome has:
- (i) the maximum number of genes?
 - (ii) the least number of genes?
- Q7. A polypeptide having 800 amino acids will be coded for by a linear sequence of how many bases in
- (i) DNA
 - and
 - (ii) mRNA
- Q8. State any one reason to explain why RNA viruses mutate and evolve faster than other viruses.
- Q.9 (a) Draw a neat labelled diagram of a nucleosome.
(b) Mention what enables histones to acquire a positive charge.
- Q.10 Write the full form of VNTR. How is VNTR different from 'probe'?
- Q.11 Explain the dual function of AUG codon. Give the sequence of bases it is transcribed from and its anticodon.
- Q.12 Give one function each of histone protein and non-histone chromosomal protein in an eukaryotic cell.
- Q.13 In a maternity clinic, for some reasons, the authorities are not able to hand over two new borns to their respective real parents. Name and describe the technique that you would suggest to sort out the matter.
- Q14 A DNA segment has a total of 1000 nucleotides, out of which 240 of them are adenine containing nucleotides. How many pyrimidine bases this DNA segment possesses?
- Q.15 Why both the DNA strands are not copied during transcription?

**SACHDEVA
GLOBAL SCHOOL**

- Q.16 “Sweet potato tubers and potato tubers are the result of convergent evolution.” Justify.
- Q.17 Name the common ancestor of great apes and man.
- Q.18 Mention how is mutation theory of Hugo deVries different from Darwin’s theory of Natural Selection?
- Q.19 When does a species become founders to cause founder effect?
- Q.20 Study the ladder of human evolution and answer the following questions:
- (a) Where did Australopithecus evolve?
- (b) Write the scientific name of Java man.
- Q.21 Name the five factors which affect Hardy-Weinberg equilibrium.
- Q.22 What do you mean by biogenesis?
- Q.23 State a reason for the increased population of dark coloured moths coinciding with the loss of lichens (on tree barks) during industrialization period in England.
- Q.24 How is genetic drift different from gene migration? Explain.

COMPUTER SCIENCE**Submission Date: 21/06/2017**

Q1. Complete the following assignment in Computer science notebook.

Data Representation

1. What is the full form of bit, ASCII, ISCII?
2. Determine the octal equivalent of the following binary numbers.
(i) 011001 (ii) 10101000110
3. Determine the Hexa Decimal equivalent of the following binary numbers.
(i) 101111100001 (ii) 10101111
4. Convert 120_{16} to its Decimal equivalent
5. Convert 25.25_{10} its binary equivalent.

Getting Started with C++

1. What is the difference between keyword and an identifier?
2. What are literals in C++? How many types of literals are allowed in C++?
3. What is the difference between 'a' and "a" in C++?
4. Differentiate between Syntax and semantic errors with example.

Flow of Control

1. What is meant by an entry-controlled loop? Which C++ loops are entry-controlled?
2. What is meant by an exit-controlled loop? Which C++ loops are exit-controlled?
3. Write a program to find the factorial of a given number.
4. Write a program to print Fibonacci series (10 terms).

Q6. Make a Project on any one of the following topics:

1. Super Market Inventory System
2. Library Management System
3. Railway Ticket Reservation System
4. School Management System
5. Hospital Management System
6. Banking System

Your report should include the following:

1. Acknowledgement
2. Preface
3. Index
4. Project Introduction
5. Code
6. Text and any other files used in the project
7. Code output

Please provide a softcopy of the program in the CD



INFORMATICS PRACTICES

Q1. Make a Project file on any one of the following topics:

1. Super Market Inventory System
2. Library Management System
3. Railway Ticket Reservation System
4. School Management System
5. Hospital Management System
6. Banking System
7. Quiz Program

Your report should include the following:

1. Acknowledgement
2. Preface
3. Index
4. Project Introduction
5. Code
6. Text and any other files used in the project
7. Code output

Please provide a softcopy of the program in the CD

PHYSICAL EDUCATION

Submission Date: 21/06/2017

Complete the following reports in Record File

1. Write benefits of Yoga asnas (10), Swiss ball and Pollymetric.
2. Athletics – Middle and Long Distance runs and Throws. (The events must be other than from those administered under Physical Fitness Test).
3. Draw a neat diagram of the Field/ Court of any one Game of choice (Athletics, Basketball, Football, Handball, Hockey, KhoKho and Volleyball). Write its history, rules & regulations, terminologies and important tournaments.
4. Measure Resting Heart Rate and Respiratory Rate of ten members from family or neighbourhood for three weeks and show graphical representation of the data.

Happy Holidays!