


CLASS - XII
COMMERCE
ENGLISH

Read 'The Invisible Man' by H.G Wells and write a Book Review discussing the following aspects:

- The novel as a cautionary tale
- Griffin as the anti-hero
- The adaptations of the novel

The review is to be written in A4 sheets and submitted in a file. Marks will be given on the basis of content, presentation, originality and expression.

MATHEMATICS

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: $\tan^{-1}2x + \tan^{-1}3x = \pi/4$
- Show that $\sin^{-1} 12/13 + \cos^{-1} 4/5 + \tan^{-1} 63/16 = \pi$.
- Prove that

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

- 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

$$(A+B)' = A' + B' \quad \text{(ii) } (A-B)' = A' - B'$$

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

$$(i) (A+A') \text{ is a symmetric matrix.} \quad (ii) (A-A') \text{ is a skew – symmetric matrix.}$$

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

$$(i) \begin{bmatrix} 3 & -1 \\ -4 & 2 \end{bmatrix} \quad (ii) \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}$$

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. If $y = \operatorname{cosec}^{-1}x, x > 1$, show that

$$x(x^2 - 1)y'' + (2x^2 - 1)y' = 0$$

30. If $x^m y^n = (x + y)^{m+n}$, prove that $\frac{dy}{dx} = \frac{y}{x}$

31. If $x = a \cos^3 \theta$ and $y = a \sin^3 \theta$, then find the value of y'' at $\theta = \frac{\pi}{6}$

32. If $y = x^x$, prove that $y'' - \frac{1}{y}(y')^2 - \frac{y}{x} = 0$

33. Differentiate $x^{\cos x} + (x^2 - 1)/x^2 + 1$ with respect to x .

BUSINESS STUDIES

Each student to prepare and submit his/her allotted project report on topic **BUSINESS ENVIRONMENT/ MANAGEMENT PRINCIPLES** in the following format:-

- ✓ Length of the projects should be 25 to 30 pages.
- ✓ Project should be hand written and presented in a neat file.
- ✓ Cover page should include the title, student information, school and year.
- ✓ List of contents:



- ❖ Acknowledgements and preface(acknowledging the institution, the places visited and person helped)
- ❖ Introduction
- ❖ Details of topic
- ❖ Explanation of content
- ❖ Planning and activities done during the project
- ❖ Observations and findings of the visit.
- ❖ Conclusions(summarized suggestions or findings)
- ❖ Photographs
- ❖ Appendix

ACCOUNTANCY

Each student to prepare and submit his/her project report on

Topic- 1.Journal, ledger, balance sheet and Ratios

2. Cash flow statement.

Following essentials are required to be fulfilled for its preparation and submission.

- ✓ Length of the projects should be 25 to 30 pages.
- ✓ Project should be hand written and presented in a neat file.
- ✓ Cover page should include the title, student information, school and year.
- ✓ List of contents:
 - ❖ Acknowledgements and preface(acknowledging the institution, the places visited and person helped)
 - ❖ Introduction
 - ❖ Details of topic and the case study.
 - ❖ Explanation of content.
 - ❖ Preparation of Journal and Ledger accounts.
 - ❖ Preparation of trading accounts, profit and loss account and balance Sheet.
 - ❖ Calculations of various ratios.
 - ❖ Preparation of cash flow statement.
 - ❖ Various bar graphs and Pie Charts.
 - ❖ Conclusions(summarized suggestions or findings)
 - ❖ Photographs.



ECONOMICS

Complete the following assignment in the economics notebook

1. Giving reasons explain how the following are treated while estimating national income:
 - a) Payment of fees to a lawyer engaged by a firm
 - b) Rent free house to an employee by an employer.
 - c) Purchases by foreign tourists.
 - d) Wheat grown by a farmer but used entirely for family's consumption.
 - e) Earnings of the shareholders from the sale of shares.
 - f) Expenditure by government on providing free education.
 - g) Salaries received by Indian residents working in Russian Embassy in India.
 - h) Profits earned by an Indian banks from its branches abroad
 - i) Entertainment tax received by the government.
 - j) Salaries paid to Russians working in Indian embassy in Russia.
 - k) Capital gains to Indian residents from sale of shares of a foreign company.
 - l) Imputed rent of self occupied houses.
 - m) Interest received on debentures
 - n) Financial help received by flood victims.
 - o) Dividend received by a family in India from relatives working abroad.
 - p) Interest received on loans given to a friend for purchasing a car.
 - q) Dividend received by a foreigner from investment in shares of an Indian company.
 - r) Profits earned by a branch of an Indian bank in Canada.
 - s) Scholarships given to an Indian student studying in INDIA by a foreign company.
 - t) Family members working free on the farm owned by the family.
 - u) Payment of interest on borrowings by general government.
 - v) Subsidy on the output produced
 - w) Contribution to provident fund by the employees
 - x) Expenditure on fertilizers by a farmer
 - y) Purchase of tractor by a farmer.
2. Explain the circular flow of income.
3. Distinguish between final and intermediate goods. Give examples.
4. How will you treat the following while estimating domestic factor income of India? Give reasons.
 - a) Remittances from non-resident Indians to their families in India.
 - b) Rent paid by the embassy of Japan in India to a resident Indian.



- c) Profits earned by branches of foreign bank in India.
5. Calculate gross national product at factor cost from the following data by
- Income method
 - Expenditure method

i)	Private final consumption expenditure	1000
ii)	Net domestic capital formation	200
iii)	Profits	400
iv)	Compensation of employees	800
v)	Rent	250
vi)	Government final consumption expenditure	
	500	
vii)	Consumption of fixed capital	60
viii)	Interest	150
ix)	Net current transfers from ROW	- 80
x)	Net factor income from abroad	- 10
xi)	Net exports	- 20
xii)	Net indirect taxes	80
6. Give the meaning of factor income to abroad and factor income from abroad. Also give an example.
7. Distinguish between domestic product and national product. When can domestic product be more than national income?
8. From the following data calculate national income by a) income method b) expenditure method.
- | | | |
|-------|--|------|
| i) | Interest | 150 |
| ii) | Rent | 250 |
| iii) | Government final consumption expenditure | 600 |
| iv) | Private final consumption expenditure | 1200 |
| v) | Profits | 640 |
| vi) | Compensation of employees | 1000 |
| vii) | Net factor income to abroad | 30 |
| viii) | Net indirect taxes | 60 |
| ix) | Net exports | - 40 |
| x) | Consumption of fixed capital | 50 |
| xi) | Net domestic capital formation | 340 |
9. Explain how distribution of GDP is its limitation as a measure of economic welfare.



10. Explain the basis of classifying goods into intermediate and final goods. Give suitable examples

11. From the following data, calculate a) GDP at FC b) Factor income to abroad

12. Distinguish between real and nominal GDP.

13. Distinguish between consumer and capital goods. Which of these are final goods?

14. Explain the problem of double counting in estimating National income with the help of an example also explain two alternative ways of avoiding this problem.

15. Explain why subsidies are added to and indirect taxes deducted from domestic product at market price to arrive at domestic product at factor cost.

16. Explain how the following are treated in estimating national income by income method

- a. Interest on a car loan paid by an individual
- b. Interest on a car loan paid by a government owned company
- c. Interest paid by banks of depositors
- d. National debt interest

17. Classify the following into intermediate products and final goods. Give reasons

- a. furniture purchased by a school
- b. chalks, dusters, etc. purchased by a school
- c. computers installed in an office
- d. Mobile sets purchased by a mobile dealer.
- e. Purchase of furniture by a firm
- f. Expenditure on maintenance by a firm

18. Explain how externalities are a limitation on taking gross domestic product as an index of welfare.

19. Categorize the following into stocks and flows. Give reasons

- a) losses
- b) capital
- c) production
- d) wealth
- e) savings



f) GDP

20. How distribution of income be a limitation of using GDP as index of welfare? Explain.

PHYSICAL EDUCATION

Complete the following reports in the Record File

1. Write benefits of Yoga asanas (10), Swiss ball and Ply metric.
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, Kho Kho 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!