Excellence has No Limits

SACHDEVA GLOBAL SCHOOL

CLASS - XII	SUMMER HOLIDAY HOMEWORK

ENGLISH

Q1. Write a Book Review in a file/folder on "The Invisible Man" by HG Wells, as per the format given below:

S. No.	CONTENT
1	Summary and analysis
2	Character sketch- 5 Main characters
3	Evaluation of Plot and structure
4	Conclusion

MATHS

Complete the following assignment in Maths notebook

1. If $\tan^{-1}1 + \tan^{-1}(1/2) = \tan^{-1}\alpha$, find α.
2. Let f : R – { - 4/3} → R be a function defined as f(x) = 4x / 3x+4. Find the inverse of f.
3. Evaluate Sin [π– $\sin^{-1}$ (-1)].
4. Prove that $\cos^2(\tan^{-1}2)+\sin^2(\cot^{-1}3) = 3/10$.
5. If a binary operation * is defined on the set Z of integers as a*b = 3a –b, then find the value of (2*3)*4.
6. Find the principal value of $\tan^{-1}[\sin(\sin^{-1}x+\cos^{-1}x)]$, x ε [-1,1] .
7. Evaluate sin{ 1/2 $\cos^{-1}(4/5)$ }.
8. If : R → R ,a,b,c,d ϵ R such that (a,b) *(c,d) = (ac, b + ad) Find the identity element of the function.
9. Evaluate : Cos (π/3- $\sin^{-1}(-\sqrt{3}/2)$).
10. Show that the function f: R → R such that $f(x) = x^2$ is neither one –one nor onto.
11. If $f(x) = e^x$ and $g(x) = \log_e x$, find fog and gof. Is fog = gof ?

12. Prove that: $4\tan^{-1}\frac{1}{5}-\tan^{-1}\frac{1}{70}+\tan^{-1}\frac{1}{99}=\frac{\pi}{4}$

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

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

15. Prove that the function f: R $\rightarrow$R defined as f(x) = 2x-3 is invertible and find $f^{-1}(x)$

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

17. Show that the relation are in the set a = {x : x ϵ w, x ≤10}given by

    $R=\{(a,b):|a-b| \text{ is a multiple of } 3\}$ is an equivalence relation , find the elements related to 3.

18. Examine if the following are binary operations

    (i) a*b =a+b/2,a,b ϵ N

    (ii) a*b=a+b/2, a,b ϵ Q .

19. Prove that

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

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

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

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

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

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

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

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

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

28. 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.

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

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

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

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

33. 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'

34. 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.

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

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

36. 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)$(ii)\begin{vmatrix} a & b & c+\beta \\ a & b+\beta & c \\ a+\beta & b & c \end{vmatrix} = \beta^2(a+b+c+\beta)$

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

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

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

ACCOUNTANCY

Complete the following assignment and submit in accountancy notebook.

1. Triphati and Chauhan are partners in a firm sharing profits and losses in the ratio of 3:2. Their capitals were Rs.60,000 and Rs.40,000 as on January 01, 2005. During the year they earned a profit of Rs. 30,000. According to the partnership deed both the partners are entitled to Rs. 1,000 per month as Salary and 5% interest on their capital. They are also to be charged an interest of 5% on their drawings, irrespective of the period, which is Rs. 12,000 for Tripathi, Rs. 8,000 for Chauhan. Prepare Partner's Accounts when, capitalsare fixed.

2. Anubha and Kajal are partners of a firm sharing profits and losses in the ratio of 2:1. Their capital, were Rs.90,000 and Rs.60,000. The profit during the year wereRs. 45,000. According to partnership deed, both partners are allowed salary, Rs. 700 per month to Anubha and Rs. 500 per month to Kajal. Interest allowed on capital @ 5%p.a. The drawings at the end of the period were Rs. 8,500 for Anubha and Rs. 6,500 for Kajal. Interest is to be charged @ 5% p.a. on drawings. Prepare partners' capital accounts, assuming that the capital accountare fluctuating.

3. Ramesh and Suresh were partners in a firm sharing profits in the ratio of their capitals contributed on commencement of business which were Rs. 80,000 and Rs. 60,000 respectively. The firm started business on April 1, 2005. According to the partnership agreement, interest on capital and drawings are 12% and 10% p.a., respectively. Ramesh and Suresh are to get a monthly salary of Rs. 2,000 and Rs. 3,000, respectively.
   The profits for year ended March 31, 2006 before making above appropriations was Rs. 1,00,300. The drawings of Ramesh and Suresh were Rs. 40,000 and Rs. 50,000, respectively. Interest on drawings amounted to Rs. 2,000 for Ramesh and Rs. 2,500 for Suresh. Prepare Profit and Loss Appropriation Account and partners' capital accounts, assuming that their capitals are fluctuating.

4. Arun, Boby and Chintu are partners in a firm sharing profit in the ratio or 2:2:1. According to the terms of the partnership agreement, Chintu has to get a minimum of Rs. 60,000, irrespective of the profits of the firm. Any Deficiency to Chintu on Account of such guarantee shall be borne by Arun. Prepare the profit and loss appropriation account showing distribution of profits among partners in case the profits for year 2006 are: (i) Rs. 2,50,000; (ii) 3,60,000.

5. Mohan, Vijay and Anil are partners, the balance on their capital accounts being Rs. 30,000, Rs. 25,000 and Rs. 20,000 respectively. In arriving at these figures, the profits for the year ended March 31, 2007 amounting to Rupees 24,000 had been credited to partners in the proportion in

which they shared profits. During the tear their drawings for Mohan, Vijay and Anil were Rs. 5,000, Rs. 4,000 and Rs. 3,000, respectively. Subsequently, the following omissions were noticed:

(a) Interest on Capital, at the rate of 10% p.a., was not charged.

(b) Interest on Drawings: Mohan Rs. 250, Vijay Rs. 200, Anil Rs. 150 was not recorded in the books.

Record necessary corrections through journal entries.

6. X and Y are partners sharing profits in 5:3 ratio admitted Z for 1/10 share which he acquired equally for X and Y. Calculate new profit sharing ratio?

7. Radha and Rukmani are partners in a firm sharing profits in 3:2 ratio. They admitted Gopi as a new partner. Radha surrendered 1/3 of her share in favour of Gopi and Rukmani surrendered 1/4 of her share in favour of Gopi. Calculate new profit sharing ratio?

8. The books of Ram and Bharat showed that the capital employed on 31.12.2002 was Rs. 5,00,000 and the profits for the last 5 years : 2002 Rs. 40,000; 2003 Rs. 50,000; 2004 Rs. 55,000; 2005 Rs. 70,000 and 2006 Rs. 85,000. Calculate the value of goodwill on the basis of 3 years purchase of the average super profits of the last 5 years assuming that the normal rate of return is 10%?

9. A and B are partners in a firm sharing profits and losses in the ratio of 3:2. They decide to admit C into partnership with 1/4 share in profits. C will bring in Rs. 30,000 for capital and the requisite amount of goodwill premium in cash. The goodwill of the firm is valued at Rs, 20,000. The new profit sharing ratio is 2:1:1. A and B withdraw their share of goodwill. Give necessary journal entries?

10. Rajesh and Mukesh are equal partners in a firm. They admit Hari into partnership and the new profit sharing ratio between Rajesh, Mukesh and Hari is 4:3:2. On Hari's admission goodwill of the firm is valued at Rs. 36,000. Hari is unable to bring his share of goodwill premium in cash. Rajesh, Mukesh and Hari decided not to show goodwill in their balance sheet. Record necessary journal entries for the treatment of goodwill on Hari's admission.

11. Given below is the Balance Sheet of A and B, who are carrying on partnership business on 31.12.2006. A and B share profits and losses in the ratio of 2:1.

Balance Sheet of A and B as on December 31, 2006

Liabilites	Amount	Assets	Amount
Bills Payable	10,000	Cash in Hand	10,000
Creditors	58,000	Cash at Bank	40,000
Outstanding Expenses	2,000	Sundry Debtors	60,000
		Stock 40,000	
Capitals:		Plant	1,00,000
A 1,80,000		Buildings	1,50,000
B 1,50,000	3,30,000		
	4,00,000		4,00,000

C is admitted as a partner on the date of the balance sheet on the following terms:
(i) C will bring in Rs. 1,00,000 as his capital and Rs. 60,000 as his share of goodwill for 1/4 share in the profits.
(ii) Plant is to be appreciated to Rs. 1,20,000 and the value of buildings is to be appreciated by 10%.
(iii) Stock is found over valued by Rs. 4,000.
(iv) A provision for bad and doubtful debts is to be created at 5% of debtors.
(v) Creditors were unrecorded to the extent of Rs. 1,000.
Pass the necessary journal entries, prepare the revaluation account and partners' capital accounts, and show the Balance Sheet after the admission of C.

Each student to prepare and submit his/her allotted project report.

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

1. The total length of the project will be of 25 to 30 pages.
2. The project should be handwritten.
3. The project should be presented in a neat folder.
4. The project report should be developed in the following sequence-

- Cover page should include the title of the Project, student information, school and year.
- List of contents.
- Acknowledgements and preface (acknowledging the institution, the places visited and the persons who have helped).
- Introduction.
- Topic with suitable heading.
- Planning and activities done during the project, if any.
- Analysis, interpretation and presentation of information.
- Conclusions (summarized suggestions or findings, future scope of study).
- Appendix.

BUSINESS STUDIES

I **Each student to prepare and submit his/her allotted project report.**

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

1. The total length of the project will be of 25 to 30 pages.
2. The project should be handwritten.
3. The project should be presented in a neat folder.
4. The project report should be developed in the following sequence-

- Cover page should include the title of the Project, student information, school and year.
- List of contents.
- Acknowledgements and preface (acknowledging the institution, the places visited and the persons who have helped).
- Introduction.
- Topic with suitable heading.

- Planning and activities done during the project, if any.
- Observations and findings of the visit.
- Conclusions (summarised suggestions or findings, future scope of study).
- Photographs (if any).
- Appendix.

ECONOMICS

TEST – 1

TOPIC- INTRODUCTION

1. State whether the following statements are true or false. Give reasons. (1X5=5)
   a) A free medicine given to the patients in hospitals is not a scarce commodity.
   b) Choice between "production for poor" and production for the rich" refers to the problem of what to produce.
   c) When output of Good1 increases from 100 units to 110 units and output of Good 2 decreases from 400 units to 350 units, marginal opportunity cost = 50 units.
   d) If an economy is operating inside the PPC, it is possible to increase the production of Good 1 without any decrease in production of Good2.
2. When PPC be a straight line? (1)
3. What is slope of PPC? What does it show? (3)
4. Do all attainable combinations point to the same level of output? (3)
5. How is production possibility frontier affected when resources are inefficiently employed in an economy? (3)
6. Draw a transformation curve, given the following possibilities of production (resources and technology remaining constant). Also, find the MOC when more and more guns are produced in place of bread. (4)

Guns(units)	0	1	2	3	4	5
Bread(units)	30	28	24	18	10	0

7. Assuming that no resources are equally efficient in production of all goods, name the curve which shows production potential of the economy. Explain give reasons, its properties. (6)

TEST 2

TOPIC- CONSUMER EQUILIBRIUM.

1. Give an equation of budget line (1)
2. What is meant by monotonic preferences? (1)
3. What is budget set? When it can shift to right? (2)
4. Suppose a consumer can afford to buy 6 units of Good 1 and 8 units of Good2, if she spends entire income. The prices of the two goods are Rs, 6 and Rs. 8 respectively. How much is consumer's income? (1)
5. A consumer consumes only two goods X and Y. If marginal utilities of X and Y are 4 and 5 respectively, and if price of X is Rs. 5 per unit and that of Y is Rs 4 per unit, is the consumer in equilibrium? What will be further reaction of the consumer? (3)
6. Explain the conditions of consumer's equilibrium using indifference curve analysis. (6)
7. Define indifference curve. Explain the properties (6)

TEST 3

TOPIC- DEMAND THEORY & ELASTICITY OF DEMAND

1. When does "increase in demand" take place?
2. Explain how fall in price of related goods influence demand for a good. Use diagram
3. Mention the reason for rightward shift in demand curve.
4. What is market demand? Explain the factors determining market demand.
5. Explain law of demand with the help of demand schedule.
6. Law of demand derived from law of diminishing marginal utility. Explain how. Give an illustration using single commodity equilibrium condition.
7. What is the relation between Good X and Good Y, if
8. Explain the distinction between "change in quantity demanded" and change in demand. Use diagrams.
9. Explain the effects of change in income on demand for a good. Use diagram
10. Price elasticity of demand of good X is -2 and of good Y is -3. Which of the two goods is more price elastic and why?
11. When price of a good is Rs. 7 per unit a consumer buys 12 units. When price falls to Rs.6 per unit he spends Rs. 72 on the good. Calculate price elasticity of demand by using the percentage method. Comment on the likely shape of demand curve based on this measure of elasticity.
12. A consumer buys 10 units of a good at a price of Rs. 9 per unit. At price of Rs. 10 per unit he buys 9 units. What is price elasticity of demand? Use expenditure approach comment on the likely shape of demand curve on the basis of this measure of elasticity.

13. A consumer buys 20 units of a good at a price of Rs. 5 per unit. He is incurs an expenditure of Rs. 120 when he buys 24 units. Calculate price elasticity of demand of the percentage method. Comment on the likely shape of demand curve based on this information.
14. Price elasticity of good X is known to be thrice that of Good Y. If price of the Good X increases by 20% and price of the good Y decreases by 40% then calculate percentage charges in demand in both the cases.
15. The price elasticity of demand for good X and Y are known to be 1 and 2 respectively. Price of X arises by 5% while that of good Y falls by 5%. What are the percentage changes in the quantities demands of X and Y.
16. The price elasticity of good X or Y are equal. The demand of X rises from 100 units to 150 units due to a 20 percent fall in its price. Calculate the percentage rise in demand of Y, it its price falls by 8 percentages.

NOTE:

a) Complete all tests in a separate register.
b) Practice all numerical of Nation Income and Accounting.

PHYSICAL EDUCATION

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!