

ENGLISH LITERATURE

THE TEMPEST

QUESTIONS TO BE ATTEMPTED

1. 'THE TEMPEST' IS PURELY A ROMANTIC DRAMA. Comment on the given statement and list out the reasons why it is not a comedy or a tragedy.
2. Do you consider the play as a tragicomedy? Give reasons for your answer.
3. Comment on the handling of the theme of power in the play.
4. Critically examine the theme of forgiveness in the play.
5. 'The Tempest' shows us that there are some natures which cannot be improved by nurture. Discuss.

Act 4 Scene 1

Summary

This scene begins with Prospero acknowledging that he has only been testing Ferdinand and Miranda's love. Now that he knows Ferdinand really loves his daughter, he is willing to bless the wedding. But he severely warns Ferdinand against taking Miranda's virginity before the wedding and promises "barren hate, sour-eyed disdain, and discord" if he doesn't respect Prospero's wishes.

To celebrate the engagement and to show his powers, Prospero instructs Ariel to go and bring spirit actors to perform a masque. Iris, Ceres, Jupiter, Venus, Mars, Hymen, and Juno all feature in this dramatic production that honours the contract of marriage. Ferdinand, amazed by Prospero's powers that can call forth such spirits at his bidding, longs to stay on the island and live with Prospero as his father and Miranda as his wife. But Prospero suddenly stops the dancing when he remembers Caliban and his companions plan to kill him and the time is fast approaching. He disperses the spirits and comforts the disappointed Ferdinand by reminding him that everything eventually comes to an end.

*Our revels now are ended. These our actors,  
As I foretold you, were all spirits, and  
Are melted into air, into thin air;  
And like the baseless fabric of this vision,  
The cloud-capped towers, the gorgeous palaces,  
The solemn temples, the great globe itself,  
Yea, all which it inherit, shall dissolve;  
And, like this insubstantial pageant faded,  
Leave not a rack behind. We are such stuff  
As dreams are made on, and our little life*

*Is rounded with a sleep. Sir, I am vexed.  
Bear with my weakness. My old brain is troubled.*

With his troubled mind, Prospero sends Ferdinand and Miranda away so that he can come up with a plan.

Ariel enters and together the two discuss how best to handle "Caliban and his confederates." Ariel recalls what has already been done to the men. Using music as a lure, Ariel has brought them on an uncomfortable path through "toothed briars, sharp furzes, pricking gorse, and thorns" and then left them in a filthy, stinking pool of water near Prospero's cell. Prospero sends Ariel off to gather some glittery apparel. Meanwhile Prospero laments the devilish nature of Caliban, which cannot be broken or corrected even with the humane treatment Prospero initially offered him.

When Ariel returns they hang the fancy garments on a line near Prospero's cell. When the men enter, soaking wet from the filthy pond, they are complaining and arguing. Caliban tries to keep them focused on the matter at hand: murdering Prospero. But the men become distracted by the beautiful clothing, claiming it for "King Stephano" as Caliban becomes more and more upset that they need to "do the murder first," but the men will have none of it as they try on all the clothes. In the midst of this chaos Prospero sends spirits in the shape of hunting dogs upon the three men to drive them off.

Now Prospero recognizes that everything he has been working toward is suddenly within his control: "At this hour/Lie at my mercy all mine enemies." He only has to finish his plans and he can free Ariel.

## **Analysis**

The subject of marriage is central to this scene, which begins with Prospero's assent to his daughter's marriage to Ferdinand and moves into the lengthy masque. Particularly at the time of the play's writing, marriage was an institution that symbolized order and structure in society. In fact, many marriages were founded on reasons other than love because the social contract between two families offered economic or political power for one or both parties.

Ferdinand and Prospero discuss Miranda's virginity and the sexual pleasures of marriage. Modern audience members might extend the theme of exploitation and power to this relationship, particularly as it was written at a time when women had few rights and a wife was considered a possession of her husband. Miranda is passed from one "owner," Prospero, to another, Ferdinand, as Prospero says, "Then as my gift and thine own acquisition/Worthily purchased, take my daughter." However, it is unlikely Shakespeare was pointing to Miranda and Ferdinand's marriage as an additional type of exploitation since their marriage is a key ingredient and source of harmony in the happy ending of the play.

Prospero's repeated admonitions to Ferdinand not to give into his passions before the wedding support the ideal of romantic love, which asserts love is a pure, holy, and honourable condition. At the same time Prospero recognizes the strength of human passion, whereby "The strongest oaths are straw/To th' fire i' th' blood." Shakespeare, through Prospero, acknowledges two powerful, sometimes opposing, forces in human nature: passion and reason. Prospero's insistence that Ferdinand and Miranda undergo the full ceremony of legitimate marriage likewise shows a concern about legitimacy and formality. Despite the fact that Ferdinand has pledged his love and fidelity and technically now has a legal obligation to Miranda, Prospero wants to ensure that Miranda's future is secure.

Prospero commands a masque to be performed to celebrate the betrothal of Ferdinand and Miranda. In the 17th century a masque was an elaborate theatrical production that included costumes, actors, singing, and dancing. The characters and plots were based on story lines from Greek and Roman mythology. In the masque in *The Tempest*, the goddesses in the masque symbolize fertility and prosperity within family and nature. This scene provides more insight into the humanity of Prospero's character. Despite the murderous nature of Caliban, Stephano, and Trinculo's plot against Prospero, he does not severely punish them. Instead he uses magic to scare them and run them off, so that they do not try to kill him again. Prospero wishes to right wrongs, not create new ones. At the same time Ariel's devotion and Prospero's commitment to freeing Ariel are underscored. In fact there is a true, shared affection between the two, as Ariel asks, "Do you love me, master?" and Prospero responds, "Dearly, my delicate Ariel." Prospero, who has recently been engaged with his many plans and the masque itself, stops suddenly because he has to solve a new problem. He acknowledges he is getting old and in describing the end of the masque makes clear comparisons to life itself. All the artifice of the masque is like the artifice of life, which, like a play, eventually fades. Our human lives are like short dreams that are surrounded by sleep. Many scholars view Prospero's speech here as Shakespeare's personal farewell to the theatre, where his own plays and pageants "now are ended."

Prospero says at the end of the scene that "At this hour/Lies at my mercy all mine enemies," but his confession to Ferdinand a few minutes earlier that "my old brain is troubled" makes it seem like he does not find the successful completion of his revenge plan as satisfying as he had anticipated.

---

**CH -4 RETIREMENT OF A PARTNER****Theory in form of Questions and Answers:****Q – 1: What do you mean by Retirement of a Partner?**

**Ans-1:** When a partner ceases to be a partner of the firm (other than because of death), it is known as Retirement of a Partner.

**Q – 2: Discuss the situations under which a partner can retire from a firm?**

**Ans-2:** A partner may retire from the firm:

- i. If there is an agreement to that effect, or
- ii. If all the partners agree to his/her retirement, or
- iii. If the partnership is at will, by giving notice in writing to other partners of his or her intention to retire.

**This leads to reconstitution of the firm.**

**Q – 3: What is Gaining Ratio?**

**(ISC 2007)**

**Ans-3:** Ratio in which the continuing or remaining partners acquire retiring partner's share is called Gaining Ratio.

$$\text{Gaining Ratio} = \text{New Ratio} - \text{Old Ratio}$$

**Q – 4: What is New Profit-Sharing Ratio?**

**Ans-4:** Ratio in which continuing or remaining partners (partners other than retiring partner) decide to share future profits and losses, is known as New Profit-Sharing Ratio.

$$\text{New Ratio} = \text{Old Ratio} + \text{Gaining Ratio}$$

**Q – 5: When is a partner liable for debts incurred by the firm after his retirement?  
(ISC 2007)**

**Ans-5:** A partner is liable for debt incurred by the firm after his retirement if the public notice is not given regarding his retirement. In such case the retiring partner continues to be a liable partner to third parties for any act done by the remaining partners.

taruna@stxaviers.com

**Q – 6: How is goodwill adjusted in the books of a firm when a partner retires from partnership?**

**Ans-6: Accounting Treatment of Goodwill:** According to **Accounting Standard - 26** Goodwill is recorded in the books of accounts only when consideration in money or

money's worth has been paid for it. That means only purchased goodwill is recorded in the books. Therefore, at the time of retirement **Goodwill Account cannot be raised** in the books of the firm. Goodwill is adjusted by taking following steps:

**Step – 1:** Write off existing goodwill (if any) appearing in the Balance Sheet by passing the following entry:

<b>All Partners' Capital A/cs</b>	<b>...Dr</b>	<b>(In old ratio)</b>
<b>To Goodwill A/c</b>		<b>(With existing book value of goodwill)</b>
<b>(Being the existing goodwill written off in old ratio)</b>		

**Step – 2:** Value goodwill of the firm and find out retiring partner's share and pass following entry:

<b>Gaining Partners' Capital A/cs</b>	<b>...Dr</b>	<b>(In gaining ratio)</b>
<b>To Retiring Partner's Capital A/c</b>		<b>(With his share of goodwill)</b>
<b>(Being the adjustment made for goodwill on retirement)</b>		

[taruna@stxaviers.com](mailto:taruna@stxaviers.com)

**Q – 7: Give two differences between Sacrificing Ratio and Gaining Ratio.**

**(ISC 2012)**

**Ans-7:**

<b>Sacrificing Ratio</b>	<b>Gaining Ratio</b>
<b>1.</b> It is calculated at the time of admission of a partner.	It is calculated at the time of retirement or death of a partner.
<b>2.</b> It is the ratio in which the old partners make a sacrifice or surrender a part of their share towards incoming partner.	It is the ratio in which the remaining partners gain out of the share of a retiring or deceased partner.
<b>3.</b> New partner's share of goodwill is divided between the old partners in sacrificing ratio.	Goodwill paid to retiring partner is paid by the remaining partners in their gaining ratio.
<b>4.</b> <b>Sacrificing Ratio =</b> <b>Old Ratio – New Ratio</b>	<b>Gaining Ratio =</b> <b>New Ratio – Old Ratio</b>

[taruna@stxaviers.com](mailto:taruna@stxaviers.com)

**Q -8: Why is it necessary to distribute accumulated reserves, profits, and losses at the time of retirement of a partner?**

**Ans-8:** At the time of retirement of a partner if reserves and accumulated profits and losses exist in the books of the firm, these should be transferred to the Capital Accounts (or Current Accounts if capital is fixed) of all the partners (including retiring partner) in

their profit-sharing ratio so that retiring partner's due share is adjusted in his Capital Account/Current Account by passing this entry:

**1. For distributing Reserves and Accumulated Profits:**

General Reserves A/c	...Dr	
Profit & Loss A/c (Cr balance)	...Dr	
Investment Fluctuation Reserve A/c	...Dr	[Excess of Reserve over Difference between Book value And Market value]

Workmen Compensation Reserve A/c	...Dr	[Excess of Reserve over Liability]
	To Partners' Capital A/cs	[In Old Profit-Sharing Ratio]

**2. For writing off Accumulated Losses:**

Partners' Capital A/cs	...Dr	[In Old Profit-Sharing Ratio]
	To Profit & Loss A/c (Dr Balance)	
	To Advertisement Suspense A/c	[Deferred Revenue Exp.]

**Q – 9: How will the firm show the amount payable to the retiring partner, if it is not able to immediately pay the amount due to him on his retirement? (ISC 2013)**

**Ans-9:** If the firm is not able to immediately pay the amount due to retiring partner, the unpaid amount is transferred to his Loan Account, thereby closing his Capital Account.

<b>Retiring Partner's Capital A/c</b>	<b>...Dr</b>
	<b>To Retiring Partner's Loan A/c</b>

Retiring Partner's Loan A/c appears as a Liability in subsequent Balance Sheet until paid.  
taruna@stxaviers.com

**Q – 10: State the ratio in which profit/loss on revaluation will be shared by the partners when a partner retires.**

**Ans-10:** When a partner retires, any profit or loss on revaluation of assets and reassessment of liabilities **will be shared by all the partners** (including retiring partner) in their **old profit-sharing ratio**.

\*\*\*\*\*

**Consumer Protection Chapter 15**

- **Consumer**
- **Consumer protection**
- **Need for consumer protection**
- **Rights of consumers**

Human being by birth is a consumer. He needs clothes, milk, oil, soap, water, diapers and many more things in the initial years and these needs keep on changing and taking one form or the other, all along the life of an individual. Thus, we all the consumers in literal sense of the term throughout our life.

**Consumer:** As per Consumer Protection Act; a person is called a consumer who avails the services and buys goods for self-use. **Worth to mention that if a person buys any good and avail any services for resale or commercial purpose, is not considered a consumer.** This definition covers all types of transactions i.e. **online** and **offline**.

**Consumer protection** is the practice of safeguarding the interest of consumers. Consumer protection measures are often established by law. Such laws are intended to prevent businesses from engaging in fraud ,unfair trade practices in order to gain an advantage over competitors or to mislead consumers.

In modern philosophy of marketing **a consumer is supposed to be the king** and business should provide maximum possible satisfaction to the consumer. But in reality consumers are exploited, harassed or cheated by unscrupulous suppliers, who adopted unfair trade practices like defective and unsafe products, adulteration, false and misleading

advertisement, hoarding & black marketing etc.



### **Need for consumer protection**

A consumer is considered a king in the modern marketing concept. The earlier approach “let the buyer beware” has now been replaced by “let the seller beware”. Protection of consumer is necessary due to following reasons:

1. **Consumer ignorance:** Due to high illiteracy and low level of education, many consumers are likely to be cheated as they are not able to read information printed on the label of the product. Consumer protection is needed to create awareness among consumers about their rights and responsibilities by organising workshops/seminars and give them confidence to take legal action against unfair trade practices.
2. **Unorganized consumers:** In India, consumers are not yet united in the form of consumer association/organisation which could protect their interest. Consumer protection aims at organizing consumers as a group and then bringing unity among them to fight collectively against those who are involved in unfair trade practices.
3. **Service motive:** The sole objective of business is not profit earning. Any business can flourish only when it serves its customer well. To serve well to satisfy and retain its customers, business must provide goods and services of right quality and quantity and a right price. Hence service motive of business will not only protect the consumers but also form the basis for the success of any business.’
4. **Consumer is the king:** The main aim of any business is to create and satisfy its consumers. In order to satisfy the consumers, the business must provide good



quality goods and services. It is through consumer satisfaction that a business can earn profit and continue its operations in the long run.

### **Consumers` Protection Act, 1986**

The Consumer Protection Act 1986 was passed to promote and protect the right of consumers. It seeks to provide a speedy and simple redressal to consumer grievances. The Consumer Protection Act has specified consumer rights.

The Consumer Protection Act 1986 was replaced with Consumer Protection Act 2019. This act was inevitable to resolve a large number of pending consumer complaints in consumer courts across the country. It has ways and means to solve the consumer grievances speedily.

### **Rights of consumers as per “Consumer Protection Act 1986**

1. **Right to safety:** The Consumer Protection Act 1986 defines this right as a protection against goods and services that are “hazardous to life and property”. This particularly applies to medicines, foodstuff and automobiles etc. Products should not cause any physical danger to consumers or put them into any difficulty. Consumers must have assurance regarding quality, reliability and performance. For safety consumers must prefer to buy electrical appliances with “ISI”, agricultural product with “AGMARK”, food products with “FPO” marking etc.
2. **Right to information:** This right mentions the need for the consumers to get complete information relating to the product and its marketer which he intends to buy. The information sought should include ingredients used, quantity, quality, price, direction for use, date of manufacturing, date of expiry, if applicable, precautions if applicable, name and address of manufacturer. The manufacturer is legally required to furnish above information on the package and label of the product in the language used in the country
3. **Right to choose:** Under Consumer Protection Act, the consumer is given the right/freedom to choose and purchase the product from the available alternatives. There should be open competition in the market. The seller should not force the consumers to buy a particular product.
4. **Right to be heard:** When a consumer feels exploited, he/she has the right to approach a consumer court to file complaint and seek justice. There are consumer courts at district, state and national level for redressal of disputes. The enlightened business houses prefer to set up their own consumer service and

grievance cell to help consumer in resolving their complaints and grievances at the initial stage itself.

5. **Right to seek redressal:** According to Consumer Protection Act, the consumer has the right to get compensation or seek redressal against unfair trade practices or any other exploitative activities of marketer. The right to seek redressal provides the following reliefs to consumers.
  - ✓ Replacement of product
  - ✓ Remove of defect in the product
  - ✓ Repair of product
  - ✓ Compensation paid for any loss or injury suffered by the consumer.

The right to seek redressal will reduce post-purchase doubts and grievances of costumers.

6. **Right to Consumer Education:** As per Consumer Protection Act the consumer has right to acquire knowledge and to be will informed while making consumption decisions. This will help them to decide what to purchase, how much to purchase, and at what price. For an educated consumer to know their rights and take action. For illiterate and ignorant consumers, government through various ways like radio, T.V. educate them about their rights, responsibilities, and remedies available to them against unfair and exploitative trade practices.
7. **Right to Healthy Environment:** Consumers have right to be protected against environment pollution so that the quality of life is enhanced. Not only this, it also stresses on the need to protect the environment for the future generation as well.

**In addition to the existing SIX consumer rights, there are FIVE new consumer rights you get as a consumer from Consumer Protection Act, 2019.**

1. **Right to file a complaint from anywhere:** According to this new right, consumers can now file a complaint with the District Consumer Commission or State Consumer Commission from anywhere, home, office or while on a weekend trip. Presently, the consumers are required to file a case only at the place where the product was purchased or where the seller of the product has his registered office. The consumer affairs ministry will now frame rules for electronic filing of complaints and specify norms for paying the required fee digitally. This will reduce harassment of consumers to a great extent.

2. **Right to seek compensation under product liability:** Any complainant can file a case against the manufacturer or seller of a product for any loss caused to the complainant on account of a defective product, which applies to all services. If there is a manufacturing defect or the product in question does not conform to the express warranty the manufacturer or the seller will be held liable. This provision brings e-commerce under its ambit.
3. **Right to protect consumers as a class:** If you have a complaint that relates to violation of consumer rights or unfair trade practices or misleading advertisements that are prejudicial to the interests of consumers as a class, you can do two things. Forward the complaint in writing or in electronic mode to district collector or the commissioner of regional office or the Central Consumer Protection Authority (CCPA) for class action.
4. **Right to seek a hearing using video conferencing:** According to this, any complaint will be presented before the district commission based on an affidavit and documentary evidence placed before it. If an application has been forwarded by a consumer for hearing through video conference, the commission can allow for this provision.
5. **Right to know why a complaint was rejected:** No commission can reject a complaint without hearing the complainant. The commission, in fact, must decide about admitting or rejecting a complaint within 21 days, by which if it is not decided then the complaint is deemed as having been admitted.

**Assignment: After understanding thoroughly topic discussed above answer the following question in you Commerce Note Book.**

1. What does a Consumer Need Protection?
  2. Explain various rights of a Consumer as per Consumer Protection Act 1986
  3. Explain the new rights you get as a Consumer as per Consumer Protection Act 2019
- .....

**TOPIC-DEMAND AND LAW OF DEMAND**



**Answer the following questions**

**QUESTION -1.** What do you mean by an individual demand ?

**QUESTION -2**Mention two determinants of demand for a commodity other than its price .

**QUESTION -3.**Define a) substitute goods b) complementary goods .

**QUESTION -4.**How will increase in price of tea affect the demand for  
1)coffee 2) sugar

**QUESTION -5.**How does an increase in income affect the demand for an inferior good.

**QUESTION -6.**What is demand function ?

**QUESTION -7.**If the demand for good Y increases as the price of another good rises ,how are these goods related ?

**QUESTION -8.**What do you mean by-

- a) Demand curve
- b) Demand schedule

**QUESTION -9.**What is the shape of demand curve ?

**QUESTION -10.**What factors influence the demand of the commodity?( Hint-explain all the factors in detail.

\*\*\*\*\*

# INVERSE TRIGONOMETRIC FUNCTIONS

$$\sin^{-1} x + \cos^{-1} x = \frac{\pi}{2}$$

$$\tan^{-1} x + \cot^{-1} x = \frac{\pi}{2}$$

$$\sec^{-1} x + \operatorname{cosec}^{-1} x = \frac{\pi}{2}$$

$$\sin^{-1} x + \sin^{-1} y = \sin^{-1} (x\sqrt{1-y^2} + y\sqrt{1-x^2})$$

$$\sin^{-1} x - \sin^{-1} y = \sin^{-1} (x\sqrt{1-y^2} - y\sqrt{1-x^2})$$

$$\cos^{-1} x + \cos^{-1} y = \cos^{-1} (xy - \sqrt{1-x^2}\sqrt{1-y^2})$$

$$\cos^{-1} x - \cos^{-1} y = \cos^{-1} (xy + \sqrt{1-x^2}\sqrt{1-y^2})$$

$$\tan^{-1} x + \tan^{-1} y = \tan^{-1} \left( \frac{x+y}{1-xy} \right), \text{ if } xy < 1$$

$$= \pi + \tan^{-1} \left( \frac{x+y}{1-xy} \right), \text{ if } xy > 1, x > 0, y > 0$$

$$\tan^{-1} x - \tan^{-1} y = \tan^{-1} \left( \frac{x-y}{1+xy} \right), xy > -1$$

## Also Remember:

$$\text{Since } \sin 2x = \frac{2 \tan x}{1 + \tan^2 x} \text{ therefore}$$

$$2 \tan^{-1} x = \sin^{-1} \frac{2x}{1+x^2}$$

$$\text{Since } \cos 2x = \frac{1 - \tan^2 x}{1 + \tan^2 x} \text{ therefore}$$

$$2 \tan^{-1} x = \cos^{-1} \frac{1-x^2}{1+x^2}$$

$$\text{Since } \tan 2x = \frac{2 \tan x}{1 - \tan^2 x} \text{ therefore}$$

$$2 \tan^{-1} x = \tan^{-1} \frac{2x}{1-x^2}$$

$$\text{Similarly: } 3 \sin^{-1} x = \sin^{-1} (3x - 4x^3), |x| \leq \frac{1}{2}$$

$$3 \cos^{-1} x = \cos^{-1} (4x^3 - 3x), \frac{1}{2} \leq x \leq 1$$

$$3 \tan^{-1} x = \tan^{-1} \left( \frac{3x - x^3}{1 - 3x^2} \right), |x| < \frac{1}{\sqrt{3}}$$

**Illustration 9:** Prove that  $\tan^{-1} 1 + \tan^{-1} 2 + \tan^{-1} 3 = \pi$

**Solution:**

$$\pi + \tan^{-1} \frac{1+2}{1-(1)(2)} + \tan^{-1} 3 = \tan^{-1}(-3) + \tan^{-1} 3$$

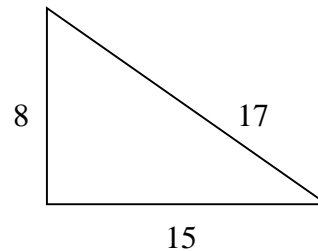
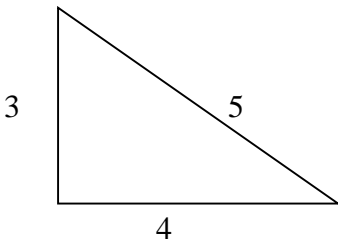
[ Applying  $\tan^{-1}x + \tan^{-1}y$  formula when  $xy > 1$  ]

Again applying the same formula we get,

$$= \pi + \tan^{-1} \frac{-3+3}{1-(-3)(3)} = \pi + \tan^{-1} 0 = \pi$$

**Illustration 10:** Prove that  $\sin^{-1} \frac{3}{5} - \sin^{-1} \frac{8}{17} = \cos^{-1} \frac{84}{85}$

**Solution:** Since the right hand side is in terms of cosine, therefore we will first convert sine inverse into cos inverse.



So  $\sin^{-1} \frac{3}{5} = \cos^{-1} \frac{4}{5}$  and  $\sin^{-1} \frac{8}{17} = \cos^{-1} \frac{15}{17}$

Therefore we get  $\cos^{-1} \frac{4}{5} - \cos^{-1} \frac{15}{17} = \cos^{-1} \left( \frac{4}{5} \times \frac{15}{17} + \sqrt{1 - \frac{225}{289}} \sqrt{1 - \frac{16}{25}} \right)$

$\Rightarrow \cos^{-1} \left\{ \frac{60}{85} + \left( \frac{8}{17} \right) \left( \frac{3}{5} \right) \right\} = \cos^{-1} \left( \frac{84}{85} \right)$

**Illustration 11:** Prove that  $\sin \left( 2 \tan^{-1} \frac{3}{5} - \sin^{-1} \frac{7}{25} \right) = \frac{304}{425}$

**Solution:** Since  $2 \tan^{-1} x = \sin^{-1} \frac{2x}{1+x^2}$ , therefore  $2 \tan^{-1} \frac{3}{5} = \sin^{-1} \left( \frac{\frac{6}{5}}{1 + \frac{9}{25}} \right)$

$= \sin^{-1} \left( \frac{6}{5} \times \frac{25}{34} \right) = \sin^{-1} \left( \frac{15}{17} \right)$

Hence we have  $\sin \left( \sin^{-1} \frac{15}{17} - \sin^{-1} \frac{7}{25} \right) = \sin \left\{ \sin^{-1} \left( \frac{15}{17} \sqrt{1 - \frac{49}{625}} - \frac{7}{25} \sqrt{1 - \frac{225}{289}} \right) \right\}$

$\Rightarrow \sin \left\{ \sin^{-1} \left( \frac{15}{17} \cdot \frac{24}{25} - \frac{7}{25} \cdot \frac{8}{17} \right) \right\} = \sin \left\{ \sin^{-1} \frac{360-56}{425} \right\} = \sin \left\{ \sin^{-1} \frac{304}{425} \right\} = \frac{304}{425}$

**SOLVE YOURSELVES:**

1. Prove that  $\tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{13} = \tan^{-1} \frac{2}{9}$

2. Prove that  $\tan^{-1} 1 + \tan^{-1} \frac{1}{2} + \tan^{-1} \frac{1}{3} = \frac{\pi}{2}$

3. Prove that  $2 \tan^{-1} \frac{1}{3} + \cot^{-1} 4 = \tan^{-1} \frac{16}{13}$

[  $\cot^{-1} 4 = \tan^{-1} \frac{1}{4}$  ]

4. Prove that  $\tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$

5. Prove that  $\cos^{-1} \frac{3}{5} + \sin^{-1} \frac{12}{13} = \sin^{-1} \frac{56}{65}$

6. Prove that  $\tan^{-1} \frac{1}{3} + \sec^{-1} \frac{\sqrt{5}}{2} = \frac{\pi}{4}$

7. Prove that  $\sin^{-1} \frac{4}{5} + \cos^{-1} \frac{2}{\sqrt{5}} = \cot^{-1} \frac{2}{11}$

8. Evaluate  $\tan ( 2 \tan^{-1} \frac{1}{2} - \cot^{-1} 3 )$

Ans:  $\frac{9}{13}$

**Illustration 12:** Write the following in simplest form:  $\tan^{-1} \frac{1}{\sqrt{x^2-1}}$

**Solution:** Let  $x = \operatorname{cosec} \theta$ , it means  $\theta = \operatorname{cosec}^{-1} x$

$$\Rightarrow \tan^{-1} \frac{1}{\sqrt{x^2-1}} = \tan^{-1} \frac{1}{\sqrt{\operatorname{cosec}^2 \theta - 1}} = \tan^{-1} \frac{1}{\cot \theta} = \tan^{-1} (\tan \theta) = \theta = \operatorname{cosec}^{-1} x$$

**Illustration 13:** Write  $\tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right)$ ,  $x \neq 0$  in the simplest form.

**Solution:** Let  $x = \tan \theta$ , it means  $\theta = \tan^{-1} x$

$$\Rightarrow \tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) = \tan^{-1} \left( \frac{\sqrt{1+\tan^2 \theta}-1}{\tan \theta} \right) = \tan^{-1} \left( \frac{\sec \theta - 1}{\tan \theta} \right) = \tan^{-1} \left( \frac{\frac{1}{\cos \theta} - 1}{\frac{\sin \theta}{\cos \theta}} \right)$$

$$\Rightarrow \tan^{-1} \left( \frac{1-\cos \theta}{\sin \theta} \right) = \tan^{-1} \left( \frac{2 \sin^2 \theta / 2}{2 \sin \theta / 2 \cos \theta / 2} \right) = \tan^{-1} (\tan \theta / 2) = \theta / 2 = \frac{\tan^{-1} x}{2}$$

**Illustration 14:** Write  $\tan^{-1} \left( \frac{3a^2x-x^3}{a^3-3ax^2} \right)$

**Solution:** As we know that tangent has a characteristic formula, so we divide numerator and denominator by  $a^3$

$$\Rightarrow \tan^{-1} \left( \frac{3 \frac{x}{a} - \left(\frac{x}{a}\right)^3}{1 - 3 \left(\frac{x}{a}\right)^2} \right) \text{ Now we can put } \frac{x}{a} = \tan \theta \text{ or in other words, } \theta = \tan^{-1} \left( \frac{x}{a} \right)$$

$$\Rightarrow \tan^{-1} \left( \frac{3 \tan \theta - \tan^3 \theta}{1 - 3 \tan^2 \theta} \right) = \tan^{-1} (\tan 3\theta) = 3\theta = 3 \tan^{-1} \left( \frac{x}{a} \right)$$

**Illustration 15:** Prove that  $\sin \left[ \tan^{-1} \left( \frac{1-x^2}{2x} \right) + \cos^{-1} \left( \frac{1-x^2}{1+x^2} \right) \right]$

**Solution:** Put  $x = \tan \theta$  or  $\theta = \tan^{-1} x$

$$\Rightarrow \sin \left[ \tan^{-1} \left( \frac{1-\tan^2 \theta}{2 \tan \theta} \right) + \cos^{-1} \left( \frac{1-\tan^2 \theta}{1+\tan^2 \theta} \right) \right] = \sin \left[ \tan^{-1} \frac{1}{\tan 2\theta} + \cos^{-1} (\cos 2\theta) \right]$$

$$\Rightarrow \sin \left[ \tan^{-1} (\cot 2\theta) + 2\theta \right] = \sin \left[ \tan^{-1} \left\{ \tan \left( \frac{\pi}{2} - 2\theta \right) + 2\theta \right\} \right]$$

$$\Rightarrow \sin \left[ \frac{\pi}{2} - 2\theta + 2\theta \right] = \sin \frac{\pi}{2} = 1$$

**Illustration 16:** Prove that  $\tan^{-1} \left[ \frac{\sqrt{1+x} - \sqrt{1-x}}{\sqrt{1+x} + \sqrt{1-x}} \right]$

**Solution:** Put  $x = \cos 2\theta$  [  $\because$  we know  $1 + \cos 2\theta = 2 \cos^2 \theta$  and  $1 - \cos 2\theta = 2 \sin^2 \theta$  ]

$$\therefore 2\theta = \cos^{-1} x \text{ or } \theta = \frac{1}{2} \cos^{-1} x \text{ -----(1)}$$

$$\Rightarrow \tan^{-1} \left[ \frac{\sqrt{2} \cos \theta - \sqrt{2} \sin \theta}{\sqrt{2} \cos \theta + \sqrt{2} \sin \theta} \right] = \tan^{-1} \left[ \frac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} \right]$$

$$= \tan^{-1} \left[ \frac{1 - \tan \theta}{1 + \tan \theta} \right] \quad \text{[Dividing N<sup>r</sup> & D<sup>r</sup> by cosθ]}$$

$$= \tan^{-1} \left[ \tan \left( \frac{\pi}{4} - \theta \right) \right] = \frac{\pi}{4} - \theta = \frac{\pi}{4} - \frac{1}{2} \cos^{-1} x \quad \text{[ using (1) ]}$$

**WRITE THE FOLLOWING IN SIMPLEST FORM:**

9.  $\tan^{-1} \left( \frac{1 - \cos x}{1 + \cos x} \right)$  [Hint: Use  $1 - \cos x = 2 \sin^2 x/2$  and  $1 + \cos x = 2 \cos^2 x/2$ ] Ans:  $\frac{x}{2}$

10.  $\tan^{-1} \left( \frac{2\sqrt{x}}{1-x} \right)$  [ Hint: Put  $x = \tan^2 \theta$  ] Ans:  $2 \tan^{-1} \sqrt{x}$

11.  $\cos^{-1} (1 - 2x^2)$  [Hint: Put  $x = \sin^2 \theta$  ] Ans:  $2 \sin^{-1} x$

12.  $\tan^{-1} \left( \sqrt{\frac{1-x}{1+x}} \right)$  [ Hint: Put  $x = \cos 2\theta$  ] Ans:  $\frac{1}{2} \cos^{-1} x$

13.  $\tan^{-1} \left( \frac{x}{\sqrt{a^2 - x^2}} \right)$  [ Hint: put  $x = a \sin \theta$  ] Ans:  $\sin^{-1} \frac{x}{a}$

14.  $\tan^{-1} \left( \frac{a \cos x - b \sin x}{b \cos x + a \sin x} \right)$  Ans:  $\tan^{-1} \frac{a}{b} - x$

[Hint: Divide N<sup>r</sup> & D<sup>r</sup> by bcosx first and then apply  $\tan^{-1} \frac{x-y}{1+xy} = \tan^{-1} x - \tan^{-1} y$  ]

**MORE QUESTIONS BASED ON PROPERTIES OF INVERSE TRIG. FUNCTIONS CONTD..... IN WORKSHEET-15**



**CHAPTER 3: TOPIC 1: CAREER ASPECTS IN PHYSICAL EDUCATION.**

**INTRODUCTION:** career opportunities in physical education have never been greater. Traditional careers of teaching have expanded from schools, colleges and universities to non-school settings, such as community centres (e.g. YMCA AND YWC) commercial clubs) i.e. tennis, golf, cricket, gymnastics etc.) Many physical educationists are pursuing careers in the physical fitness field, working in health clubs or corporate fitness centers.

During the past 30 years, career aspects in physical education have expanded tremendously. The trend is a result of several factors, such as:

**First**, millions of people from all segments of society engage in physical fitness activities on a regular basis. They participate in a variety of activities, including working out at health and fitness clubs and engaging in community and commercial fitness programmes.

**Secondly**, people seeking to use their leisure time in an enjoyable and constructive manner have sought out physical activities and sport.

**Thirdly**, the increased interest in competitive sports by all segments of the population has served as the impetus for growth of competitive sports programmes, sports clubs, and the leagues or IPLs and the associated career aspects or opportunities in coaching sports management, officiating, and the athletics training.

**Fourthly and finally**, the increase in the depth and breadth of knowledge in physical education has led to the further development of sub-disciplines and expanded career opportunities such as biomechanists, sports psychologists, exercise physiologists, and adapted physical activity specialists.

Keeping in view the requirements of the students of physical education from the examination point of view the career aspects mentioned in the syllabus are mentioned and discussed below:

**Professional sportsmen:** professional players are selected from amongst those who show record performance in a number of tournaments played at various levels e.g. institutional level, district level, regional level and National level. **Outstanding performers represent the country at the national and international level.**

Nationalized banks, public sector undertakings, corporate houses and some private groups recruit outstanding sports persons. **TATA, BPCS, MRF, IOC etc have their own sports team to compete in matches/tournaments.**

**Sports manager:** in physical education, now days, emphasis is given on the development of desirable management competencies or skill so that an individual is able to manage

office, finances, human resources, sports facilities, sports competitions, sports persons, sports teams, events etc.



Various institutes in India have set up sports management courses with the aim of training individuals in the different aspects related with field. A job as a sports manager in a reputed sports management team like Tigers from India is a very lucrative job. Many private and government sponsored event. Clubs, hotels, gymnasiums and sport centers also hire such people.

**Sports Teacher/lecture (Teaching job):** physical education occupies a dignified position in the higher education sector apart from teaching in training colleges physical education has been included as an elective subject in the degree course (B.A. B. SC) level. Physical education professional, who so ever qualifies NET, SLET, or having M. Phil, or Ph.D degree may get job as Asst. Professor or Lecturer in colleges.

**Sports coach (coaching job):** Coaching - Trained coaches are in demand at all the training centers and by state and central sports bodies. An individual proficient in coaches training in the National Institute of Sports and become certified coach persons with a degree or master's degree in physical Education are considered to be more suitable for this profession.



**Gym instructor (Fitness Sector):** Today fitness training is booming business and there are many opportunities the fitness sector, career opportunities in this field are that of fitness instructor, personal trainer, fitness consultant, fitness specialist, physical therapy

assistant, health and life style coordinator. They work in local health clubs, for professional sports teams, college athletic departments etc..



Sports officials: As the sports competitions are becoming more intense, professionalism taking the top and front seat win and lose decide the earning of professional players, the officiating has also become a profession of lucrative earning. The officials for cricket, tennis, football or rugby league, boxing wrestling etc are as important part of the sports any other (training coaching, selection, competition, nutrition etc.)



**Sports event coordinator:** some of the universities in India and abroad provide training to become qualified event manager. Now a day, even organizing a small birthday party of a kid needs expertise to manage it efficiently.

An event involves many coordinative activities- preparation of sports facilities, arrangement of finances, controlling of finances, arrangement of accommodation for sportsmen and officials, arrangement of official, arrangement of refreshment and hospitality, arrangement of catering, arrangement of cleanliness, arrangement of medical facility etc....



**Sports journalist and commentators:** sports journalism is an area where the Physical education and sports science experts can be worthwhile. Those with communicating skills can take on sports commentating, or sports journalism, working with television, newspapers or magazines that have a sports column or programe. Sports channel such as star sports, ESPN TEN SSPORTS, ZEE SPORTS and DD sports have commentators, directors and presenters to prepare and present sports programmes.



**Sports software engineers:** conducting mega sports events in which more than ten thousand sports competitors and thousands officials participate from the globe has forced the professional physical educationist to open up another area of study to prepare sports software engineers to manage and conduct the mega sports events like Olympic games, commonwealth Games, Asian Games, World Cups.



Marketing and manufacturing sports equipment: In physical Education courses, the trainees are prepared for sport marketing (Equipment and players) also input is given for manufacturing of sports equipment and preparing sports apparels. The aspirants get advance training in the field and they get in to sports marketing.



Questions regarding above **topic 1 IS** given below:

1. Write in detail career aspect in physical education. Explain any two.
2. List various career options available in the field of physical education. Discuss any two of them?
3. Write short notes on the following:
  - Role of sports journalist
  - Role of sports coach
  - Role of a sports manager
  - Role of soft ware engineer
  - Role of sports coordinator or event manager
  - Sports officials / officiating
  - Marketing and manufacturing sports equipment
  - Professional sportsmen
  - Gym instructor
  - Sports Teacher or Lecturer (Teaching job)