```
catalog = {
    "Product A": {"price": 20},
    "Product B": {"price": 40},
    "Product C": {"price": 50}
}


discount_rules = {
    "flat_10_discount": {"threshold": 200, "discount_amount": 10},
    "bulk_5_discount": {"threshold": 10, "discount_percent": 5},
    "bulk_10_discount": {"threshold": 20, "discount_percent": 10},
    "tiered_50_discount": {"quantity_threshold": 30, "product_threshold": 15, "discount_percent": 50}
}


gift_wrap_fee = 1
shipping_fee_per_package = 5
items_per_package = 10


def calculate_discount(quantity):
    discount_applied = None
    discount_amount = 0


    if sum(quantity.values()) > discount_rules["flat_10_discount"]["threshold"]:
        discount_applied = "flat_10_discount"
        discount_amount = discount_rules["flat_10_discount"]["discount_amount"]
```

```
    for product_name, product_quantity in quantity.items():
        if product_quantity > discount_rules["bulk_5_discount"]["threshold"]:
            discount_applied = "bulk_5_discount"
            discount_amount = catalog[product_name]["price"] * product_quantity *
(discount_rules["bulk_5_discount"]["discount_percent"] / 100)

    if sum(quantity.values()) > discount_rules["bulk_10_discount"]["threshold"]:
        discount_applied = "bulk_10_discount"
        discount_amount = sum(catalog[product_name]["price"] * product_quantity for product_name,
product_quantity in quantity.items()) * (discount_rules["bulk_10_discount"]["discount_percent"] /
100)

    if sum(quantity.values()) > discount_rules["tiered_50_discount"]["quantity_threshold"]:
        for product_name, product_quantity in quantity.items():
            if product_quantity > discount_rules["tiered_50_discount"]["product_threshold"]:
                discount_applied = "tiered_50_discount"
                discount_amount = catalog[product_name]["price"] * (product_quantity -
discount_rules["tiered_50_discount"]["product_threshold"]) *
(discount_rules["tiered_50_discount"]["discount_percent"] / 100)

    return discount_applied, discount_amount


def calculate_total_cost(quantity):
    subtotal = 0
    discount_applied, discount_amount = calculate_discount(quantity)
    shipping_fee = 0
    gift_wrap_total_fee = 0
```

```
    for product_name, product_quantity in quantity.items():
        subtotal += catalog[product_name]["price"] * product_quantity

    for product_quantity in quantity.values():
        gift_wrap_total_fee += product_quantity * gift_wrap_fee

    total_items = sum(quantity.values())
    num_packages = total_items // items_per_package
    if total_items % items_per_package != 0:
        num_packages += 1
    shipping_fee = num_packages * shipping_fee_per_package

    total = subtotal - discount_amount + shipping_fee + gift_wrap_total_fee

    return subtotal, discount_applied, discount_amount, shipping_fee, gift_wrap_total_fee, total

quantity = {}
gift_wrapping = {}

for product_name in catalog.keys():
    quantity[product_name] = int(input(f"Enter the quantity of {product_name}: "))
    gift_wrapping[product_name] = input(f"Should {product_name} be wrapped as a gift? (yes/no): ").lower() == "yes"

subtotal, discount_applied, discount_amount, shipping_fee, gift_wrap_fee, total = calculate_total_cost(quantity)

print("\n--- Product Details ---")
```

```
for product_name in catalog.keys():
    print(f"{product_name}: Quantity - {quantity[product_name]}, Total Amount - ${catalog[product_name]['price'] * quantity[product_name]}")

print(f"\nSubtotal: ${subtotal}")

if discount_applied:
    print(f"Discount Applied: {discount_applied}, Discount Amount: ${discount_amount}")

print(f"Shipping Fee: ${shipping_fee}")
print(f"Gift Wrap Fee: ${gift_wrap_fee}")
print(f"Total: ${total}")
```