IT314 Software Engineering

BlackBox Testing
GROUP 29 - Market Connect
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Black-Box Test Design Report

Marketplace System – Non-Functional Validation Testing
Using ECP + BVA

Introduction

This document presents the Black-Box Test Design Report for the Marketplace System backend. The testing strategy uses *Equivalence Class Partitioning (ECP)* and *Boundary Value Analysis (BVA)* to validate all inputs handled by the Joi-based backend validators.

The objective is to:

- Verify robustness of all input fields.

- Ensure APIs reject malformed or out-of-range data.

- Validate correct error messages and status codes.

This report is designed for academic submission and professional QA usage.

Test Scope

The following modules are covered:

1. User Authentication & Profile

2. Address Schema

3. Product Management

4. Cart & Orders

5. Payments

6. Coupons

7. Reviews

8. Returns

9. Auctions

10. Shared Services (filters, pagination, search)

Assumptions

- Joi validation rules in `/Backend/validations/*.js` are correct and up-to-date.

- Backend follows REST principles with consistent error messages.

- Seed data is initialized through `sample-data/init.js`.

Test Design Summary

User Authentication & Profile Validation

Field	Valid Classes	Invalid Classes	Boundary Values	Expected Outcome
name	≥3 chars, trimmed	<3 chars, empty, whitespace	2/3/4 chars	400 error for short name
email	RFC-compliant	missing @, missing TLD, >254 chars	253/254/255 chars	400 invalid email
password	≥6 chars with U/L/digit	missing digit, missing case, <6 chars	5/6 chars	password rule error
confirmPassword	matches password	mismatch, empty	N/A	400 mismatch
mobNo	10-digit Indian (6–9 start)	letters, symbols, length ≠10	9/10/11 digits	400 mobile error
role	buyer, seller, both	others, case mismatch	N/A	400 invalid role
googleId/token	non-empty string	missing/empty	N/A	400
shopName	non-empty	empty/null	N/A	400

Address Schema Validation

street/city/state	non-empty	empty, whitespace-only	N/A	400 required field
pincode	exactly 6 digits	5/7 digits, letters	5/6/7	400 "Pincode must be exactly 6 digits"
country	string (default India)	non-string	N/A	400

Product Management Validation

title	3–140 chars	<3, >140	2/3/140/141	400
description	≤5000 chars	>5000 chars	4999/5000/5001	400
categoryId	24 hex chars	non-hex, wrong length	23/24/25	400
tags	array of strings	non-array, non-string	N/A	400
images	valid URI fields	invalid URI, missing fields	N/A	400
price	≥0	negative, non-number	-1/0/1	400
currency	INR, USD	others	N/A	400
stock	integer ≥0	float, negative	0/1/0.5	400
condition	new/used/refurbished	others	N/A	400
specs	object string→string	invalid types	N/A	400

Cart & Orders Validation

orderItems	≥1 item	empty array	0/1 items	400
productId	24-char hex or "cart"	others	23/24/25	400
quantity	integer ≥1	0, negative, float	0/1/1.5	400
shippingInfo	valid address	invalid fields	–	400
couponCode	uppercase	non-string	N/A	400
status	allowed enum	others	N/A	400

Payment Validation

orderId	24-char hex	invalid length/hex	23/24/25	400
razorpay IDs/signature	non-empty	missing/empty	N/A	400
refundAmount	>0 or omitted	negative, zero	-1/0/1	400
reason	≤200 chars	>200 chars	199/200/201	400

Coupon Validation

code	uppercase alphanumeric	lowercase, long	min/max	400
discountType	percentage/flat	others	N/A	400
discountValue	positive	negative, >100%	0/1/100/101	400
minPurchase	≥0	negative	-1/0/1	400
maxUsage	integer ≥1	0, float	0/1/2	400
expiry	future date	past date	T-1, T, T+1	400

Review Validation

rating	1–5	0, 6, floats	0/1/5/6	400
comment	valid length	too long	min/max	400
IDs	24-char hex	invalid	23/24/25	400

Return Validation

reason	non-empty	empty	N/A	400
return window	within allowed days	expired	final day/+1	400

Auction Validation

bid amount	≥base price	<base price	base-1/base/base+1	400
timings	start < end	start ≥ end	edge times	400
IDs	24-char hex	invalid	23/24/25	400

Sample Test Cases

Email Validation

Test ID	Input	Class	Expected
EMAIL_VALID_01	user@example.com	Valid	200
EMAIL_INVALID_01	userexample.com	Missing @	400
EMAIL_BVA_01	254-char email	Valid boundary	200
EMAIL_BVA_02	255-char email	Invalid boundary	400

Product Title Validation

TITLE_VALID_01	3-char string	Valid	200
TITLE_INVALID_01	2-char string	Invalid	400
TITLE_BVA_01	140 chars	Valid boundary	200
TITLE_BVA_02	141 chars	Invalid boundary	400

Refund Amount

REFUND_VALID_01	amount omitted	full refund	200
REFUND_VALID_02	50	partial refund	200
REFUND_INVALID_01		invalid	400
REFUND_INVALID_02	100	invalid	400

Execution Strategy

- Postman for functional tests.

- Newman CLI for automation.

- JMeter for load + validation.

- Logs maintained per test ID: Input → Expected → Actual.

Entry & Exit Criteria

Entry

- API server running.

- Seed data initialized.

- Postman environment configured.

Exit

- All valid partitions return 200.

- All invalid partitions return correct error messages.

- No unhandled exceptions.

Conclusion

This report presents a complete Black-Box testing design for all validation inputs in the Marketplace System. The use of ECP and BVA ensures comprehensive coverage and robust reliability of backend validation.