iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** V **Month of publication:** May 2020

DOI: http://doi.org/10.22214/ijraset.2020.5474

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

Security Feature Analysis of New Indian Banknotes

Prasansha Singla
B.Sc. Forensic Science, Amity University, Panchgaon, Manesar, Gurugram, Haryana – 122413, India

Abstract: ***Banknotes are a type of negotiable instrument which are issued by the RBI and payable to bearer on demand. It is one of the most frequently used things in our daily life for purchasing and exchanging of things. So it has more chance to being counterfeited. In India, there are more cases of the counterfeit of the banknotes. Therefore in order to prevent its counterfeit, the security features are incorporated into the banknotes either during its manufacturing and its preparation. These features secure the banknotes from counterfeiting. There are number of security features that can seen under the normal light condition and help the layman to identified and find the difference between the genuine and counterfeited one. This paper makes efforts to security features which are present in our new banknotes. By adding new security features in the banknotes, government reduce the chance of counterfeiting of bank notes.***

Keywords: Security features, Banknotes, Counterfeit, Watermark, Authenticity and Examination

I. INTRODUCTION

The study of banknotes is called Notaphily. In our day to day life, money is the main source of purchasing and exchanging of goods. The RBI has the sole authority to issue banknotes in India.[1] Reserve bank, like other central banks over the world, changes the designed and features which are present in the banknotes in order to prevent them from the counterfeiting. To ensure the counterfeiting may not happen, RBI incorporated some security features were added to differentiated genuine banknotes from the counterfeited one.[4] These features are used to establish the identity of a document and these features are generally the class characteristics of a document. Currency replication or the counterfeiting is the main threat not only in India but all over the world and to prevent the counterfeiting new features were introduced. The main thing is to secure the paper of banknotes otherwise they can be easily counterfeited. By making the paper of banknotes many sophisticated and high levelled techniques were used. Paper money is made up of 100% pure cotton which is known as COMBER. It is mainly the residues of the cotton from the textile mills. These have the crackling sound due to the presence of the Titanium Dioxide and having the high folding strength of 6000-7000 folds. When these paper examination under UV it does not give any fluorescence. During the manufacturing of the paper many other features were also added like Watermarks, Optical threads etc. Watermarks are also the important features which do not counterfeited easily. These are produced by using the Dandy Roll. There are number of watermarks which are incorporated in the paper during its manufacturing and these are Electrolytic watermarks, Mahatma Gandhi portrait, RBI watermark, Secret denomination and many other. Omron features, hologram, complicated portrait, Background decoration and the IR glowing features are most important and most complicated features.[5,6] China developed the first paper currency in Tang Dynasty during the 7th century. China used the mulberry trees for making the paper. During that time these trees were guard by the security persons to ensure that no other person without any authority to cut the trees and try to counterfeiting. The people who try to counterfeit the money were punishable by death. After that, usage of paper currency was spread all over the Yuan Dynasty. After the china, Europe introduced paper money in 13th century. In India, paper money was introduced in the 1770 by Bank of Hindustan, Calcutta while the Bank of England was introduced currency in 1862. In India, printing of currency notes was first started by the Government Security Press, Nasik which was established in 1928. In 1934, RBI took control over it. So, hence counterfeiting of money is not the new or recent thing. It was started when the Greek start making the coinage money in the 600 B.C. So, history told us that counterfeiting of money has been an old evil. So in today world, all the money making authorities adding many security features which prevent the banknotes from counterfeiting. Security feature of a currency which is embedded in the paper help to distinguished the genuine banknotes from the counterfeited one. It is very essential to know the features which are present in our banknotes to determine whether it is real one from forged one [7]

A. Security Features of Banknotes

After the demonetization, Indian government introduce the new banknotes which having the some advance features. These security features help to secure the document and provide the authenticity of document. Before discussing about the security features, it is important to know to hold banknotes to see the features clearly and properly. The front side where the denomination is printed is known as Obverse Side and other side is called Reverse Side. Here are some security features lists which are present in the new currency:[2]

©IJRASET: All Rights are Reserved

II. 2000

1) *Base Colour:* Magenta
2) *Dimension:* 66mm × 166mm
3) *Theme:* Motif of Mangalayan

A. *In Daylight*

1) *Obverse Side*

a) Numeral 2000 can be seen on the extreme left of the currency note
b) Denominational numeral 2000 in devnagri on the left side
c) Portrait of Mahatma Gandhi in centre
d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side
e) Number panel with numeral growing from small to big in size on the top left side and bottom right side
f) Numeral with rupee symbol with 2000 in given green ink which change with change in angle i.e. green to blue, on bottom right
g) Ashoka pillar emblem on the right side
h) Seven angular bleed line on left and right side in raised point.

2) *Reverse Side*

a) Year in which the note is printed can be seen on extreme left side of the currency note.
b) Swatch Bharat logo with slogan present on bottom, extreme left side.
c) Motif of Mangalayan is present at the centre but slightly shifted towards the right side.
d) Language panel is present on slightly left side



(Obverse side)



(Reverse side)

©IJRASET: All Rights are Reserved

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 2000 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Watermark of 2000 numeral is present on the top extreme left side
5) Watermark of 2K symbol is present on bottom extreme left side
6) Behind the security wire dark and light bands can be seen
7) On the security wire RBI, 2000 and Bharat in Hindi can be seen



C. In UV Light

1) Obverse Side

a) Various thread marks can be seen on various position across the currency notes
b) Various bands on the currency notes can be seen which given fluorescence

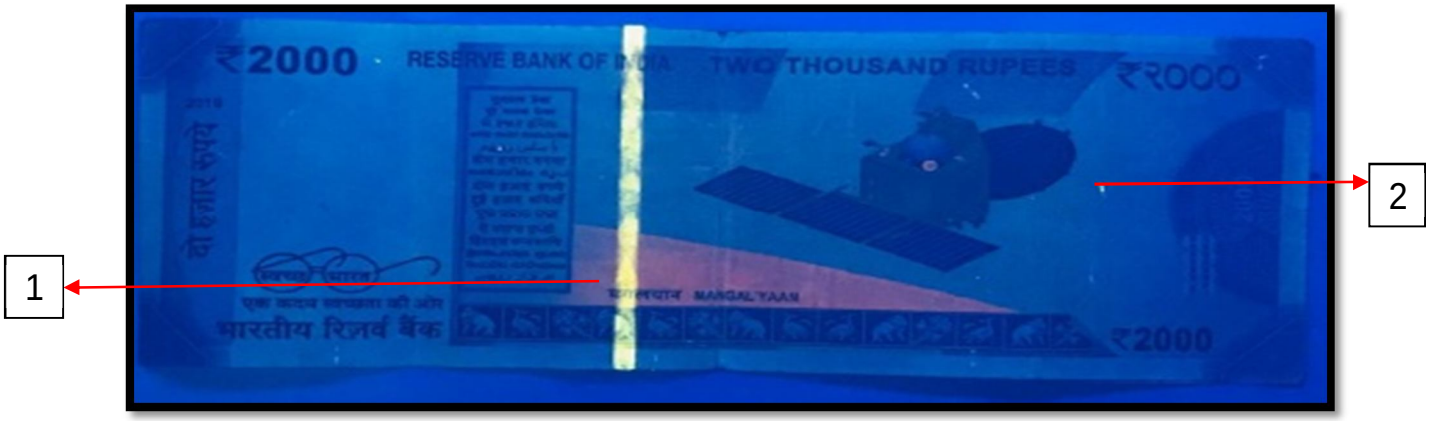
2) Reverse Side

a) Security wire gives fluorescence
b) Various thread marks can be seen

©IJRASET: All Rights are Reserved



(Obverse side)



(Reverse side)

D. In Microscopic Examination

1) Bharat in Hindi can observed on security wire of 2000
2) Left side of 2000 rupee notes "RBI 2000 INDIA"
3) "RBI" present on the spectacles of Mahatma Gandhi
4) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar

III. 500

1) Base Colour: Stone Grey
2) Dimension: 65mm × 149mm
3) Theme: Motif of Red Fort

A. In Daylight

1) Obverse Side

a) Numeral 500 can be seen on the extreme left of the currency note
b) Denominational numeral 500 in devnagri on the left side
c) Portrait of Mahatma Gandhi in centre
d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side
e) Number panel with numeral growing from small to big in size on the top left side and bottom right side
f) Numeral with rupee symbol with 500 in given green ink which change with change in angle i.e. green to blue, on bottom right
g) Ashoka pillar emblem on the right side
h) Five angular bleed line on left and right side in raised point.

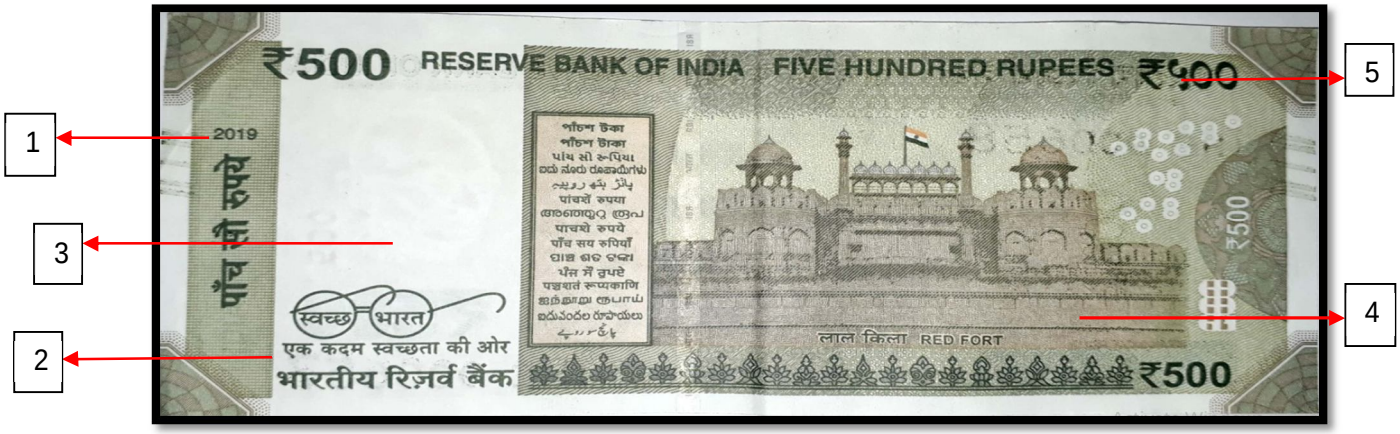
©IJRASET: All Rights are Reserved

2) Reverse Side

a) Year in which the note is printed can be seen on extreme left side of the currency note.
b) Swatch Bharat logo with slogan present on bottom, extreme left side.
c) Language panel is present on slight left side
d) Motif of Red fort is present at the centre but slightly shifted towards the right side.
e) The number 500 in devnagri present on top extreme right



(Obverse side)



(Reverse side)

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 500 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Watermark of 500 numeral is present on the top extreme left side
5) Watermark of 500 symbol is present on bottom extreme left side
6) Behind the security wire dark and light bands can be seen
7) On the security wire RBI, 500 and Bharat in Hindi can be seen

©IJRASET: All Rights are Reserved



C. In UV Light

1) Obverse Side

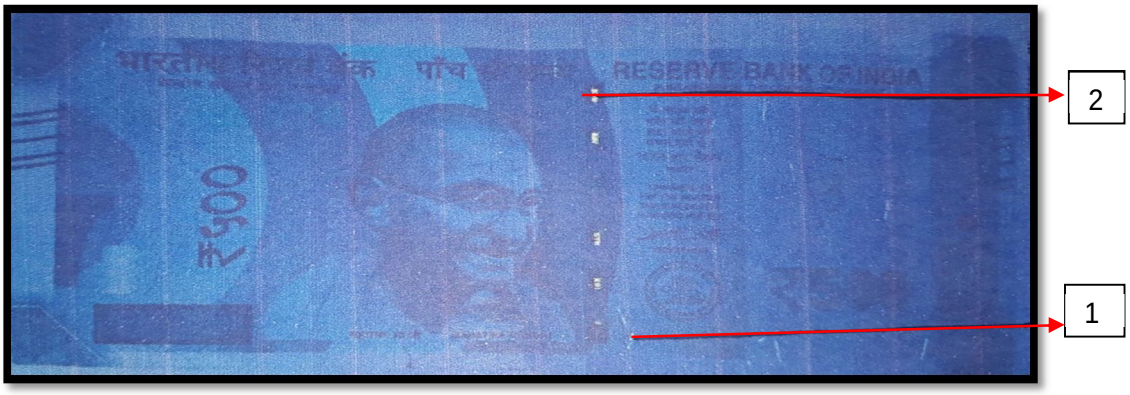
a) Various thread marks can be seen on various position across the currency notes

b) Various bands on the currency notes can be seen which given fluorescence

2) Reverse Side

a) Security wire gives fluorescence

b) Flag present on the Red fort motif give florescence



(Obverse side)

©IJRASET: All Rights are Reserved



(Reverse side)

D. In Microscopic Examination

1) "RBI 500 INDIA" present above the STR
2) "RBI" present on the spectacles of Mahatma Gandhi
3) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar

IV. 200

Base colour: Bright Yellow
Dimension: 66mm × 146mm
Theme: Motif of Sanchi Stupa

A. In Daylight

1) Obverse Side

a) Numeral 200 can be seen on the extreme left of the currency note
b) Denominational numeral 200 in devnagri on the left side
c) Portrait of Mahatma Gandhi in centre
d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side
e) Number panel with numeral growing from small to big in size on the top left side and bottom right side
f) Numeral with rupee symbol with 200 in given green ink which change with change in angle i.e. green to blue, on bottom right
g) Ashoka pillar emblem on the right side
h) Four angular bleed line with two directors circular in between the pair of line on left and right side.

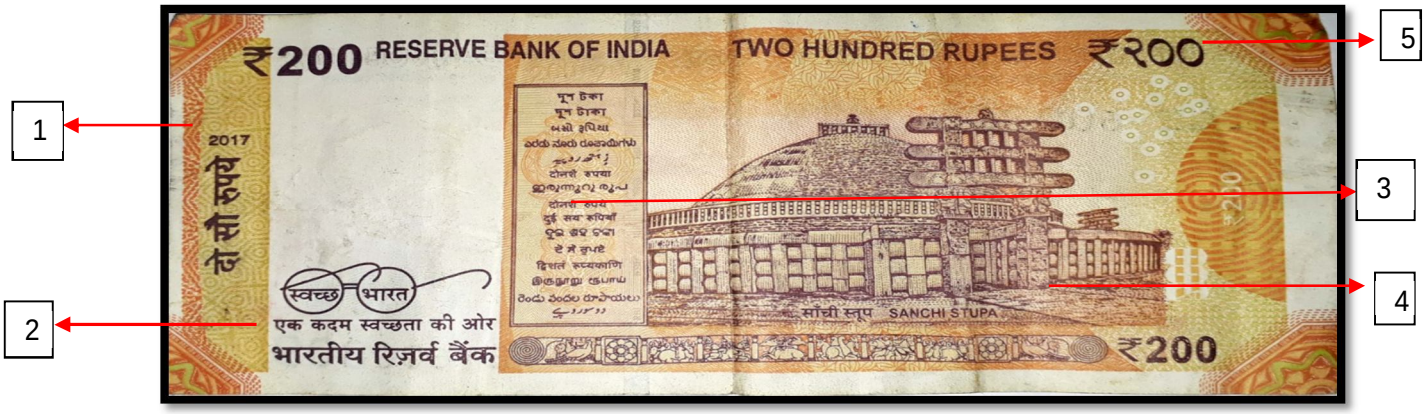
2) Reverse Side

a) Year in which the note is printed can be seen on extreme left side of the currency note.
b) Swatch Bharat logo with slogan present on bottom, extreme left side.
c) Language panel is present on slight left side
d) Motif of Sanchi Stupa is present at the centre but slightly shifted towards the right side.
e) The denominational number 200 in devnagri present on top extreme right



(Obverse side)

©IJRASET: All Rights are Reserved



(Reverse side)

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 200 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Watermark of 200 numeral is present on the top extreme left side
5) Watermark of dark and light bands can be seen behind the security wire
6) On the security wire RBI, 500 and Bharat in Hindi can be seen



C. In UV Light

1) Obverse Side

a) Various thread marks can be seen on various position across the currency notes
b) Various bands on the currency notes can be seen which given fluorescence

©IJRASET: All Rights are Reserved

2) Reverse Side

a) Security wire gives fluorescence

b) Various thread marks can be seen



(Obverse side)



(Reverse side)

D. In Microscopic Examination

1) "RBI 200 INDIA" present above the STR

2) "BHARAT" present on the spectacles of Mahatma Gandhi

3) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar

V. 100

1) Base Colour: Lavender

2) Dimension: 66mm × 142mm

3) Theme: Motif of "Rani Ki vav"

A. In Daylight

1) Obverse Side

a) Numeral 100 can be seen on the extreme left of the currency note

b) Denominational numeral 100 in devnagri on the left side

c) Colour shift windowed security thread at the centre with inscription

d) Portrait of Mahatma Gandhi in centre

e) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side

f) Number panel with numeral growing from small to big in size on the top left side and bottom right side

g) Numeral with rupee symbol with 100 in given green ink which change with change in angle i.e. green to blue, on bottom right

h) Ashoka pillar emblem on the right side

i) Four angular bleed line on left and right side in raised point.

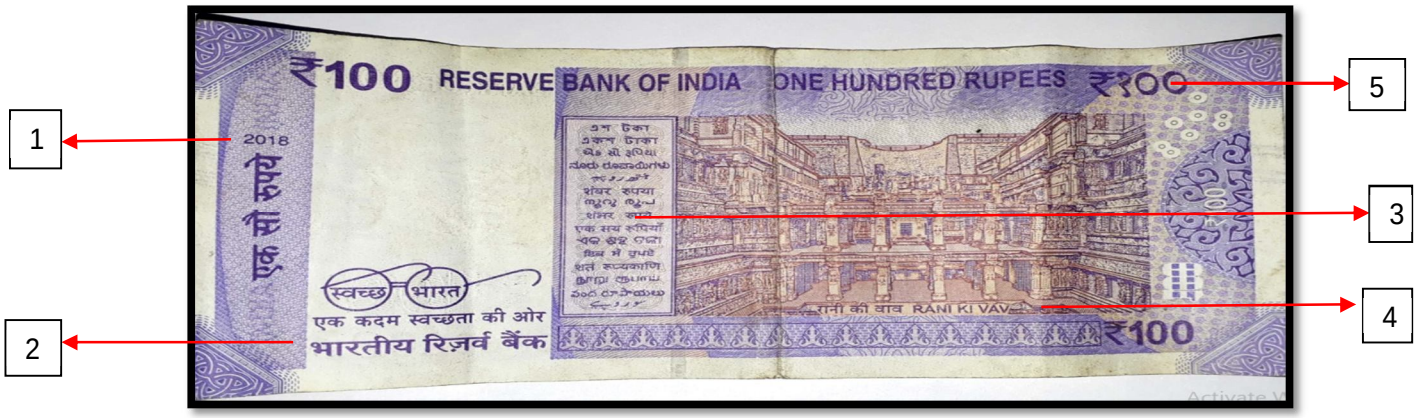
©IJRASET: All Rights are Reserved

2) Reverse Side

1) Year in which the note is printed can be seen on extreme left side of the currency note.
2) Swatch Bharat logo with slogan present on bottom, extreme left side.
3) Language panel is present on slight left side
4) Motif of Motif of "Rani Ki vav" is present at the centre but slightly shifted towards the right side.
5) The denominational numeral 100 in devnagri present on top extreme right



(Obverse side)



(Reverse side)

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 100 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Behind the security wire dark and light bands can be seen
5) On the security wire RBI, 100 and Bharat in Hindi can be seen



©IJRASET: All Rights are Reserved



C. In UV Light

1) Various thread marks can be seen on various positions across the currency notes

2) The band formation can be seen



D. In Microscopic Examination

1) "RBI 100 INDIA" present above the STR

2) "RBI" present on the spectacles of Mahatma Gandhi

3) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar

4) Colour change present on Ashoka Emblem

VI. 50

1) Base Colour: Fluorescent Blue

2) Dimension: 66mm × 135mm

3) Theme: Motif of Hampi with Chariot

A. In Daylight

1) Obverse Side

a) Numeral 50 can be seen on the extreme left of the currency note

b) Denominational numeral 50 in devnagri on the left side

c) Portrait of Mahatma Gandhi in centre

d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side

e) Number panel with numeral growing from small to big in size on the top left side and bottom right side

f) Numeral with rupee symbol with 50 in given green ink which change with change in angle i.e. green to blue, on bottom right

g) Ashoka pillar emblem on the right side

h) Some flower like structure can also be seen in present on top left side

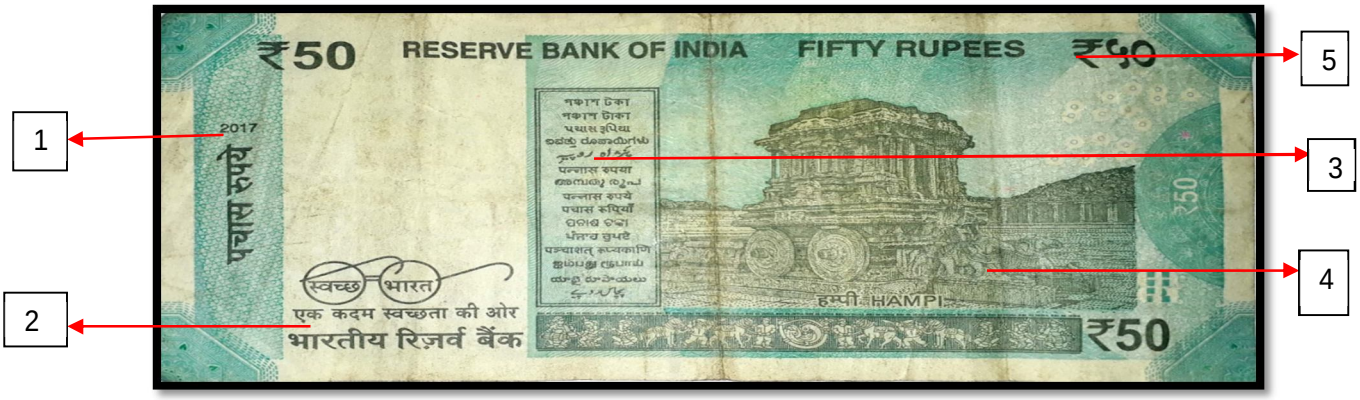
©IJRASET: All Rights are Reserved

2) Reverse Side

a) Year in which the note is printed can be seen on extreme left side of the currency note.
b) Swatch Bharat logo with slogan present on bottom, extreme left side.
c) Language panel is present on slight left side
d) Motif of Hampi with Chariot is present at the centre but slightly shifted towards the right side.
e) The number 50 in devnagri present on top extreme right



(Obverse side)



(Reverse side)

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 50 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Watermark of 50 numeral is present on the top extreme left side
5) Behind the security wire dark and light bands can be seen
6) On the security wire RBI, 50 and Bharat in Hindi can be seen



©IJRASET: All Rights are Reserved



C. In UV Light

1) Obverse Side

a) Various thread marks can be seen on various position across the currency notes

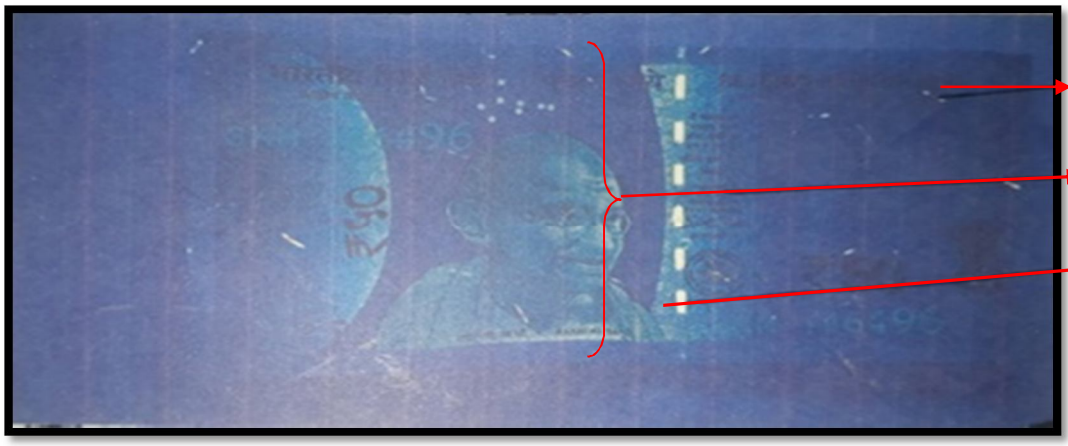
b) Various bands on the currency notes can be seen which given fluorescence

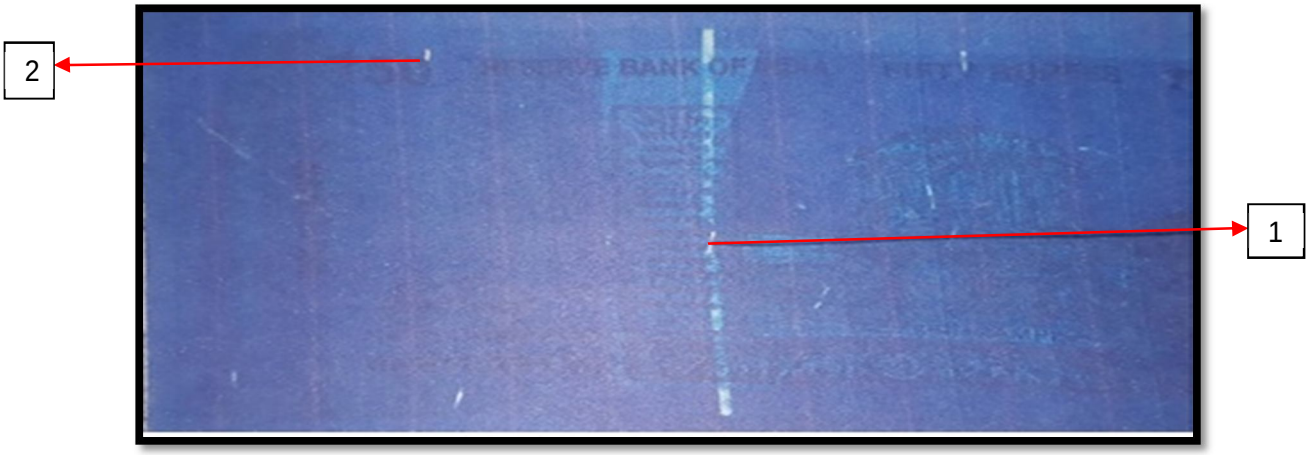
c) Security wire give fluorescence

2) Reverse Side

a) Security wire gives fluorescence

b) Various thread marks were also seen at different position





©IJRASET: All Rights are Reserved

D. In Microscopic Examination

1) A right side of Mahatma Gandhi has "13" microprinted
2) "50" Microprinting on the left side margin of 50 curve
3) Microprinted "50 INDIA RBI" in front at the left side
4) Left side curve of 50 Microprinting " RBI 50"
5) "RBI 50 INDIA" Microprinting present at bottom of pillar
6) Between the wheels "50 RBI"

VII. 20

1) Base Colour: Greenish Yellow colour
2) Dimension: 63mm × 129mm
3) Theme: Motif of Ellora Caves

A. In Daylight

1) Obverse Side

a) Numeral 20 can be seen on the extreme left of the currency note
b) Denominational numeral 20 in devnagri on the left side
c) Portrait of Mahatma Gandhi in centre
d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side
e) Number panel with numeral growing from small to big in size on the top left side and bottom right side
f) Numeral with rupee symbol with 20 in given green ink which change with change in angle i.e. green to blue, on bottom right
g) Ashoka pillar emblem on the right side

2) Reverse Side

1) Year in which the note is printed can be seen on extreme left side of the currency note.
2) Swatch Bharat logo with slogan present on bottom, extreme left side.
3) Language panel is present on slight left side
4) Motif of Ellora Caves is present at the centre but slightly shifted towards the right side.
5) The number 20 in devnagri present on top extreme right



©IJRASET: All Rights are Reserved

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 20 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Watermark of 20 numeral is present on the top extreme left side
5) Behind the security wire dark and light bands can be seen
6) On the security wire RBI, 20 and Bharat in Hindi can be seen



C. In UV Light

1) Obverse Side

a) Various thread marks can be seen on various position across the currency notes
b) Various thread marks are present

2) Reverse Side

a) Security wire gives fluorescence
b) Various thread marks can be present and give florescence



©IJRASET: All Rights are Reserved



D. In Microscopic Examination

a) "RBI 20 INDIA" present left side curve
b) "20" present in right ear of Mahatma Gandhi
c) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar
d) Microprinting "BHARAT(in Hindi)" is present in the spectacles of Mahatma Gandhi
e) Security window of thread microprinted "BHARAT(in Hindi), RBI"

VIII. 10

1) Base Colour: Chocolate Brown
2) Dimension: 63mm × 123mm
3) Theme: Motif of "Sun Temple, Konark"

A. In Daylight

1) Obverse Side

a) Numeral 10 can be seen on the extreme left of the currency note
b) Denominational numeral 10 in devnagri on the left side
c) Portrait of Mahatma Gandhi in centre
d) Guarantee clause, Governor's signature with promise clause and RBI emblem towards right side
e) Number panel with numeral growing from small to big in size on the top left side and bottom right side
f) Numeral with rupee symbol with 10 in given green ink which change with change in angle i.e. green to blue, on bottom right
g) Ashoka pillar emblem on the right side

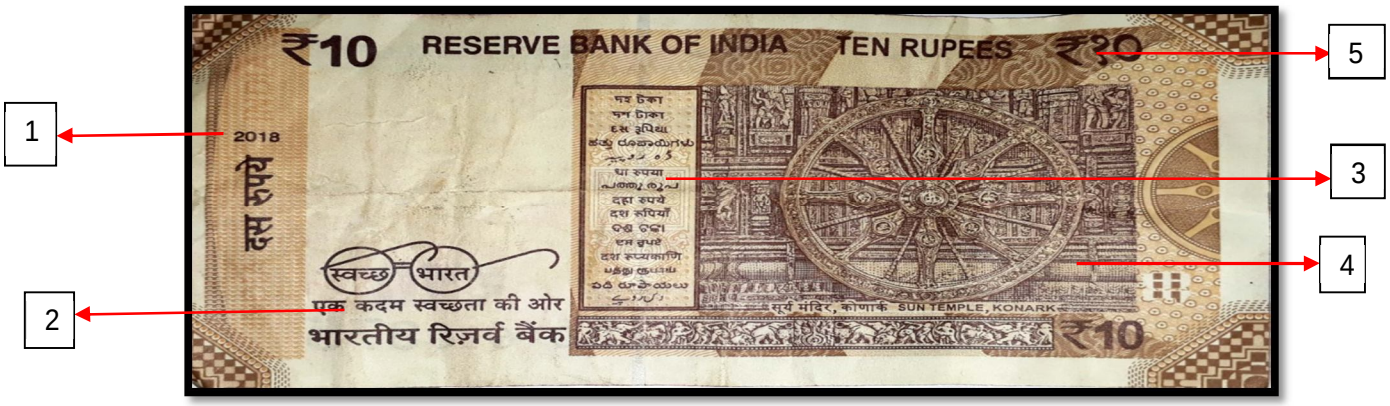
2) Reverse Side

a) Year in which the note is printed can be seen on extreme left side of the currency note.
b) Swatch Bharat logo with slogan present on bottom, extreme left side.
c) Language panel is present on slight left side
d) Motif of "Sun Temple, Konark" is present at the centre but slightly shifted towards the right side.
e) The number 10 in devnagri present on top extreme right



(Obverse side)

©IJRASET: All Rights are Reserved



(Reverse side)

B. In Transmitted Light

1) Watermark of portrait of Gandhi ji is present on extreme right side
2) Numeral 10 is present beside the portrait of Mahatma Gandhi on the right side itself
3) Watermark of RBI is present on the centre between the security wire and the devnagri numeral
4) Behind the security wire dark and light bands can be seen
5) On the security wire RBI, 10 and Bharat in Hindi can be seen





C. In UV Light

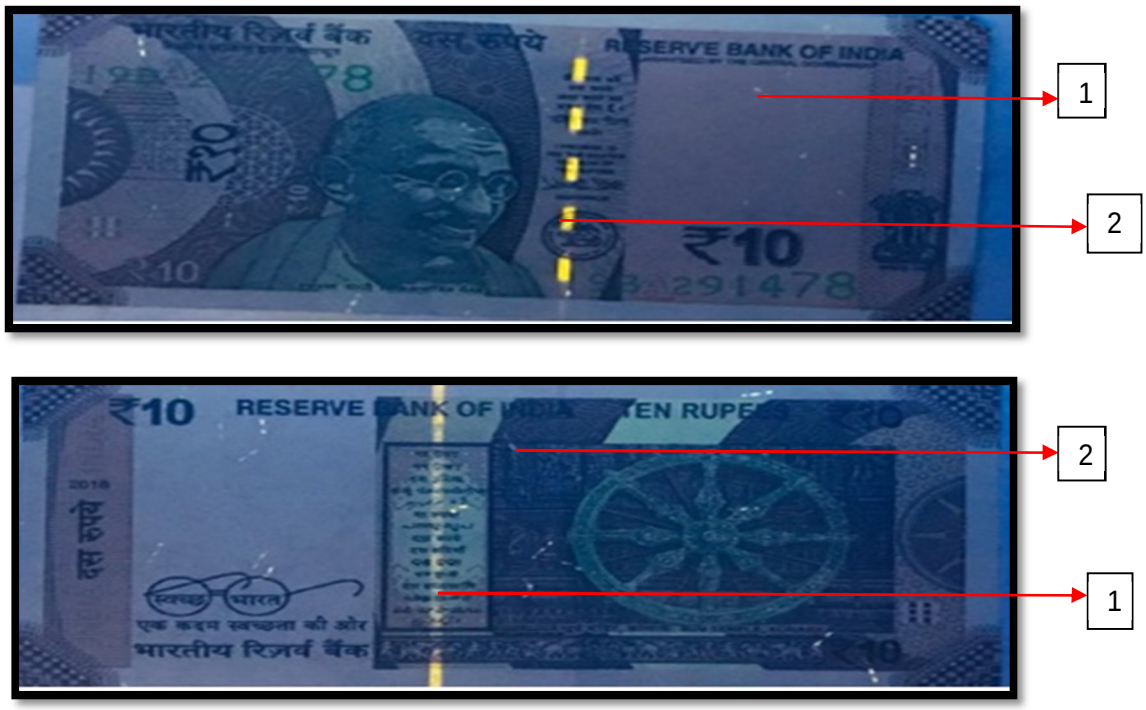
1) Obverse Side

a) Various thread marks can be seen on various position across the currency notes
b) Various bands on the currency notes can be seen which given fluorescence

2) Reverse Side

a) Security wire gives fluorescence
b) Various thread marks can be seen on currency notes

©IJRASET: All Rights are Reserved



D. In Microscopic Examination

1) "RBI 10 INDIA" present on right corner
2) "BHARAT(in Hindi)" present on the spectacles of Mahatma Gandhi
3) "BHARAT(in Hindi), INDIA" present on Mahatma Gandhi collar
4) "BHARAT (in Hindi)", on left side of banknote.

IX. CONCLUSION

This paper is to find out the different security features which are present in our new banknotes. This study is the keen and detailed study about each and every feature which are present in the 2000, 500, 200, 100, 50, 20 and 10 notes and help the person in identification in the genuine and the forged one.[3] This study also exposes the features which are not counterfeited or photocopied or scanned. These are many features which are introduced by the government to prevent the banknotes from the counterfeiting and also increase the authenticity of the document. Hence, everyone must have the knowledge to distinguish the genuine from counterfeited banknotes.

A. Abbreviation

No abbreviation was used

B. Availability of the Data and Material

Please contact author for data request

REFERENCE

[1] https://www.rbi.org.in/scripts/ic_banknotessecurity.aspx
[2] https://paisaboltahai.rbi.org.in/
[3] https://www.mintageworld.com/note/20-india/
[4] Binod Prasad Yadav, C. S. Patil, R. R. Karhe, P.H Patil , "An automatic recognition of fake Indian paper currency note using MATLAB", IJESIT, Volume 3, Issue 4, July 2014.
[5] NeeruRathee, ArunKadian, RajatSachdeva, VijulDalel, YatinJaie, "Feature Fusion for Fake Indian Currency Detection" 2016 International Conference on Computing for Sustainable Global Development (INDIACom), pp.1265-1270.
[6] Sagar S. Lawade1, Gayatri S. Hedau2, Apurva C. Ramgirwar3, "FAKE CURRENCY DETECTION USING IMAGE PROCESSING", International Journal of Research In Science & Engineering, Volume: 1.
[7] Saiyed Mohammed Arshad, Devdatt Sawant Sudagar & Nausheeda B S Fake Indian Currency Detection Usingimage Processing" International Journal of Latest in Engineering and Technology, Special Issue SACAIM 2017.

©IJRASET: All Rights are Reserved

ACKNOWLEDGEMENT

Not applicable

A. Declaration

1) Funding: No funding organization is involved in this study

B. Competing Interests

The author declares that there are no competing interests.

C. Availability of Data and Material

Please contact author for data request

D. Code Availability

Not applicable

E. Author Information

Affiliations
B.Sc. Forensic Science, Amity University, Panchgaon, Manesar, Gurugram, Haryana – 122413,
India
PRASANSHA

F. Contributions

The author contributed to the design of the study. Prasansha performed the experiment and Contributed to the literature collection and manuscript preparation.

G. Corresponding Author

Not applicable

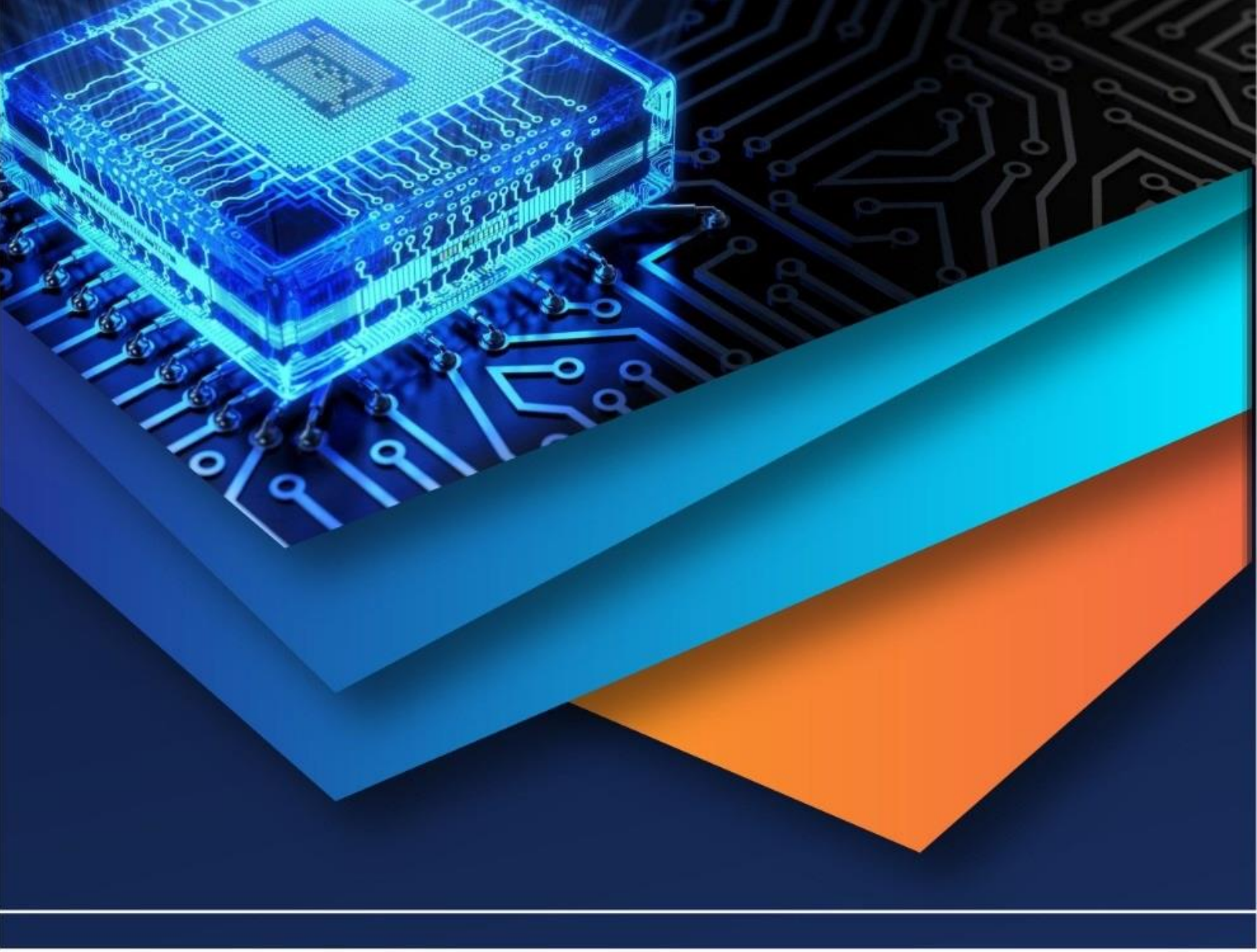
H. Ethics Declarations

Ethics approval and consent to participate
Not applicable

I. Content for publication

Not applicable

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)