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# OFFSET PRINTING MACHINE OPERATOR

## CBT Curriculum

National Vocational Certificate Level 3

Version 1 - September 2018

NAVTTC
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## 1- Introduction

This Competency Based Training curriculum is developed for National Vocational Level 3 in Printing & Packaging Technology qualification for Offset printing machine operator. This curriculum is designed to focus the need, importance and understanding of offset printing machine operator as per the current competitive, challenging and growing printing industrial demands. Level 3 qualified offset printing machine operator can help in printing press to perform color printing including other printing activities as specified at Level 2 qualified assistant offset printing machine operator. Level 3 offset printing machine operator will be able to perform other related tasks e.g. Develop professionalism, Complete documentation requirements, perform communication and manage waste in printing press.

The curriculum is written by a group of practitioners from PAPGAI supported by the TVET Reform Support Program in collaboration with National Vocational & Technical Training Commission (NAVTTC) Pakistan. Offset Printing Machine Operator to ensure input and ownership of all the stakeholders. NAVTTC approves this curriculum on the recommendation of National Curriculum Review Committee (NCRC) for the Services sector.

The curriculum shall be used as a guideline document for the implementation of Competency Based Training, and development of TLM & assessment evidence guides.

### 1.1- Entry Requirements

Entry for assessment for this qualification is open. However, entry into formal training (CBT) institute for this qualification is the person must have NVQF Level 2 Qualification in Assistant Offset Machine Operator.

### 1.2- Minimum qualification of trainer:

a. Preferably F.Sc. with 5 years of working experience in printing industry
b. Experience of teaching (at least two years)
c. Rich communication and computer skills
d. Trained for CBT implementation

### 1.3- Recommended trainer, trainee ratio

Institutional Training: 1:16~20
On Job Training 1:4~8

**1.4-Medium of instructions:**

Local / Urdu / English (depending on the learner's understanding)

**1.5- Proposed duration of Training;**

Institutional Training 03 Month
On Job Training(OJT) 03 Month

**1.6- Sequence of the modules:**

This curriculum comprises of 05 modules. The recommended delivery time is 820 hours/82 credit hrs. Delivery of the course can therefore be 5 hours/working day, 5 days a week, for 03-month institution training and 07 Hours a day for 03-month OJT (on average 22 working days a month)

Training providers are at liberty to develop other models of delivery, including part-time and evening delivery.

## 2- Overview of Curriculum

| Module | Learning Unit | Time (Hours) | | |
|---|---|---|---|---|
| | | Theory | Practical | Total |
| **A- Perform Color management**<br>**Overview:** This module describes the performance outcomes skills and knowledge required for an offset printing machine operator to perform color management at printing press by controlling L*A*B values& their matching procedure, controlling ink density in printing machine and controlling drying parameter of printed jobs. colour processing, L*A*B Value maintenance during printing process inks management, process of ink filling CPC processing are underpinning knowledge for this competency standard | LU-1-1 Control L*A*B* values<br>LU-1-2 Control ink density<br>LU-1-3 Control drying parameters | 10 | 70 | 80 |
| **B- Maintain graphic chemicals in machine**<br>**Overview:** This module describes the performance outcomes, skills and knowledge required for an offset printing machine operator to maintain graphic chemicals by maintaining pH values, maintaining conductivity of chemical in the machine and maintaining temperature of chiller to obtain desired printing results. Underpinning knowledge, required for the Competency Standard is about characteristics of chemicals used in printing machine. It is also essential for offset printing machine operator to understand how to maintain temperature of chiller of machine. | LU-2-1 Maintain pH value<br>LU-2-2 Maintain conductivity<br>LU-2-3 Maintain chiller temperature<br>LU-2-4 Maintain water level in chiller tank<br>LU-2-5 Maintain IPA in water<br>LU-2-6 Maintain fountain solution in water | 10 | 70 | 80 |

| | | | | |
|---|---|---|---|---|
| **C- Develop professionalism**<br>**Overview:** This module identifies the competencies required to develop professionalism in an offset printing machine operator in accordance with requirement of profession. A competent individual will be expected to participate in training institute level trainings, On Job Training (OJT), perform communication with others, upgrade professional skills and work in a team. This underpinning knowledge regarding development of professionalism will be sufficient to provide the basis for quality working. | LU-3-1 Participate in in-house training<br>LU-3-2 Participate in outdoor training<br>LU-3-3 Attend trade shows, workshops, seminars<br>LU-3-4 Utilize internet<br>LU-3-5 Prioritize job schedule | 10 | 30 | 40 |
| **D- Perform communication**<br>**.Overview:** This module refers to the development of skills and competencies to perform communication. It also deals with listening practice, adopting questioning technique to lead actual issues in the system, demonstrating telephonic ethics and moral techniques to deal with people related to the work. | LU-4-1 Make telephone calls<br>LU-4-2 Instruct labors<br>LU-4-3 Communicate with supervisor<br>LU-4-4 Maintain relations with people<br>LU-4-5 Perform E-mail communication | 10 | 30 | 40 |
| **E- Manage press room waste**<br>**Overview:** This module identifies the competencies required to manage waste of printing press. A competent individual will be expected to manage paper and other solid waste, liquid toxic waste and non-toxic waste. This includes underpinning knowledge regarding waste management in printing press. | LU-5-1 Manage printing press waste<br>LU-5-2 Manage toxic chemicals<br>LU-5-3 Handle non-toxic chemicals<br>LU-5-4 Manage paper waste<br>LU-5-5 Manage solid waste | 10 | 40 | 50 |
| | **Total** | **50** | **240** | **290** |

## 3- Teaching & Learning Guide - Modules

Module A: **Perform Color management**

Overview:This module describes the performance outcomes skills and knowledge required for an offset machine operator to perform colour management at printing press by controlling L*A*B values& their matching procedure, controlling ink density in printing machine and controlling drying parameter of printed jobs. Colour processing, L*A*B value maintenance during printing process inks management, process of ink filling CPC processing are underpinning knowledge for the Competency Standard

Duration: Total hours: 80 Theory10 Hrs.Practical 70 Hrs.

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU-1-1 Control L*A*B* values | **The learner will be able to**:<br>• match colour L*A*B* values with given reference as per docket/job card,<br>• maintain Delta E(∆E) of colours with in the specified range during production. | **The learner will be able to**:<br>• define colour management,<br>• enlist process colours,<br>• describe ∆E,<br>• define L*A*B Values,<br>• state procedure of LAB matching. | TH. 4 Hrs<br>PR. 4 Hrs | Offset printing machine<br>Spectrophoto-meter<br>Light booth | Class room and Press room lab/ industry |
| LU-1-2 Control ink density | **The learner will be able to**:<br>• fill ink ducts with quantity as per SOPs,<br>• maintain ink film layer manually on sheets with given reference on manual machines,<br>• maintain ink film layer by Colour Panel Controller (CPC) on sheets with given reference on advanced machines. | **The learner will be able to**:<br>• state precautionary measures adopted during ink controlling in printing machine,<br>• define ink density,<br>• define function of ink duct,<br>• state procedure of ink layer maintenance on sheet for manual printing machine,<br>• define numeric standards of ink | TH. 4 Hrs<br>PR. 4 Hrs | Offset printing machine<br>Densitometer<br>Scrapper (*chansa*) | Class room and Press room lab/ industry |

| | | | | | |
|---|---|---|---|---|---|
| | | density,<br>• describe film layer,<br>• state CPC procedure of ink layer maintenance on sheet,<br>• define various method of ink density control. | | | |
| LU-1-3 Control drying parameters | **The learner will be able to**:<br>• control wet ink on sheets through proper drying chemicals,<br>• control wet ink on sheets through proper drying powders.<br>• unload low stacks from the machine as per SOPs. | **The learner will be able to**:<br>• define drying agents used in printing press,<br>• describe application of drying agents. | TH. 4 Hrs<br>PR. 4 Hrs | Offset printing machine<br>Scrapper | Class room and Press room lab/ industry |

Module B: **Maintain graphic chemicals in machine**

OverviewThis Competency Standard describes the performance outcomes, skills and knowledge required for an offset printing machine operator to maintain graphic chemicals by maintaining pH values, maintaining conductivity of chemical in the machine and maintaining temperature of chiller to obtain desired printing results. Underpinning knowledge, required for the Competency Standard is about characteristics of chemicals used in printing machine, e.g. pH value and conductivity. it is also essential for offset printing machine operator to understand how to maintain temperature of chiller of machine.

Duration: Total hours: 80 Theory: 10 Hrs.Practical 70 Hrs.

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU--21 Maintain pH value | **The learner will be able to**:<br>• keep pH value with in approved range,<br>• put pH value in log Book. | **The learner will be able to**:<br>• 1define pH value,<br>• give the importance of maintaining pH value during printing machine operations,<br>• list method of pH value measurement. | TH. 2 Hrs<br>PR. 16 Hrs | Offset printing machine<br>pH meter<br>Pen<br>Log book<br>Calibrated beaker | Class room and Press room lab/ industry |
| LU-2-2 Maintain conductivity | **The learner will be able to**:<br>• put in raw water conductivity value in log book,<br>• LO-6-2-2control raw water conductivity as per SOP,<br>• LO-6-2-3 put in water conductivity value in log book after control. | **The learner will be able to**:<br>• define conductivity in printing machine,<br>• define conductivity standard. | TH. 2 Hrs<br>PR. 12 Hrs | Offset printing machine<br>Conductivity meter<br>Calibrated beaker | Class room and Press room lab/ industry |
| LU-2-3 Maintain chiller temperature | **The learner will be able to**:<br>• put in water temperature value in log book, | **The learner will be able to**:<br>• define function of water temperature, | TH. 2 Hrs<br>PR. 12 Hrs | Offset printing machine<br>Thermometer | Class room and Press room lab/ industry |

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| | • control water temperature as per SOP. | • define water temperature standard. | | | |
| LU-2-4 Maintain water level in chiller tank | **The learner will be able to**:<br>• mix water with recommended chemical composition as per SOPs,<br>• maintain water quantity in chiller as per SOP. | **The learner will be able to**:<br>• discuss cause and effect of using recommended mix in machine instead of raw water<br>• describe water fountain system in offset printing machine,<br>• describe importance of chilled water in fountain system. | TH. 2 Hrs<br>PR.12 Hrs | Offset printing machine<br>Calibrated beaker | Class room and Press room lab/ industry |
| LU-2-5 Maintain IPA in water | **The learner will be able to**:<br>• put in IPA value after mixing in water in log book,<br>• control IPA value in water as per SOP. | **The learner will be able to**:<br>• define function of IPA.<br>• define behaviour of IPA after mixing in water. | TH. 1 Hrs<br>PR. 8 Hrs | Offset printing machine<br>Hygrometer<br>Calibrated beaker | Class room and Press room lab/ industry |
| LU-2-6 Maintain fountain solution in water | **The learner will be able to**:<br>• Maintain fountain solution in water as per SOPs,<br>• record fountain solution percentage in log book. | **The learner will be able to**:<br>• calculate ratio of fountain solution in water,<br>• describe the procedure of water chemical controlling in printing machine. | TH. 1 Hrs<br>PR. 10 Hrs | Offset printing machine<br>-pH meter | Class room and Press room lab/ industry |

Module C**: Develop professionalism**

**Overview:**: This module identifies the competencies required to develop professionalism in an offset printing machine operator in accordance with requirement of profession. A competent individual will be expected to participate in training institute level trainings, On Job Training (OJT), perform communication with others, upgrade professional skills and work in a team. This underpinning knowledge regarding development of professionalism will be sufficient to provide the basis for quality working.

Duration: Total hours: 40 Theory: 10 Hrs. Practical 30 Hrs.

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU-3-1 Participate in in-house training | **The learner will be able to**:<br>• identify latest training needs according to recent printing industry demands,<br>• get enrolled in advance press training course,<br>• follow training institutes policies for professional development,<br>• perform training task mentioned in TLM. | **The learner will be able to**:<br>• keep in touch with press training providers,<br>• apply press room mathematical skills during training,<br>• apply technical English skills during training,<br>• describe the importance of being a good team player,<br>• identify TLM/curriculum. | TH. 2 Hrs<br>PR. 6 Hrs | -Press room training workshop tools and equipment<br>Training provider's prospectus<br>TLM | Class room and Press room lab/ industry |
| LU-3-2 Participate in outdoor training | **The learner will be able to**:<br>• promote Kaizen in printing industry,<br>• implement 5S's at work place,<br>• maintain schedule chart according to organizational policies,<br>• provide logistic support for press room machinery during maintenance. | **The learner will be able to**:<br>• describe importance of Industrial Kaizen,<br>• identify press room Key Performance Indicators(KPIs)<br>• state importance and methods of time management,<br>• describe housekeeping through check sheet. | TH. 2 Hrs<br>PR. 6 Hrs | Tool and equipment available on job place<br>Kaizen suggestion format<br>Schedule chart<br>5S's check sheet | Class room and Press room lab/ industry |

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|---|---|---|---|---|---|
| LU-3-3 Attend trade shows, workshop, seminars | **The learner will be able to**:<br>• adopt upcoming market trends in printing trade by attending workshop and seminar,<br>• participate in skill test for professional development with concentration,<br>• participate in skill up-gradation courses with devotion,<br>• participate in professional seminars with concentration to acquire first hand industrial knowledge,<br>• participate in industrial visits on schedule,<br>• consult senior experts to get advised,<br>• watch videos/documentaries related with printing and packaging industry,<br>• perform internet browsing related to printing industry. | **The learner will be able to**:<br>• describe the benefits of latest machining techniques and developments,<br>• identify the need of skill sets by getting involved in seminars,<br>• read books/magazines related with mechanical manufacturing trade. | TH. 2 Hrs<br>PR. 6 Hrs | Computer with internet<br>Telephone<br>Journals<br>Books<br>Magazines<br>Survey templates<br>Research papers | Class room and Library |
| LU-3-4 Utilize internet | **The learner will be able to::**<br>• ensure format or structure of the correspondence is according to company's practice,<br>• browse website as per desire,<br>• download related software as per desire,<br>• Perform required communication via internet with in specified time limits. | **The learner will be able to:**:<br>• describe procedure of creating E-mail account,<br>• describe browsing techniques to find appropriate web site,<br>• describe procedure of sending E-mail,<br>• identify internet browsing/search engine,<br>• describe short keys for MS office. | TH. 2 Hrs<br>PR. 6 Hrs | Computer set with internet | Class room and Press room lab/ industry |

| | | | | | |
|---|---|---|---|---|---|
| LU-3-5 Prioritize job schedule | **The learner will be able to:**:<br><br>• interpret production plan as per supervisor's instruction,<br>• create daily schedule according to priority of production plan,<br>• comprehend material priorities for hindrance less production,<br>• develop list of required tools for hindrance less production,<br>• calculate time required for production,<br>• determine sequence of activities,<br>• report delays to superior in prescribed manners. | **The learner will be able to:**:<br><br>• define production plan,<br>• give advantages of preparation of production plan. | TH. 2 Hrs<br><br>PR. 6 Hrs | Computer set with internet<br><br>Log book | Class room and Press room lab/ industry |

Module D: **Perform communication**

**Overview:**:This module refers to the development of skills and competencies to perform communication. It also deals with listening practice, adopting questioning technique to lead actual issues in the system, demonstrating telephonic ethics and moral techniques to deal with people related to the work.

Duration: Total hours: 40 Theory: 10 Hrs.Practical 30 Hrs.

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU-4-1 Make telephone calls | **The learner will be able to:**:<br>• determine communication styles,<br>• investigate issue /problem through relevant questions,<br>• demonstrate courteous behavior while listen to the people,<br>• perform phone conversation applying time management concisely. | **The learner will be able to:**:<br>• concentrate on commands/speeches, record information about enquiry or complaint as per<br>• company's practice. | TH. 2 Hrs<br>PR. 4 Hrs | Telephonic system | Class room and Press room lab/ industry |
| LU-4-2 Instruct labors | **The learner will be able to:**:<br>• display body language while communicating to a customer to show attention,<br>• communicate within department as per SOPs.<br>• opt language for commanding. | **The learner will be able to:**:<br>• identify factors required to communicate effectively and precisely within same organization,<br>• explain elements required to deal with vendors and the other organizations,<br>• describe the methods to overcome the sentiment, | TH. 2 Hrs<br>PR. 4 Hrs | Workshop Ethical poster | Class room and Press room lab/ industry |

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| | | • use language which labor could understand elegantly. | | | |
| LU-4-3 Communicate with supervisor | **The learner will be able to:**:<br>• develop a strategy for using communication skills,<br>• convey ideas to the supervisor precisely,<br>• report safety hazards to supervisor urgently,<br>• maintain good working relation with supervisor. | **The learner will be able to:**:<br>• learn & monitor use of your communication skills, adapting your strategy as necessary, to produce the quality of outcomes required,<br>• describe the importance of accurate communication,<br>• write work reports,<br>• fill indent form,<br>• maintain work history. | TH. 2 Hrs<br>PR. 4 Hrs | - Telephone system<br>- Log book | Class room and Press room lab/ industry |
| LU-4-4 Maintain relations with people | **The learner will be able to:**:<br>• communication with other departments,<br>• communicate effectively with colleagues, peers, the community, other related personals to exchange information,<br>• interact with other professionals through effective teamwork,<br>• enlist names and address of printing press related people and organization. | **The learner will be able to:**:<br>• give advantages of maintaining good occupational relations with printing industry people. | TH. 2 Hrs<br>PR. 4 Hrs | Office stationary | Class room and Press room lab/ industry |

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU-4-5 Perform E-mail communication | **The learner will be able to:**:<br>• interpret E-mail received on personal E-mail address,<br>• prepare E-Mail for vendor applying E-mail writing ethics,<br>• send E-mail to vendor enclosed with picture of print design. | **The learner will be able to:**:<br>• express steps of creating new e-mail account,<br>• state e-mail writing ethics,<br>• state method of e-mail sent confirmation. | TH. 2 Hrs<br>PR. 4 Hrs | Computer set with internet | Class room and Press room lab/ industry |

Module E**: Manage press room waste**

**Overview:**:This module identifies the competencies required to manage waste of printing press. A competent individual will be expected to manage paper and other solid waste, liquid waste, toxic and non-toxic waste. This includes underpinning knowledge regarding waste management in printing press.

Duration: Total hours: 50Knowledge: 10 Hrs.Practical 40 Hrs.

| Learning Unit | Learning Outcomes | Learning Elements | Duration | Materials (Tools & Equipment) Required | Learning Place |
|---|---|---|---|---|---|
| LU-5-1 Manage printing press waste | **The learner will be able to:**:<br>• sort the waste generated at the workplace according to usability,<br>• tag the reusable components/item of the waste,<br>• maintain record of reusable components of the waste,<br>• segregate the scrap according to material properties,<br>• follow safety precautions related to waste handling,<br>• reduce the waste generation in routine work by reuse the categorized waste as per requirement,<br>• handle hazardous waste according to SOPs. | **The learner will be able to:**:<br>• list printing press waste,<br>• define safety precautions to manage printing waste,<br>• state method of printing press waste control. | TH. 2 Hrs<br>PR. 12 Hrs | Tagging machine<br>Waste bin | |

| | | | | | |
|---|---|---|---|---|---|
| LU-5-2 Handle toxic chemicals | **The learner will be able to:**<br>• tag containers of toxic chemical as per SOPs,<br>• store toxic waste at place designated for toxic waste as per printing press SOPs,<br>• manage Inflammable toxic chemical waste as per printing press SOPs,<br>• manage non- inflammable toxic chemical waste as per printing press SOPs. | **The learner will be able to:**<br>• define toxic chemical in printing press,<br>• list toxic chemical used in printing press,<br>• describe procedure of toxic chemical management. | TH. 2 Hrs<br>PR. 8 Hrs | Tagging machine Toxic chemical waste container | Class room and Press room lab/ industry |
| LU-5-3 Handle non-toxic chemicals | **The learner will be able to:**<br>• tag containers of non-toxic chemical as per SOPs,<br>• store nontoxic waste at place designated-to toxic waste as per printing press SOPs,<br>• dispose of inflammable non-toxic chemical waste as per printing press SOPs,<br>• dispose of non- inflammable non-toxic chemical waste as per printing press SOPs. | **The learner will be able to:**<br>• list common non-toxic waste in printing press,<br>• state procedure of non-toxic waste disposal without affecting environment. | TH. 2 Hrs<br>PR. 4 Hrs | Tagging machine Liquid dispose of container | |

| | | | | | |
|---|---|---|---|---|---|
| LU-5-4 Handle paper waste | **The learner will be able to:**:<br>• sort paper waste according to disposable categories,<br>• put paper waste in waste papers container as per printing press SOPs,<br>• store paper waste container at place designated to this purpose. | **The learner will be able to:**:<br>• discuss advantages of storing waste papers storage,<br>• state procedure of paper waste disposal without affecting environment. | TH. 2 Hrs<br>PR. 12Hrs | - Waste papers container | |
| LU-5-5 Manage solid waste | **The learner will be able to:**:<br>• sort solid waste according to disposable categories,<br>• put solid waste in waste bin as per printing press SOPs,<br>• store solid waste bin at place designated-to this purpose. | **The learner will be able to:**:<br>• list common routine solid waste in printing press,<br>• state procedure of solid waste of printing press disposal without affecting environment. | TH. 2 Hrs<br>PR. 4 Hrs | -Waste Bin | |

## 4- List of tools (for standard class of 25learner) (Annexure – I)

| Sr. | Description | Specification | Quantity |
|---|---|---|---|
| 1. | Allen key set | Complete set | 2 |
| 2. | Calibrated beaker | Standard (when multi-color machine is installed) | 2 |
| 3. | Calibrated or packing sheet (Offset sheets) | As per machine specs | One packet (100 sheets) |
| 4. | Cleaning Brush | Regular cloth washing brush | 4 |
| 5. | Correcting brush | Standard # 3 | 4 |
| 6. | Din cup | Standard 4mm | 1 |
| 7. | Docket | 20”x30” large envelops or Box | 15 |
| 8. | Dust bin | Large size 2 units | 4 |
| 9. | Eye/magnifying glass | 8 TO 10X | 2 |
| 10. | Fixed spanner set | Complete set | 2 |
| 11. | Grease gun | With Complete nozzle set | 2 |
| 12. | Grip pliers | Standard | 2 |
| 13. | Lock pliers | Set | 2 |
| 14. | Micro meter | Standard | 2 |
| 15. | Pliers set | standard complete set of 4 pcs | 2 |
| 16. | Pre-piling stand | 40” heavy duty table | 2 |
| 17. | Punch set | Complete set | 2 |
| 18. | Ratchet set | Complete set | 2 |
| 19. | Screw driver set | Complete set | 2 |
| 20. | Spaggle/ scraper (Chansa) | Plastic / metal | 40 |
| 21. | Torque wrench | Complete set | 1 |
| 22. | Steel ruler | 36” | 4 |
| 23. | Thermometer | Standard to monitor room temperature | 2 |
| 24. | Tommy Bar | Complete set one specific size which usually came with machine | 2 |
| 25. | Vernier calipers | Standard | |

| | | | |
|---|---|---|---|
| 26. | Waste trolley | 2-3 FT Height Blue drums, 3 units | 02 |

## 5- **List of machinery & equipment (for standard class of 25 learners)**

| Sr. | Description | Specifications | Quantity |
|---|---|---|---|
| 1. | Computer set with Internet | Desktop 3+Ghz, 3+GB RAM, 17+inch Display , internet | 26Sets |
| 2. | Multimedia set | 3000LUM, 6' x 8' foldable screen | 01 |
| 3. | ph/ Conductivity meter | STANDARD- Preferable HANNA | 02 |
| 5. | Hygro- meter | Standard 0-100% | 02 |
| 6. | Hydromet /Humidity meter | 10 to 95 % RH | 02 |
| 7. | Light booth | D50 lights | 01 |
| 8 | MULTICOLOR OFFSET PRINTING MACHINE IF REQUIRED<br><br>(HEIDELBERG: RECOMMENDED BY NQDC) | SM 74-2 (size)**(with all related tools as per mentioned at Annexure – I)**<br>CPC-control Register integrated, Alcolor, Auto plate, Baldwin dampening<br>circulation and cooling, ink unit washing device, blanket cylinder washing<br>device, plate cylinder chromed, Non Stop pile feeder, double sheet control,<br>pull guide control, Non Stop delivery rake, sheet decurler, powder device | 02 |
| 9 | Paper weighing machine | standard | 01 |
| 10 | Multifunction Printer | A3 size | 01 |
| 11 | Spectrophotometer (Xrite/ Techkon: recommended by NQDC) | ADVANCE SPECS | 01 |

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