PUNJAB AGRICULTURAL UNIVERSITY, LUDHIANA
ADVERTISEMENT NO.04/2020

Applications are invited from the eligible candidates for the following posts on the prescribed form. The candidates can download the prescribed **application forms** for these posts from the link given on PAU Website (www.pau.edu). The application forms are also obtainable from **the concerned offices mentioned against each post** on any working day **from 10.00 a.m. to 4.00 p.m**. **by 01.02.2021**. **The requisite fee can be deposited through electronic mode or in shape of bank draft (see Annexure-1). Bank draft should be in favour of Comptroller PAU, Ludhiana payable at Ludhiana.** The candidates may submit the duly filled/completed application forms (along with detailed qualifications, experience, self-attested testimonials, summary of qualifications and all other relevant documents) with proof of deposit of requisite fee in the respective offices in University as per details given below. **The last date of receipt of application forms will be 01.02.2021.**

S.No.	Name of the post	Cost of Application form	Fee to be attached with the application form	Name of office where forms are available
1.	Additional Director of Research(Crop improvement)-cum-Director, Dr Gurdev Singh Khush Institute of Genetics, Plant Breeding & Biotechnology	300.00	800.00	% Registrar
2.	Deputy Director (Training) (At Outstation)	300.00	600.00	% Registrar
3.	Biotechnologist	300.00	500.00	% Registrar
4.	Wheat Breeder	300.00	500.00	% Registrar
5.	Forage Breeder	300.00	500.00	% Registrar
6.	Rice Breeder	300.00	500.00	% Registrar
7.	Entomologist (Rice)	300.00	500.00	% Registrar
8.	Soil Chemist	300.00	500.00	% Registrar
9.	Extension Scientist	300.00	500.00	% Registrar
10.	Scientist (Food Microbiology)	300.00	500.00	% Registrar
11.	Assistant Professor (Soil & Water Engg.)	300.00	500.00	% Registrar
12.	Scientist (Processing & Food Engineering)	300.00	500.00	% Registrar
13.	Assistant Professor (Mechanical Engineering)	300.00	500.00	% Registrar
14.	Assistant Professor (Apparel & Textile Science)	300.00	500.00	% Registrar
15.	Scientist (Apparel & Textile Science)	300.00	500.00	% Registrar
16.	Plant Pathologist (Potato Seed Production) (At Outstation)	300.00	500.00	% Registrar
17.	Plant Breeder (At Outstation)	300.00	500.00	% Registrar
18.	Agricultural Economist (At Outstation)	300.00	500.00	% Registrar
19.	Assistant Professor (Home Science) at KVK (At Outstation)	300.00	500.00	% Registrar
20.	Technical Assistant (Engg.)	200.00	300.00	% Director of Research
21.	Laboratory Attendant (PAU Hospital)	200.00	300.00	% Registrar

Pay Scales of Posts:

Sr. No. 1	Rs.37400-67000+AGP Rs.10000/-p.m.+ Rs. 800/- p.m. Special Allowance
Sr. No. 2	Rs. 37400-67000+AGP Rs.9000/-p.m.
Sr. No. 3 to 19	Rs. 15600-39100+AGP Rs. 6000/-p.m.
Sr. No. 20	Rs. 5200-20200+GP Rs. 2800/- p.m.
Sr. No. 21	Rs. 5910 -20200+GP Rs.1900/- p.m.

Note: The candidates who have applied for the post at Sr. No. 2 in response to Advt. No.02/2020 may apply afresh.

Important

1. Applications, which are incomplete/ not on the prescribed form/ received after the last date/ received without prescribed application fee shall not be considered. **The University shall not be responsible for any postal delay or loss in transit.**

2. Post at Sr. No. 1 & 2 are tenurial posts for a term of 4 years.

3. The candidates who have already applied for the post at Sr. No. 15 advertised vide advertisement No. 03/2019 need not apply again. However, they can provide additional information, if any, with respect to their application submitted earlier.

4. In service candidates should apply through proper channel.

5. **Appointment for posts at Sr. No. 2, 10, 18, 19 & 20** shall be co-terminus with the scheme in which these are provided.

6. **For posts at Sr. No. 3 to 19** only short-listed candidates will be called for interview.

7. **For posts at Sr. No. 1 to 21**, the minimum age of entry is 18 years and retirement age is 60 years.

8. **For post at Sr. No. 20** & 21 age not less than 18 years and not more than 37 years as on **1.1.2021.**

9. Reservation and relaxation in age will be applicable as per Punjab Government policy.

10. The upper age limit will be relaxed maximum up to 45 years in the case of persons already in employment of the Punjab Government/other state government or the Government of India, wherever applicable.

11. As per decision of Board of Management vide notification No.14353 dated 30.10.2018 the relaxation in age will be maximum up to 45 years for the employees who have been engaged in University on contract basis for applying to the non-teaching posts (as per notification No.GSR.33/Const./ART 309/94 dated 4.5.1994 by the Punjab Govt.). The relaxation in age will be equivalent to period for which the employee has served PAU/Govt. organizations/Boards/Corporations on contract basis.

12. The candidate must fulfil the requisite qualifications by the last date of receipt of applications i.e. **01.02.2021.**

13. **For Post at Sr. No. 2 to 21:** 4% of the posts are reserved for physically handicapped persons belonging to Punjab state with 40% or more disability and the breakup of this reservation is as under:-

i)	Blindness and low vision	:	1%
ii)	Deaf and Hard of Hearing Impairment	:	1%
iii)	Locomotor disability (including Cerebral palsy, Leprosy cured, Dwarfism, Acid attack victims and Muscular dystrophy)	:	1%
iv)	Intellectual disability (including Autism and Specific learning disability), and Mental illness;	:	1%

<div align="center">OR</div>

Multiple disabilities specified in Serial No. 1 to 4 above,
including deaf-blindness.

Attested copies of the Certificates regarding proof of handicapped and extent thereof, issued by Civil Surgeon of the district or place of which applicant is a permanent resident should be attached. <u>It would also be certified in the medical certificate that the applicant is otherwise fit for the post he/she is applying for.</u> However, if eligible persons are not found available in response to this advertisement, the posts will be filled out of other category/ categories and the points meant for persons with disabilities shall be carried forward for being filled from future vacancies.

14. **While making any correspondence with reference to the above recruitment, the candidate must mention his/her contact number and e-mail Address.**

15. **All the candidates should attach photo copies of their qualifications(Detail Marks Cards), experience, reservation claiming documents and other relevant documents failing which no mark(s) (wherever applicable) will be awarded to them and they can also be declared ineligible for the post in absence of these documents.**

16. **<u>Pay scales and other service conditions for the above posts wherever applicable will be governed as per Punjab Government's notification No.7/204/2012-4FP1/60 dated 15.1.2015 and circular No.7/204/2012-4FP1/66 dated 15.1.2015 and any other instructions issued by Punjab Government from time to time in this regard.</u>**

17. The corrigendum/addendum, if any, will be issued on our website (www.pau.edu) only.

18. **All the updates and notices regarding non-teaching posts will be uploaded on the website www.pau.edu. Thus the candidates are advised to visit the website on regular basis. No separate information be sent through post or other means. Any information uploaded on the above mentioned website will be deemed to have reached the candidates and responsibility for not visiting the site and responding thereto in time, will be entirely of the candidates.**

19. Though every care has been taken, yet any mistake crept inadvertently is subject to correction.

Registrar
Punjab Agricultural University

Detail of requisite fee to be deposited through Electronic Mode or by Demand Draft as under

S. No.	Sr. Nos. of the posts	(A) Cost of application form	(B) Fee to be deposited with form	(C) Total fee
1.	Sr. No. 1	300.00	800.00	1100.00
2.	Sr. No.2	300.00	600.00	900.00
3.	Sr. No.3 to 19	300.00	500.00	800.00
4.	Sr.20 to 21	200.00	300.00	500.00

1.	Name of the Bank	:	Bank of Baroda	
2.	Branch	:	PAU, Ludhiana	
3.	Account name	:	Comptroller PAU (Recruitment)	
4.	Account No.	:	29380100017259	
5.	IFSC code	:	BARB0PAULUD	

OR

By Demand draft in favour of Comptroller, PAU, payable at Ludhiana

Note:

1. **Those candidates who will download the application forms from the University website (www.pau.edu) should submit the total fee mentioned at column (C) in the above table.**
2. **Those candidates who will purchase the application form by cash from the respective offices of the University, should submit the requisite fee mentioned at column (B) in the above table either through Electronic Mode or through Bank Draft.**

1.   **Additional Director of Research (Crop Improvement)-cum-Director, Dr Gurdev Singh Khush Institute of Genetics, Plant Breeding & Biotechnology in the scale of Rs.37400-67000 + AGP Rs.10,000/- + Rs.800/- p.m. special allowance.**

   i)   B.Sc. (Agri.)/B.Sc. (Biotech.)/B.Sc. (Med.)/B.Sc (Hons.) in Biological Sciences.

   ii)   Ph.D. in Plant Breeding/Genetics/Plant Breeding and Genetics/ Biotechnology/Seed Technology.

<div align="center">**OR**</div>

      (a) Ph.D. in Botany/ Biochemistry.
      (b) Major Research work related to crop improvement.

   iii)   <u>At least Second division at Bachelor's level</u> and 65% marks or OCPA of 6.50 out of 10.00 at Master's level.

   (iv)   12 years' experience in research/ teaching/ extension in relevant discipline in college/institution out of which at least 5 years must be as Professor/equivalent. Administrative experience, leadership, ability and capacity to organize and supervise the work of others.

   v)   Matric level certificate of Punjabi language of Punjab School Education Board or any other equivalent. (If not, the candidate is required to pass the same within one year of appointment).

Desirable:

   i)   Experience in Plant Breeding/Genetics/Biotechnology/Seed Technology

   ii)   Administrative experience.

Job Responsibilities :

   i)   To assist the Director of Research in planning, monitoring and coordinating scientific research on various aspects relating to Crop Improvement and IPR across the colleges in PAU Campus and outstations.

   ii)   To motivate faculty to write new research projects, to scrutinize the submitted research projects and to review the synopses of P.G. Students relating to crop improvement.

   iii)   To compile information for the research reports on crop improvement.

   iv)   To perform such other duties as entrusted by the Director of Research from time to time.

2. **Deputy Director (Trg.) at KVKs in the pay scale of Rs. 37400-67000 + AGP Rs. 9000/- for the tenure of four years.**

   i). B.Sc. (Agri.)/B.Sc. (Hort.)/B.Sc. (Forestry)/B.Sc.(Med.)/B.Sc.(Hons.).
   ii). Ph.D. degree in any branch of Agriculture and allied science/discipline.
   iii). At least 60% marks at Bachelor level and 65% marks or OCPA of 6.50 out of 10.00 at Master's level.
   iv). Eight Years' experience in teaching/research/extension education in therelevant area at the level of Assistant Professor or equivalent. (The periodspent in obtaining Ph.D. degree while in service or otherwise will not be counted towardsexperience for recruitment).
   v). Substantial contributions to research/extension and scholarship as evidenced by the quality of research/extension papers published. The candidate has published up to 4 research papers with cumulative NAAS rating not less than 12 and 16 good quality extension articles.
   Vi) Matric level certificate of Punjabi language of Punjab School Education Board or any other equivalent. (If not, the candidate is required to pass the same within one year of appointment).

Job Responsibilities:

   i) To undertake extension/research/teaching activities.
   ii) To take initiative for development/developing research projects to obtain funding.
   iii) Any other duty that may be assigned from time to time.

Note 1: The appointment to this post shall be co-terminus with the scheme, in which the post is provided.

Note 2: The post is for the tenure of four years and the candidate is eligible for maximum three terms of four years each as per decision taken by the BOM in its 297th meeting held on 19.06.2020 (copy enclosed.)

Note 3: The candidates who have applied for the post of Deputy Director (Trg.) in response to Advt. No.02/2020 may apply afresh for this post. The fees already paid for Advt. No.02/2020 will be refunded shortly.

3. Biotechnologist in the pay scale of Rs. 15600-39100+ AGP Rs. 6000/-.

i). B.Sc/B.Sc(Agri.)/B.Sc. Biotechnology/B.Sc Biotechnology in Plant Sciences /B.Tech Biotechnology in Plant Sciences/

ii). Master's degree in Biotechnology/Genetics/Plant Breeding/Life Sciences with specialization of Plant Biotechnology.

iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.

iv). Must have qualified National Eligibility Test (NET) in the relevant disciplines conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

v). Matric level certificate of Punjabi language from Punjab   School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in these disciplines shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009
OR

- The candidate completed Ph.D without   course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.
OR
The candidate has minimum 3 research papers, each with at least NAAS rating of 4.5 or with Clarivate Analytics (CA) impact factor.

Note 3: In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation /Bachelor's level except degree in Basic Sciences and social sciences discipline.

- The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Note: 6 The candidates who have done B.Sc. (Biotechnology) in Plant Sciences/B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses of bachelor's degree in relevant subjects during their master's degree.

Job Requirements:
   i) To undertake research/teaching/extension education activities.
   ii) To take initiative for developing research projects to obtain funding.
   iii) Any other duty that may be assigned from time to time.

4.   Wheat Breeder in the pay scale of Rs.15600-39100+AGP Rs.6000/-.

   i).   B.Sc(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc(Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences/B.Sc (Med.)
   ii).   Master's degree in Plant Breeding/ Plant Breeding & Genetics/ Genetics (Crop Plants).
   iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
   iv).   Must have qualified National Eligibility Test (NET) in any of the disciplines mentioned at Sr. No.ii) above conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
   v).   Matric level certificate of Punjabi language from Punjab   School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1:   A candidate, who does not possess Master's degree in the discipline mentioned at Sr. No.ii) but possesses Ph.D. degree in any of these disciplines shall be eligible for the post**.**

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009
                                         OR
   -    The candidate having completed Ph.D   without   course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

      -    The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor**.**
                   OR
           The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
Note 3:   In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation /Bachelor's level except degree in Basic Sciences disciplines**.**
      - The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.
      -    The candidates who have done B.Sc. (Biotechnology) in Plant Sciences/ B.Tech Biotechnology in Plant Sciences should have cleared deficiency courses of bachelor's degree in relevant subject(s) during their master's degree.

Job Requirements:
   i)   To undertake research/teaching/extension education activities.
   ii)   To take initiative for developing projects and to obtain funding.
   iii) Any other duty that may be assigned from time to time.

5.   **Forage Breeder in the pay scale of Rs.15600-39100+AGP Rs.6000/-.**

i).   B.Sc(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc(Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences/B.Sc (Med.)

ii).   Master's degree in Plant Breeding/ Plant Breeding & Genetics/ Genetics (Crop Plants).

iii).   At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.

iv).   Must have qualified National Eligibility Test (NET) in any of the disciplines mentioned at Sr. No.ii) above conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

v).   Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1:   A candidate, who does not possess Master's degree in Plant Breeding & Genetics/ Genetics (Crop Plants) but possesses Ph.D. degree in these disciplines shall be eligible for the post**.**

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009

                            OR

-     The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

-     The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor**.**

                OR

The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3:   In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation /Bachelor's level except degree in Basic Sciences disciplines**.**

- The candidates who have completed Bachelor degree in 3 years should have cleared deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

- The candidates who have done B.Sc. (Biotechnology) in Plant Sciences/ B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses of bachelor's degree in relevant subject(s) during their master's degree.

Job Requirements:

i)   To undertake research/teaching/extension education activities.

ii)   To take initiative for developing research projects and to obtain funding.

iii)   Any other duty that may be assigned from time to time.

6.   Rice Breeder in the pay scale of Rs.15600-39100+AGP Rs. 6000/-.

 i). B.Sc(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc(Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences/B.Sc (Med.)

 ii). Master's degree in Plant Breeding/ Plant Breeding & Genetics/ Genetics (Crop Plants).

 iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.

 iv). Must have qualified National Eligibility Test (NET) in any of the disciplines mentioned at Sr. No.ii) above conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

 v). Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1: A candidate, who does not possess Master's degree in Plant Breeding, Plant Breeding& Genetics/ Genetics (Crop Plants) but possesses Ph.D. degree in these disciplines shall be eligible for the post**.**

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009
   OR
- The candidate completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

 - The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor**.**
   OR
The candidate has minimum 3 research papers, each with at least 4.5 NAAS or with Clarivate Analytics (CA) impact factor.

Note 3: In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation /Bachelor's level except degree in Basic Sciences disciplines**.**
 - The candidates who have completed Bachelor degree in 3 years should have cleared deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.
 - The candidates who have done B.Sc. (Biotechnology) in Plant Sciences/B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses of bachelor's degree in relevant subjects during their master's degree.

Job Requirements:
 i) To undertake research/teaching/extension education activities.
 ii) To take initiative for developing research projects and to obtain funding.
 iii) Any other duty that may be assigned from time to time.

7. **Entomologist (Rice) in the pay scale of Rs.15600-39100+ AGP Rs.6000/-**

- i). B.Sc. (Agriculture)/B.Sc. (Horticulture)/ B.Sc. (Forestry)/B.Sc (Medical)/B.Sc. (Hons) /B.Sc. Biotechnology in Plant Sciences/B.Tech. Biotechnology in Plant Sciences.
- ii). Master's degree in Entomology.
- iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
- iv). Must have qualified National Eligibility Test (NET) in any of the disciplines mentioned at Sr. No. ii) above conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
- v). Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language). (If not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in Entomology but possesses Ph.D. degree in the discipline shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET, provided, it has been done with course work as prescribed by the UGC regulations 2009.

OR

- The Candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and
- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

OR

- The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level except degree in Basic Sciences disciplines.

- The candidates who have completed Bachelor degree in 3 years should have cleared deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.
- The candidates who have done B.Sc. Biotechnology in Plant Sciences/B.Tech. Biotechnology in Plant Sciences should have cleared deficiency courses of bachelor's degree in relevant subject(s) during their master's degree.

Job Requirements:
- i) To plan and conduct experiments related to the field of Rice Crops as per objectives of the scheme.
- ii) To take initiative for developing research projects and to obtain funding.
- iii) Any other duty that may be assigned from time to time.

8.   **Soil Chemist in the pay scale of Rs. 15600-39100+ AGP Rs. 6000/-.**

   i)   B.Sc. (Agri.)/ B.Sc (Hort.)/B.Sc(Forestry)/B.Sc.
   ii)   Master's degree in Soil Science.
   iii) At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.00atMaster's level.
   iv)   Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics impact factor.
   v)   Matric level certificate of Punjabi language of Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

Note 1:   A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

                                    OR

   -    Thecandidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted form NET, and

   -    The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.
                                    OR
   -    The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3:   In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level except degree in Basic Science & Social Science discipline.

   -    The candidate who have completed Bachelor degree in 3 years should have cleared their deficiency course in relevant subjects of bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Job Requirements:

   i) To undertake research/ teaching/extension education activities.

   ii) To take initiative for developing research projects to obtain funding.

   iii) Any other duty that may be assigned from time to time.

        The appointment to this post shall be co-terminus with the scheme, in which the post is provided.

9. **Extension Scientist in the pay scale of Rs.15600-39100+ AGP Rs.6000/-.**

   i).   B.Sc.(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc (Home Science)/B.Sc (Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences

   ii).   Master's degree in Agricultural Extension/ Extension Education.

   iii).   At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.

   iv).   Must have qualified National Eligibility Test (NET) in any of the abovementioned disciplines mentioned at Sr. No. ii) conducted by ICAR/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

   v).   Must have passed Matric level certificate of Punjabi language from PunjabSchool Education Board or any other recognized Board (as first or second language).

Note 1:   A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

-    The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

-    The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

OR

-    The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3:   In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level except degree in basic science and social science disciplines.

-    The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Note 6:   The candidate who have done B.Sc. (Biotechnology) in Plant Sciences/B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses ofbachelor's degree in relevant subject (s) during their master's degree.

Job Requirements:
   i)   To undertake extension education/research/teaching/ activities.
   ii)   To take initiative for developing research projects to obtain funding.
   iii)   Any other duty that may be assigned from time to time.

10.   **Scientist (Food Microbiology) in the pay scale of Rs. 15600-39100+AGP Rs 6000/-**

   i)   Bachelor degree in Science.

   ii)   Master's degree in Microbiology.

   iii)   At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.

   iv)   Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with atleast 4.5 NAAS rating or with Clarivate Analytics Impact factor.

   v)   Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1:   A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

\-   The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET,**and**

\-   The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.
OR
\-   The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3:   In case of non-NAAS rated papers, Clarivate Analytics (CA) Impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level.

\-   The candidate who have completed B.Sc in 3 years should have cleared their deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Job Responsibilities:

   i) To undertake research/ teaching/extension education activities.

   ii) To take initiative for developing research projects to obtain funding.

   iii) Any other duty that may be assigned from time to time.

11. **Assistant Professor (Soil & Water Engineering) in the pay scale of Rs.15600-39100+AGP Rs.6000/- .**

i) Bachelor's degree in Agricultural Engineering/Civil Engineering.
ii) Master's degree in Soil & Water Engineering.
iii) At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.00 at Master's level.
iv) Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Thomson Reuter's impact factor.
v) Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

- The candidate completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted form NET, and
-
- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.
OR
- The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of non-NAAS rated papers, Thomson Reuters (TR) impact factor journals will be considered as NAAS rated with rating of 6+TR impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level.

- The candidate who have completed Bachelor degree in 3 years should have cleared their deficiency course in relevant subjects of bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Job Requirements:

i) To undertake teaching/research/extension education activities.

ii) To take initiative for developing research projects to obtain funding.

iii) Any other duty that may be assigned from time to time.

12. **Scientist (Processing & Food Engineering) in the pay scale of Rs.15600-39100+ AGP Rs. 6000/-.**

i) Bachelor of Engineering or Technology in Agricultural Engineering /Mechanical/ Chemical/Electrical/Food Engineering/Food Technology/Dairy Technology/B.Sc. Food Technology (Hons.).
ii) M.Tech in Processing & Food Engineering/Post Harvest Engineering/ Processing & Agricultural Structures.
iii) At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
iv) Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/ UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics impact factor.
v) Matric level certificate of Punjabi language of Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

- The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted form NET, and

- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0.
OR

- The candidate has minimum 3 research papers, each with at least NAAS rating of 4.5.

Note 3: In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor Level except degree in Basic Science & Social Science discipline.

- The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects of Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Job Responsibilities:

i) To undertake Research/Teaching/ extension education activities.
ii) To take initiative for developing projects and to obtain funding.
iii) Any other duty that may be assigned from time to time.

13. **Assistant Professor (Mechanical Engineering) in the pay scale of Rs.15600-39100 + AGP Rs.6000/-.**

    i) Bachelor's degree in Mechanical Engineering/Mechatronics.
    ii) Master's degree in Mechanical Engineering with specialization in Mechatronics.
<div align="center">Or</div>

    Master's degree in Mechatronics
    iii) At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
    iv) Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating (highest NAAS rating of the journal during the last 5 years to be taken) or with Clarivate Analytics Impact factor.
    v) Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

    Desirable: Degree in Mechatronics.

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009
<div align="center">**OR**</div>

- The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, **and**
- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 rating (highest NAAS rating of the journal(s) during the last 5 years to be taken)
<div align="center">**OR**</div>

The candidate has minimum 3 research papers, each with at least NAAS rating of 4.5 rating (highest NAAS rating of the journal(s) during the last 5 years to be taken)

Note 3: In case of non-NAAS rated papers Clarivate Analytics (CA) Impact Factor journals will be considered as NAAS rated with rating of 6+ CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The condition having qualified National Eligibility Test (NET) at Sr. No. (iv)will be relax-able in the subject of Mechanical Engineering, Mechatronics or related subjects.

Note6: - The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level.
- The candidate who have completed Bachelor degree in 3 years should have cleared their deficiency course in relevant subjects of bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Job Requirements:
    i) To undertake teaching/ research/extension education activities.
    ii) To take initiative for developing research projects to obtain funding.
    iii) Any other duty that may be assigned from time to time.

14.   Assistant Professor (Apparel & Textile Science) in the pay scale of Rs.15600-39100 +AGP Rs.6000/-.

  i). B.Sc. (Hons) Home Science/Community Science/Fashion Designing.
  ii). M.Sc. in Clothing and Textile/Apparel and Textile Science/Fashion Designing.
  iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
  iv). Must have qualified National Eligibility Test (NET) in the above mentioned disciplines conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
  v). Matric level certificate of Punjabi from Punjab School Education Board or any recognized Board/Agency (as first or second language). (If not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009

           OR

- The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

           OR

- The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level.

- The candidates who have completed Bachelor degree in 3 years should have cleared deficiency courses in relevant subjects of Bachelor's degree during their Master's degree.

Note: 6 The candidates who have done B.Sc Home Science in five years after Matric or B.Sc Fashion Designing in 3 years after 10+2 prior to 2015 are also eligible to apply.

Job Responsibilities:

  i) To undertake teaching/research/extension education activities.
  ii) To take initiative for developing research projects and to obtain funding.
  iii) Any other duty that may be assigned from time to time.

15. **Scientist (Apparel and Textile Science) in the pay scale of Rs.15600-39100+AGP Rs. 6000/- .**

   i). B.Sc. (Hons) Home Science/Community Science/Fashion Designing.
   ii). M.Sc. in Clothing and Textile/Apparel and Textile Science/Fashion Designing.
   iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
   iv). Must have qualified National Eligibility Test (NET) in the above mentioned disciplines conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
   v). Matric level certificate of Punjabi from Punjab School Education Board or any recognized Board/Agency (as first or second language). (If not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC Regulations 2009

OR

  - The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

  - The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

OR

  - The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of Non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level.

  - The candidates who have completed Bachelor degree in 3 years should have cleared deficiency courses in relevant subjects of Bachelor's degree during their Master's degree.

Note 6: The candidates who have done B.Sc Home Science in five years after Matric or B.Sc Fashion Designing in 3 years after 10+2 prior to 2015 are also eligible to apply.

Job Responsibilities:

   i) To undertake teaching/research/extension education activities.
   ii) To take initiative for developing research projects and to obtain funding.
   iii) Any other duty that may be assigned from time to time.

16. **Plant Pathologist (Potato Seed Production) (Outstation) in the pay scale of Rs.15600- 39100+ AGP Rs. 6000/-**

   i). B.Sc.(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc (Med.)/B.Sc (Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences.
   ii). M.Sc. in Plant Pathology.
   iii). At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.00 at Master's level.
   iv). Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
   v). Matric level certificate of Punjabi language of Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

- The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

OR

- The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5: The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level except degree in basic science and social science disciplines.

- The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Note 6: The candidates who have done B.Sc (Biotechnology) in Plant Sciences/B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses in relevant subject of Bachelor's degree during their Master's degree.

Job Requirements:
   i) To undertake research/teaching/extension education activities.
   ii) To take initiative for developing research projects to obtain funding.
   iii) Any other duty that may be assigned from time to time.

17.   **Plant Breeder (Outstation) in the pay scale of Rs.15600-39100+ AGP Rs. 6000/-.**

    i).   B.Sc.(Agri.)/B.Sc.(Horti)/B.Sc(Forestry)/B.Sc (Med.)/B.Sc (Biotechnology) in Plant Sciences/B.Tech Biotechnology in Plant Sciences
    ii).   Master's degree in Plant Breeding/Plant Breeding & Genetics/Genetics (Crop Plants).
    iii).   At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.0 at Master's level.
    iv).   Must have qualified National Eligibility Test (NET) in any of the abovementioned disciplines mentioned at Sr. No. ii) conducted by ICAR/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.
    v).   Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language). If not, the candidate is required to pass the same within one year of appointment.

Note 1:   A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

<div align="center">OR</div>

    -     The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and
    -     The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.

<div align="center">OR</div>

    -     The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3:   In case of non-NAAS rated papers, Clarivate Analytics (CA) impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation/Bachelor's level except degree in basic sciences.

    -     The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects Bachelor's degree during their Master's degree or should have completed one year duration Hons./Bridged/special programme etc.

Note 6:   The candidate who have done B.Sc. (Biotechnology) in Plant Sciences/B.Tech in Biotechnology in Plant Sciences should have cleared deficiency courses ofbachelor's degree in relevant subject (s) during their master's degree.

Job Requirements:
    i)   To undertake research/teaching/extension education activities.
    ii)   To take initiative for developing research projects to obtain funding.
    iii)   Any other duty that may be assigned from time to time.

18. **Agricultural Economist (Outstation) in the pay scale of Rs.15600-39100+AGP Rs. 6000/-**

   i). B.Sc.(Agri.)/ B.A with Economics/B.Sc. (Hons) in Economics/B.Sc. Agri.(Hons)/ B.Sc. Economics/B.Sc. Hort./B.Sc (Forestry)/B.Sc. (Agri.-MaCo)/B.Com/Bachelor in Business Administration/Bachelor in Business Economics.
   ii). Master's degree in Agricultural Economics/Economics/Business Economics.
   iii). At least 60% marks at Bachelor's level and 60% marks or OCPA of 6.00 out of 10.0 at Master's level.
   iv). Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics impact factor.
   v). Matric level certificate of Punjabi language of Punjab School Education Board or any other recognized Board (as first or second language) (if not, the candidate is required to pass the same within one year of appointment).

Note 1: A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2: The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

- The candidate having completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, **and**

- The candidate has minimum 2 research publications having cumulative NAAS rating not less than 10.0 or with Clarivate Analytics (CA) impact factor.
OR
- The candidate has minimum 3 research papers, each with at least 4.5 NAAS rating or with Clarivate Analytics (CA) impact factor.

Note 3: In case of non-NAAS rated papers, Clarivate Analytics (CA) Impact factor journals will be considered as NAAS rated with rating of 6+CA impact factor.

Note 4: Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Job Responsibilities:

   i) To undertake research/teaching/extension education activities.
   ii) To take initiative for developing research projects and to obtain funding.

   iii) Any other duty that may be assigned from time to time.

19.   **Assistant Professor (Home Science) (outstation) in the pay scale of Rs.15600-39100+AGP Rs.6000/-.**

   i)   B.Sc. (Home Science)
   ii)   Master's degree in any discipline of Home Science
   iii) At least 60% marks at Bachelor's level and 65% marks or OCPA of 6.50 out of 10.00 at Master's level.
   iv)   Must have qualified National Eligibility Test (NET) in the relevant discipline conducted by ASRB/UGC/CSIR along with one publication in NAAS (National Academy of Agricultural Sciences, New Delhi) rated refereed journal and equivalent with at least 4.5 NAAS rating or with Clarivate Analytics impact factor.
   v)   Must have passed Matric level certificate of Punjabi language from Punjab School Education Board or any other recognized Board (as first or second language).

Note 1:   A candidate, who does not possess Master's degree in the relevant subject but possesses Ph.D. degree in the discipline required at Master's level, shall be eligible for the post.

Note 2:   The candidate holding Doctorate degree in the relevant subject required at Master's level shall be exempted from passing NET provided, it has been done with course work as prescribed by the UGC regulations 2009

OR

-    Thecandidate completed Ph.D without course work from among 500 top ranking foreign Universities of the world shall be exempted from NET, and

-    The candidate has minimum 2 research publications having cumulative NAAS ratingnot less than 10.0.

OR

-    The candidate has minimum 3 research papers, each with atleast NAAS rating of 4.5.

Note 3:   In case of non NAAS rated papers, Clarivate Analytics (CA) impact factor journals willbe considered as NAAS rated with rating of 6+CA impact factor.

Note 4:   Only those research papers will be considered that have been published or accepted for publications by the last date of submission of application.

Note 5:   The candidate should have cleared 4 years degree programme at Graduation/Bachelor Level.

-    The candidates who have completed Bachelor degree in 3 years should have cleared their deficiency courses in relevant subjects Bachelor's degree during theirMaster's degreeor should have completed one year duration Hons./Bridged/specialprogramme etc.

Job Responsibilities:

   i) To undertake Extension Education/Research/Teaching activities.

   ii) To take initiative for developing projects and to obtain funding.

   iii) Any other duty that may be assigned from time to time.

   The appointment to this post shall be co-terminus with the scheme, in which the posts are provided.

20. **Technical Assistant (Engg.) in the scale of Rs. 5200-20200 + GP Rs.2800/-.**

1) Bachelor degree in Mechanical Engineering (B.E/B.Tech) from recognized institution with certified training in Auto CAD, Solid Works, Uni-Graphics (Ug-NX) or other drafting and designing software along with one year experience in relevant field.

OR

10+2 (Non-Medical) with three years Diploma in Mechanical Engineering from recognized institution with certified training in Auto CAD, Solid Works, Uni-Graphics (Ug-NX) or other drafting and designing software along with two years experience in relevant field.

2) Knowledge of Punjabi upto Matric level.

Desirable:

Experience in 3D drawings of Plant layout and Post Harvest Machinery i.e. Atta Chakki, Oil Mill, Rice Mill, Jaggery Plant etc.

Age Limit: 18 to 37 years.

Selection Criteria:

1)	Written/ Skill/ Practical test	50 %
2)	Academic (qualifying exam)	30 %
3)	Higher qualification	10 %
4)	Experience	10 %
	Total	**100 %**

Note: 1. **Written test for the post of Technical Assistant (Engg.) is as under:**

(I) Technical (related to the post): 25 marks
(II) Arithmetic & Mental ability: 15 marks
(III) English: 10 marks
(IV) The minimum qualifying marks for candidates to become eligible shall be 40% of total marks of the written test irrespective of the category. 01 mark will be awarded for each correct answer and $\frac{1}{4}^{th}$ mark will be deducted for every wrong answer.

Note: 2. ½ mark for each completed half year of technical experience in relevant field will be awarded over and above the minimum required experience, if any.

Note: 3. To calculate score in case of qualifying exam and higher qualifications, the percentage of marks obtained by the candidate shall be multiplied by 0.30 and 0.10 respectively.

4. Age relaxation as per Punjab Govt. rules. However, the relaxation in age up to 45 years for the candidates who have been engaged in the PAU on contract basis. The relaxation in age will be equivalent to the period for which the candidate has served PAU/Govt. Organization/Boards/ Corporations on contract basis.

5. The post is non-promotional.

6. The pay of the incumbent shall be regulated in terms of the Punjab Govt. circular No.7/204/2012-4FPI/66 dated 15-1-2015.

Basic syllabus for the post of Technical Assistant (Engg.)

(Reference: PUNJAB TECHNICAL UNIVERSITY, KAPURTHALA Syllabus for Diploma
in Mech Engineering)

Desirable: Experience of machine design using CAD, Solid Geometry and related software.

S.No	Subject
1	Machine Drawing
2	Basic Thermodynamics
3	Strength Of Materials
4	Material Science And Metallurgy
5	Production Technology
6	I.C. Engine And Gas Turbines
7	Fluid Mechanics And Machinery
8	Automobile Engineering
9	Machine Design
10	Refrigeration And Heat Transfer
11	Computer Aided Design And Manufacturing
12	Processing Plant Layout Designing

Professor cum Head
Deptt. Processing & Food Engineering
P.A.U., LUDHIANA.

22.12.2020

Director
Punjab Agriculture University
Ludhiana.

Dir:
P.
Ludhiana.

1

1. Machine Drawing

Syllabus

Introduction: Symbols of standard tolerances, machining symbols, surface finish and welding symbols, sectioning representation, dimensioning principles.

Fasteners: Various types of screw threads, types of nuts and bolts, screwed fasteners, welding joints and riveted joint.

Rivets and Riveted Joints: Shapes of rivet heads, lap and butt joints, single and multiple riveted joints, straight and zig-zag riveting, caulking and fulkering.

Assembly and dis-assembly of the following:

i. Keys and shaft couplings: Types of keys, comparison between keys and cotters, Couplings and its classifications: Protected type flange coupling, Pin type flexible coupling, muff coupling, Oldham, universal coupling, claw coupling, cone friction clutch

ii. Knuckle and cotter joints

iii. Pipe and Pipe fittings: flanged joints, spigot an socket joint, union joint, hydraulic an expansion joint

iv. Boiler Mountings: steam stop valve, feed check valve, safety valve, blow off cock.

v. Bearings: swivel bearing, thrust bearing, plumber block, angular plumber block

vi. Miscellaneous: Screw Jack, Piston, connecting rod

2. Basic Thermodynamics

Syllabus

Unit-I

Basic Concepts: Thermodynamics: Macroscopic and Microscopic Approach, Thermodynamic Systems, Surrounding and Boundary, Thermodynamic Property – Intensive and Extensive, Thermodynamic Equilibrium, State, Path, Process and Cycle, Quasi-static, Reversible and Irreversible Processes, Working Substance. Concept of Thermodynamic Work and Heat, Equality of Temperature, Zeroth Law of Thermodynamic and its utility.

Unit-II

First Law of Thermodynamics: Energy and its Forms, Energy and 1st law of Thermodynamics, Internal Energy and Enthalpy, 1st Law Applied to Non-Flow Process, Steady Flow Process and Transient Flow Process, Throttling Process and Free Expansion Process. Numericals.

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Unit-III

Second Law Of Thermodynamics: Limitations of First Law, Thermal Reservoir Heat Source and Heat Sink, Heat Engine, Refrigerator and Heat Pump, Kelvin- Planck and Clausius Statements and Their Equivalence, Perpetual Motion Machine of Second Kind. Carnot Cycle, Carnot Heat Engine and Carnot Heat Pump, Carnot's Theorem and its Corollaries, Thermodynamic Temperature Scale, Numericals

Unit-IV

Entropy: Clausius Inequality and Entropy, Principle of Entropy Increase, Temperature-Entropy Plot, Entropy Change in Different Processes, Introduction to Third Law of thermodynamics. Availability, Irreversibility and Equilibrium: High and Low Grade Energy, Effectiveness and Irreversibility. Numericals.

Unit-V

Compressors: Introduction, Types of compressors, Rotary compressor, Centrifugal compressor, Axial flow compressor, Reciprocating compressor, Applications of compressors, Surging, Choking, Stalling, Comparison of various compressors.

Pure Substance and its Properties, Phase and Phase Transformation, Vaporization, Evaporation and Boiling , Saturated and Superheat Steam, Solid – Liquid – Vapour Equilibrium, T-V, P-V and P-T Plots During Steam Formation, Properties of Dry, Wet and Superheated Steam, Property Changes During Steam Processes, Temperature – Entropy (T-S) and Enthalpy – Entropy (H-S) Diagrams, Numericals.

Unit-VI

Thermodynamic Relations: T-Ds Relations, Enthalpy and Internal Energy as a Function of Independent Variables, Specific Heat Capacity Relations.

3. Strength Of Materials

Syllabus

Unit-I

Simple, Compound Stresses and Strains: Stress and Strain and their types, Hook's law, longitudinal and lateral strain, Poisson's ratio, stress-strain diagram for ductile and brittle materials, bar of uniform strength, stress in a bar, elastic constants and their significance, relation between elastic constants, Young's modulus of elasticity, modulus of rigidity and bulk modulus. Two dimensional stress system, stress at a point on a plane, principal stresses and principal planes, Mohr's circle of stress ellipse of stress and their applications. Generalized Hook's law, principal stresses related to principal strains.

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Unit-II
Bending Moment (B.M) and Shear Force (S.F) Diagrams: S.F and B.M definitions; relation between load, shear force and bending moment; B.M and S.F diagrams for cantilevers, simply supported beams with or without overhangs, and calculation of maximum B.M and S.F and the point of contra flexure under the following loads: a) Concentrated loads b) Uniformity distributed loads over the whole span or part of span c) Combination of concentrated and uniformly distributed load d) Uniformly varying loads

Unit-III
Torsion: Derivation of torsion equation and its assumptions and its application to the hollow and solid circular shafts. Torsional rigidity, combined torsion and bending of circular shafts; principal stress and maximum shear stresses under combined loading of bending and torsion.

Unit-IV
Columns and struts: Introduction, failure of columns, Euler's formula, Rankine-Gordon's formula, Johnson's empirical formula for axially loaded columns and their applications.

Unit-V
Springs: Close-coiled springs, leaf springs.

Unit-VI
Cylinders: Thin and thick cylinders, Lame's Theorem, compound cylinders, spherical vessels.

4. Material Science And Metallurgy

Syllabus

Unit-I
Introduction: Engineering materials, material classifications, mechanical, thermal, electrical, magnetic, chemical, optical and physical properties of materials

Crystallography: Types of crystal structures, crystal lattice (simple cubic, body centered cubic, face centered cubic, hexagonal close packed), Crystallographic notation of atomic planes (Miller Indices), polymorphism and allotropy.
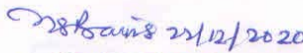
Unit-II
Engineering Materials: Classification of Iron, Manufacture of pig iron, wrought iron, Cast iron and steel, Types of Cast Iron: White, malleable, grey and alloy and their usage, different ores of iron

Unit-III
Imperfections in Metal Crystal: Introduction to metal crystal, Classification of Crystal Imperfections, Point defects, Line defects, Surface defects, volume defects. Effect of imperfection on metal properties. Elastic deformation, Plastic deformation, Slip, Twinning,

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Principal of cold and hot working of metals and their effect on mechanical properties, Work (Strain) Hardening, Recovery and Recrystallisation and Grain growth.

Unit-IV
Alloys: Properties of aluminum, copper, zinc, tin, lead. Classification of carbon Steels and Alloy Steel (Silicon steel, High speed tool steel, Heat resistance steel, Spring steel, Stainless steel, Chrome vanadium steel, Nickel steel, Vanadium steel, Manganese steel) Properties and usage of steels, Effects of various alloying element of steel like Cr, Ni, Co, Va, W, Si, Mn, S.

Unit-V
Equilibrium Diagrams: System phases and structural constituents, Cooling curves, Phase diagram, Gibb's phase rule, Lever rule, Classification of equilibrium diagrams, Two metals completely soluble in liquid state and solid states, Two metals completely soluble in liquid state but partly soluble in solid states, Eutectic reaction, Peritectic reaction, Eutectoid reaction.

Iron-Carbon Systems: Reactions involved in Iron-Carbon systems, Phase transformation in the iron carbon diagram (i) Formation of Austenite (ii) Transformation of austenite into pearlite (iii) Martensite transformation in steel, time temperature transformation (TTT) curves.

Unit-VI
Heat Treatment of Steels: Principles and applications of heat treatment processes viz. annealing, normalizing hardening, tempering; harden ability & its measurement, surface hardening processes. Defects in heat treatment and their remedies

5. Production Technology

Syllabus
Unit-I
Introduction: Introduction to metal casting, Types of patterns, pattern materials and allowances, Color coding and storing of patterns, moulding methods and Processes,

Unit-II
Moulding: Moulding materials: Moulding sand compositions and moulding sand properties, Sand testing, Types of moulds, Core sands, Types of cores, Core baking, Gates and risers and their design. Selection of furnace- Crucibles oil fired furnaces, Electric furnaces, Cupola Furnace.

Unit-III
Casting: Casting processes: Sand casting, shell mould casting investment casting, permanent mould casting, full mould casting, vacuum casting. Die casting. Centrifugal casting, continuous casting.

Casting defects, their causes and remedies.

Metallurgical considerations in casting, Solidification of metals and alloys, directional solidification, segregation, nucleation and grain growth, critical size of nucleus, casting of copper alloys.

Cleaning and finishing of castings, Testing and Inspecting of castings.

Unit-IV
Introduction to Welding: Welding introduction and classification of welding, processes, welding terminology, general principles, welding positions, filler metals.

Unit-V
Welding Processes: Gas welding and gas cutting, principle, oxyacetylene welding equipment oxyhydrogen welding. Flame cutting.

Electric arc welding. Principle, equipment, types- MIG, TIG submerged arc and others. Welding electrodes, classification and selection of electrodes, welding arc and its characteristics, arc stability, arc blow. Thermal effects on weldment, Heat affected zone

Resistance welding- principle and their types i.e. spot, seam, projection, upset and flash

Thermit welding, electro slag welding, friction welding, plasma are welding electron beam welding, atomic hydrogen hydrogen welding. Basic considerations in joint design,

Welding defects, their cases and remedies.

Unit-VI
Soldering and Brazing: Brazing, braze welding and soldering, principles of soldering and brazing, types of solders, description of tools and equipments, defects and remedies.

6. I.C. Engine And Gas Turbines

Syllabus

Unit-I
IC Engines: Classification of IC engines, Two stroke and four stroke engines, rotary engines and their comparison, Principle of Carburation, Essential requirements for petrol and diesel fuels; Theory of combustion in SI and CI engines, study the various phenomenon such as turbulence squish and swirl, dissociation and pre ignition, Theory of detonation (knocking) for SI and CI engines, Octane and Cetane rating of fuels, octane and cetane number knockmeter and doping of fuels. Methods of governing and cooling of IC Engines, effect of compression ration and of air fuel ratio on power and efficiency of an engine. Variation of engine power with altitude; supercharging its advantages and application; supercharging of IC engines; types of superchargers.

Unit-II

Steam Boilers, Boiler mountings, Accessories and its performance: Functions of a Boiler, Classification of boilers, Terms commonly employed in connections with boilers, comparison between water tube and fire tube boilers, construction of Cochran, Locomotive, Lancashire, Babcock and Wilcox boilers in detail, merits and demerits of fire-tube and water-tube boilers; boilers mountings and its accessories, , boiler efficiency of thermal, economiser efficiency, boiler power and heat loss in a boiler plant.

Unit-III

Rotary Compressors: Introduction and general classification of rotary compressors; comparison of rotary compressors with reciprocating processors; operation of positive displacement type of rotary compressors like roots blower, Lysholm compressor and Vane type Blower. Applications of Steady Flow Energy Equation and thermodynamics of Rotary compressors; Complete representation of compression process on T-S coordinates with detailed description of areas representing total work done and Polytropic work done, area representing energy lost in internal friction, energy carried away by cooling water etc. on T-S coordinates for uncooled and cooled compression, Isentropic, polytropic and isothermal efficiencies as ratios of areas representing various energy transfers T-S coordinates.

Unit-IV

Centrifugal Compressors: Complete thermodynamic anlysis of centrifugal compressor stage, polytropic, isentropic and isothermal efficiencies; complete representation of compression process starting from ambient air to flow through suction pipe, impeller, diffuser and finally to delivery pipe on T-S coordinates; Slip factor, power input factor; various modes of energy transfer in impeller and diffuser; Degree of reaction and its derivation; energy transfer in backward, forward and radial vanes; pressure coefficient as a function of slip factor, efficiency and outcoming velocity profile from the impeller, surging and choking in centrifugal compressors.

Unit-V

Axial Flow Compressors: Different components of axial flow compressors and their arrangement; discussion on flow passages and simple theory of aerofoil blading; angle of attack; coefficients of lift and drag; turbine versus compressor blades; Detailed discussion on work done factor; Degree of reaction and Blade efficiency and their derivations; Isentropic, polytropic and Isothermal Efficiencies. Surging, choking and stalling in axial flow compressors, characteristics curves for axial flow compressor, Comparison on axial flow compressor with centrifugal compressor and reaction turbine; field of application of axial flow compressors

Unit-VI

Steam Nozzle and Turbine: Introduction, types of steam nozzles, flow of steam through nozzles, steam injector. Introduction to steam turbines , classifications of turbine, difference b/w impulse and reaction turbine, advantages of steam turbine over reciprocating steam engine, simple impulse turbine, velocity diagram for moving blades for an impulse turbine, combined velocity diagram, maximum work and maximum diagram efficiency, methods of reducing rotor speed, working of reaction turbine, governing and improvement of turbine.

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7. Fluid Mechanics And Machinery

Syllabus

Unit-I

Introduction: Physical properties of fluids, Types of fluids. Concept of viscosity, Compressibility and Elasticity, Surface tension and capillarity, Mach number, Newtonian and Non-Newtonian fluids.

Unit-II

Concept of Fluid Statics: Concept of static fluid pressure; Pascal's law and its engineering applications, Stability of floating and submerged bodies; Metacentric height and its determination, Buoyancy and flotation.

Concept of Fluid kinematics: Flow Classification, Stream lines, Streak lines, Continuity equation, Velocity, Tangential, Normal, Local and Convective Accelerations, Types of fluid motions, rotation, Circulation, Vorticity, Continuity equation in Cartesian and cylindrical coordinate, Velocity potential, Stream function.

Unit-III

Concept of Fluid dynamics: Euler's equation, Bernoulli's equation, Momentum equation and its applications.

Flow measuring devices: Venturimeter, Orifice meter, Pitot tube, Rota meter, Circular orifice, Current meter, Notches.

Unit-IV

Internal Flows: Laminar and Turbulent Flows: Reynolds number, critical velocity, critical Reynolds number, hydraulic diameter, flow regimes; Hagen – Poiseuille equation; Darcy equation; Head losses in pipes and pipe fittings; Flow through pipes in series and parallel.

Unit-V

Hydraulic Turbines and its Performance: Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine- working operations, work done, efficiencies, characteristic curves, governing of turbines, selection of type of turbine, concept of cavitation, surge tank, water hammer.

Unit-VI

Centrifugal and Reciprocating Pumps: Classification of pumps, working, work done- manometric head- losses and efficiencies- specific speed, pumps in series and parallel, performance characteristic curve.

Other Devices: Hydraulic ram, airlift pump, jet pump, fluid coupling, torque converter.

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8. Automobile Engineering

Syllabus

Unit-I

Introduction: Basic structure, general layout and type of automotive vehicles, Frameless and unitary construction; position of power unit, front wheel front drive, front wheel rear drive, rear wheel rear drive and four-wheel drive.

Power Unit: Power requirements - motion resistance and power loss, tractive effort and vehicle performance curves; selection of power unit and engine performance characteristics; pollution due to vehicle emission and exhaust emission control system, silencers, types of pistons and rings.

Unit-II

Fuel Supply System: Air cleaner and fuel pumps; Air fuel requirements and carburization; constructional details of Carter carburetors and fuel injection systems; MPFI (Petrol), Diesel fuel system- cleaning, injection pump, injector and nozzles, Common Rail fuel supply system,

Chassis and Suspension -Loads on the frame, considerations of strength and stiffness, engine mounting, independent suspension systems (Mac Pherson, Trailing Links, Wishbone), shock absorbers and stabilizers; wheels and tyres, tyre wear types, constructional details of plies

Unit-III

Transmission system: Basic requirements and standard transmission systems; constructional features of automobile clutch, gear box, differential, front and rear axles; overdrives, propeller shaft, universal joint and torque tube drive, Rear wheel / front wheel drive, principle of automatic transmission.

Unit-IV

Lubrication and Cooling Systems: Necessity of lubrication; Desirable properties of lubricants; various types of lubricants and oil additives; different systems of lubrication - oil filters, oil pumps and oil pressure indicator; crankcase ventilation and dilution. Purpose of cooling, air and water cooling systems; radiator, thermostat, pump and fan, vehicle cabin cooling and heating systems:

Unit-V

Steering System: Requirement and steering geometry; castor action, camber and king pin angle, toe-in of front wheels, steering linkages and steering gears; wheel alignment; power steering, Ball recirculating mechanism

Braking System: General braking requirements, mechanical, hydraulic, vacuum, power brake, servo mechanism and ABS, shoe and disc brakes

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9. Machine Design

<p align="center">Syllabus</p>

Unit-I
Basics of Design: Selection of Engineering Materials, principles of design in Aesthetics and ergonomics

Design methodology: Concept of machine design and its types, basic procedure of machine design, basic requirements of machine elements, design of machine elements, concept of concurrent engineering, modes of failure, factor of safety, fracture mechanics, concept of fatigue and endurance strength.

Unit-II
Riveted and Welded Joints: Introduction, types of riveted joint, modes of failure of a riveted joint, strength and efficiency of a riveted joint, Riveted joints for boiler shell according to I.B.R.; riveted structural joint; and riveted joint with eccentric loading; Types of welded joints; strength of welds under axial load; Welds under eccentric loading

Bolts: Understanding the various stresses/ failure in bolted joints, design of cylindrical covers, basic and eccentrically loaded bolts

Unit-III
Design of Keys and Couplings: Design of sunk keys under crushing and shearing, design of splines, design of sleeve and solid muff coupling, clamp or compression coupling, rigid and flexible flange coupling, design of universal joint.

Unit-IV
Cotter & Knuckle Joints: Design of spigot and socket cotter joint, sleeve and cotter joint, Gib& cotter joint and knuckle joint

Unit-V
Shaft: Design of shafts subjected to pure torsion; Pure bending load; Combined bending and torsion; Combined torsion; Bending and axial loads

Unit-VI
Lever design: Basic lever design, design of foot and hand lever, cranked lever, bell crank lever, safety valve lever and shoe brake lever

Pipe Joints: Stresses in pipe joints, design of circular flange pipe joint, oval flanged pipe joints, square flange pipe joint.

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10. Refrigeration And Heat Transfer

Syllabus

Unit-I

Introduction: Definition of Heat Transfer, Reversible and irreversible processes, Modes of heat flow,Combined heat transfer system and law of energy conservation.

Conduction: Thermal conductivity ofmaterials, generaldifferential equation of conduction, one dimensional steady state conduction through plane and composite walls,Insulation materials

Unit-II

Convection: Free and Forced Convection- Newton's law of cooling, heat transfer coefficient in convection,analysis of free and forced convection, useful non dimensional numbers and empirical relationships for free and forced convection, Introduction to turbulent boundary layer.

Heat Exchangers: Classification, Analysis of a parallel/counter flow heat exchanger, Heat exchanger effectiveness.

Unit-III

Radiation: Introduction, absorptivity, reflectivity and transmissivity, Planck's law, Stefan-Boltzman law, Kirchoff'slaw, black body radiation, radiation exchange between black surfaces.

Unit-IV

Basics of heat pump & refrigerator; Carnot's refrigeration and heat pump; Units of refrigeration; COP of refrigerator and heat pump;

Classification of Refrigeration Systems: Simplevapour compression system, vapour absorption system, refrigerants, desirable properties of ideal refrigerant;other refrigeration systems;representation of theoretical and actual cycle on T-S and P-H charts;

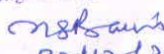## 11. Computer Aided Design And Manufacturing

Syllabus

Unit-I

Introduction to CAD: Introduction, Design Process, Application of computers in design, Creating manufacturing database, benefits of CAD, Software configuration of a graphics system, functions of a graphics package, geometric modeling, Database structure and control, Graphics standard: GKS and IGES.

Unit-II

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Geometric Transformations: Mathematics preliminaries, matrix representation of 2 and 3 dimensional transformation, Concatenation of transformation matrices, Application of geometric transformations

Representation of surfaces and solids: Polygon, meshed and ruled surfaces: Bezier curves; B-spline curves

Unit-III

Basics of Geometric Modelling: Need of Geometric Modeling, types of geometric modeling, geometric modeling representation, and geometric modeling techniques and uses, parametric representation of analytical and synthetic curves

Unit-IV

Numeric Control: Types of NC systems, MCU and other components, NC manual part programming, coordinate systems, G & M codes, Part program for simple parts, computer assisted part programming. Direct numerical control, Adaptive control in machining system, Combined DNC/CNC system

12. Processing Plant Layout Designing

Introduction: Introduction to facilities planning and design, plant layout, material handling and their interrelationship.

Site Location: Importance of location, hierarchy of location problems, factors affecting site location; factors in heavy manufacturing location, light industry location, warehouse location, retail location. Various theories/models of site location like bid rent curves, Weber's isodapanes, Weber's classification of industries, Hoover's tapered transport rates, agglomeration, factor rating method, single facility location, load-distance model, break-even analysis, transportation method. New plant location and shut down under dynamic conditions.

Plant Layout: Objectives of a good plant layout, principles of a good layout, classical types of layouts like product layout, process layout, fixed-position layouts, cellular layouts and hybrid layouts. Factors affecting plant layout: man, material, machine, movement, waiting, service, building and change, features and considerations of each factor. P - Q chart, systematic layout planning, relationship (REL) chart, traditional layout configuration, production space requirements, manual CORELAP algorithm and examples, preparing process layouts and the considerations thereon.
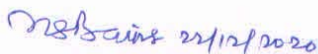
Product Layouts: basic features of mass manufacturing, advantages & disadvantages of flow-line production, product-oriented layout - assumptions & types, assembly line layout, assembly line balancing. Design of an assembly line, layout heuristics for assigning tasks in assembly line balancing, assembly line balancing equations.

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Computerized Layout: Evaluation of layout, computerized layout, flowcharts of various techniques like CRAFT, ALDEP and CORELAP.

Material Handling: Concept of material handling, principles of material handling, factors affecting material handling, objectives, material handling equation

Material Handling Equipments: Selection of material handling systems and equipments: Automated Guided Vehicles, types, features, usage. Conveyors: basic functionality requirements, types of Conveyors, application considerations, operational considerations. Cranes, hoists and industrial trucks.

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21.   **Laboratory Attendant (PAU Hospital) in the scale of Rs. 5910 - 20200 + Rs.1900/- Grade Pay.**

Qualifications:

1. 10+2 with one year diploma in Medical Laboratory Technology from a recognised institution with three years working experience in Clinical Laboratory.

OR

Matric with one year diploma in Medical Laboratory Technology from a recognised institution with five years working experience in Clinical Laboratory.

OR

Matric with six years working experience in Clinical Laboratory.

2. Knowledge of Punjabi upto Matric level.

Selection Criteria:

1) Skill test	50 %
2) Academic (qualifying exam)	30 %
3) Higher qualification	10 %
4) Experience	10 %
Total	**100 %**

Note: 1.   Age not less than 18 years and not more than 37 years.

2.   Age relaxation and reservation shall be applicable as per Punjab Govt. rules. The relaxation in age up to 45 years for the candidates who have been engaged in the PAU on contract basis. The relaxation in age will be equivalent to the period for which the candidate has served PAU/Govt. Organization/Boards/ Corporations on contract basis.

3.   The pay of the incumbent shall be regulated in terms of the Punjab Govt. circular No.7/204/2012-4FPI/66 dated 15-1-2015.