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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

REVENUE DIVISION

(Central Board of Revenue)

NOTIFICATIONS

Islamabad, the 22nd July, 2005

CUSTOMS SALES AND FEDERAL EXCISE

S. R. O. 736(I)/2005.—In exercise of the powers conferred by section 179 of the Customs Act, 1969 (IV of 1969), section 45 of the Sales Tax Act, 1990 read with section 2(30) thereof and section 2 (12) of the Federal Excise Act, 2005, read with section 31 (2) thereof, the Central Board of Revenue is pleased to rescind its Notification No. SRO 08(I) 2005 dated 01-01-2005, as amended from time to time, with effect from 01-8-2005.

[2(25)S/Adj/04.]

(2159)

Price : Rs. 20.50

[3053(2005)/Ex. Gaz.]

S. R. O. 737(I)/2005.—In exercise of the powers conferred by section 3 of the Customs Act, 1969 (IV of 1969), section 30 of the Sales Tax Act, 1990 and section 2(12) of the Federal Excise Act, 2005 read with rule 48 of the Federal Excise Rules, 2005, and in supersession of its notification No.SRO-644(I)/2005 dated 29-06-2005, the Central Board of Revenue is pleased to appoint the officers specified in column (2) of the table below to be the Collectors (Appeals) for deciding appeals against the orders passed by the officers upto the rank of Additional Collectors in respect of the Collectorates/Offices specified in column (3) thereof:—

S. No.	Officers	Collectorates/Offices
1	2	3
1.	Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Karachi-I	(i) Collectorate of Customs (Appraisalment), Karachi. (ii) Model Customs Collectorate, Custom House, Karachi. (iii) Office of the Director of Customs (Valuation), Karachi. (iv) Collectorate of Customs, Port Muhammad Bin Qasim, Karachi. (v) Collectorate of Customs (Exports), Karachi. (vi) Collectorate of Customs (Preventive), Karachi. (vii) Any cases specifically assigned by the CBR.
2.	Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Karachi-II	(i) Sales Tax House, Karachi. (ii) Large Taxpayers Unit, Karachi. (iii) Any cases specifically assigned by the CBR.
3.	Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Hyderabad.	(i) Collectorate of Customs, Sales Tax and Federal Excise, Hyderabad. (ii) Collectorate of Customs, Sales Tax and Federal Excise, Quetta. (iii) Any cases specifically assigned by the CBR.
4.	Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Multan.	(i) Collectorate of Customs, Sales Tax and Federal Excise, Multan. (ii) Any cases specifically assigned by the CBR.
5.	Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Faisalabad.	(i) Collectorate of Customs, Faisalabad. (ii) Collectorate of Sales Tax and Federal Excise, Faisalabad. (iii) Any cases specifically assigned by the C.B.R.

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| 6. Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Lahore. | (i) Collectorate of Sales Tax and Federal Excise, Lahore.
(ii) Collectorate of Customs, Lahore.
(iii) Large Taxpayers Unit, Lahore.
(iv) Any cases specifically assigned by the CBR. |
| 7. Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Gujranwala. | (i) Collectorate of Sales Tax and Federal Excise, Gujranwala.
(ii) Collectorate of Customs, Sambrial/Sialkot.
(iii) Any cases specifically assigned by the CBR. |
| 8. Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Rawalpindi. | (i) Collectorate of Customs, Rawalpindi.
(ii) Collectorate of Sales Tax and Federal Excise, Rawalpindi.
(iii) Any cases specifically assigned by the CBR. |
| 9. Collector, Collectorate of Customs, Sales Tax and Federal Excise (Appeals), Peshawar. | (i) Collectorate of Customs, Peshawar.
(ii) Collectorate of Sales Tax and Federal Excise, Peshawar.
(iii) Any cases specifically assigned by the CBR. |

2. This notification shall take effect from 01-8-2005.

[C.No.2(25)S/Adj/04.]

Sd/-
SAEED AHMED ZAIDI,
Member (Legal).

CABINET SECRETARIAT

(Cabinet Division)

Islamabad, the 19th July, 2005

S. R.O. 738(I)/2005.—In exercise of the powers conferred by sub rule (2) of rule 3 of the Civil Servants (Appointment, Promotion & Transfer) Rules, 1973 and after obtaining the advice of the Federal Public Service Commission as required *vide* sub-clause (i) & (ii) of clause (b) of sub-section (1) of Section-7 of the Federal Public Service Commission (Ordinance), 1977 (XLV of 1977), the following

amendments shall be made in the Recruitment Rules of the National Documentation Centre under the Cabinet Division notified *vide* SRO No.689(I)/88, dated the 15th August, 1988, namely:—

In the aforesaid Recruitment Rules:—

I. The designation and BS of posts mentioned in column (1) below shall be substituted with the designation and BS as mentioned against each in column (2):—

(1)	(2)
Archivist / Research Coordinator (BS-19)	Director (BS-19)
Senior Research Officer (BS-18)	Deputy Director (BS-18)
Research Officer (BS-17)	Assistant Director (BS-17)

II. This Notification issues with the concurrence of Establishment Division *vide* their O. M. No. 2/1/82-R.5 dated 14-06-2005 and FPSC *vide* their letter No. F. 15-9/2005-RR dated 12-07-2005.

[F. No. 3/1/2004-Admn(NDC)].

Sd/-
AFTAB-UL-ISLAM RAJA,
Deputy Secretary (IPC).

FINANCE DIVISION

(NFC Secretariat)

Islamabad, the 21st July, 2005

S. R. O. 739(I)/2005.—In pursuance of Article 160 (1) of the Constitution of the Islamic Republic of Pakistan, the President is pleased to constitute National Finance Commission consisting of the following namely:—

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|--|-----------------|
| (1) Minister for Finance
Government of Pakistan | <i>Chairman</i> |
| (2) Minister for Finance
Government of the Punjab | <i>Member</i> |

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|-----------|---|------------------------|
| (3) | Minister for Finance
Government of Sindh | <i>Member</i> |
| (4) | Minister for Finance
Government of NWFP | <i>Member</i> |
| (5) | Minister for Finance
Government of Balochistan | <i>Member</i> |
| (6) | Advisor to the Prime Minister on Finance | <i>Member</i> |
| (7 to 10) | One Member from each Province to be
notified in consultation with the Governors
of the Provinces. | |
| (11) | Finance Secretary
Government of Pakistan | <i>Official Expert</i> |

Terms of Reference

2. The terms of reference for the Commission are as under:—
 - (a) the distribution between the Federation and the Provinces of the net proceeds of the following taxes:
 - (i) taxes on income, including corporation tax, but not including taxes on income consisting of remuneration paid out of the Federal Consolidated Fund;
 - (ii) taxes on the sales and purchases of goods, imported, exported, produced, manufactured or consumed;
 - (iii) Sales Tax on Services (CE Mode);
 - (iv) Export duties on cotton;
 - (v) Consider the inclusion of other Federal Taxes including Customs Duties and Federal Excises, but not including taxes on income paid out of Federal Consolidated Fund.
 - (b) the making of grants-in-aid by the Federal Government to the Provincial Governments;

- (c) the exercise by the Federal Government and the Provincial Governments of the borrowing powers conferred by the Constitution;
- (d) examine the question of rationalization of payment of royalties on crude oil and of surcharge on natural gas collected by the Federal Government to the Provincial Governments;
- (e) to consider review of the distribution of share of taxes between the Federal Government and Provincial Governments;
- (f) to develop and enforce a mechanism for setting parameters to achieve fiscal discipline at the Federal and Provincial levels and for ensuring consistency in maintaining an appropriate fiscal balance at the consolidated level; and
- (g) any other matter relating to finance referred to the Commission by the President.

3. The National Finance Commission notified *vide* Gazette of Pakistan Extraordinary SRO 529(1)/2000, dated 22nd July, 2000, SRO 895(1)/2000 dated 18th December, 2000 and SRO 1043(1)/2003, dated 13th November, 2003, shall stand dissolved with immediate effect.

[No. F. 2(l)-NFC/2005.]

Sd/-

MIAN MUHAMMAD YOUNIS,
Joint Secretary (PF)
Secretary
National Finance Commission.

MINISTRY OF HEALTH

Islamabad, the 20th July, 2005

S. R. O. 740 (I)/2005.—In exercise of the powers conferred by sub-section (2) of section 17 of the Pharmacy Act, 1967 (XI of 1967), the Pharmacy Council of Pakistan, with the previous approval of the Federal Government, is pleased to make the following regulations, namely:—

CHAPTER I**PRELIMINARY**

1. **Short title and commencement.**—(1) These regulations may be called the Pharmacy Council of Pakistan (Doctor of Pharmacy Degree Course) Regulations, 2005.

(2) They shall come into force at once.

2. **Definitions.**—(1) In these regulations, unless there is anything repugnant in the subject or context,—

(a) “Act” means the Pharmacy Act, 1967 (XI of 1967);

(b) “approved pharmacy institution” means an institution which has been approved by the Pharmacy Council of Pakistan under sections 18 and 19 of the Act;

(c) “Doctor of Pharmacy Degree Course” means a Pharmacy Degree Course of five years duration offered by a Pharmacy institution (*i.e.* Faculty/Department/Institute/College) approved by the Pharmacy Council of Pakistan, leading to first professional degree in pharmacy, that is “Pharm. D.” degree; and

(d) “student” means a student enrolled for study in Doctor of Pharmacy Degree Course in any approved pharmacy institution.

(2) The words and expressions used but not defined, shall have the meaning assigned to them in the Act.

CHAPTER II**PHARMACY EDUCATION OBJECTIVES**

3. **General objectives.**—(1) The pharmacy education objectives regarding the curriculum of Doctor of Pharmacy Degree Course shall be to prepare a health caring and community oriented pharmacist who is competent to deal with the health and pharmaceutical based problems of the people in a scientifically sound and cost-effective manner using appropriate technology and holistic approach.

(2) A student after completion of his study in Doctor of Pharmacy Degree Course shall be eligible to practice pharmacy.

(3) The teaching in all the subjects of Doctor of Pharmacy Degree Course shall be integrated as far as possible.

4. **Knowledge related objectives.**—(1) A pharmacy graduate at the conclusion of his study in Doctor of Pharmacy Degree Course must possess specific knowledge, attitudes, skills and behaviour and shall be able to apply the knowledge of,—

- (a) the principles of science that are essential for understanding the human structures, functions and behaviour in health and disease including—
 - (i) structure and function of cells, organs and systems, and their adaptation to drugs and disease; and
 - (ii) behaviour of man as an individual, as a family member, and as a community member;
- (b) macroscopic and microscopic structures of human body from conception to completion of growth;
- (c) functions of normal human body at all levels of development;
- (d) abnormalities of structures and functions of human body and their causative agents;
- (e) clinical presentations of health and disease in terms of processes, both physical and mental;
- (f) preventive and therapeutic measures for management of health and disease;
- (g) legal aspects of pharmacy practice;
- (h) normal human behaviour and disorders of human behaviour resulting from non-organic causes;
- (i) present and future health problems of community and solutions of such problems through planning, implementation, critical evaluation and research in preventive programs;
- (j) handling of all common and health emergencies;
- (k) role of socio-cultural background, socio-economic factors, and changing environment in health and illness;

- (l) principles of drug surveillance;
- (m) concept of reproductive health and understanding of all related drug matters; and
- (n) basic principles of pharmacy ethics.

(2) A pharmacy graduate at the conclusion of his study in Doctor of Pharmacy Degree Course shall have sound knowledge of the following, namely:—

- (a) Comprehensive concept and knowledge of drugs and their development;
- (b) therapeutic uses of all drugs and medicines;
- (c) toxicological manifestation of drugs and their side effects;
- (d) management of drug induced toxicology;
- (e) management of drug administration;
- (f) management of pharmaceutical care;
- (g) complete understanding of drug posology; and
- (h) unbiased source of drug administration.

5. **Skills related objectives.**—(1) A pharmacy graduate at the conclusion of his study in Doctor of Pharmacy Degree Course shall be able to—

- (a) conduct interviews, take drug history of patients correctly, acquire ability to communicate and make accurate observations;
- (b) understand laboratory investigations and diagnostic reports, and interpret tests;
- (c) perform administrative duty as member of health care team as well;
- (d) promote rational drug use and dispense drugs rationally;
- (e) know the requirements of dispensing;
- (f) refer patients appropriately when required;

- (g) monitor the prescription with reference to drugs interactions;
- (h) monitor the adverse drug reaction and medication errors;
- (i) dispense drugs aseptically;
- (j) maximize the effect of drugs on patients;
- (k) supervise the procurement, storage and drugs delivery system;
- (l) provide information pertaining to poison and drugs to other health professionals and public;
- (m) act as Secretary, Pharmacy and Therapeutic Committee;
- (n) perform his role as member of the Pharmacy and Therapeutic Committee; and
- (o) evaluate and select drugs for the formulary.

(2) In addition to the abilities specified in clause (1), a pharmacy graduate shall—

- (a) acquire understanding of pharmaceutical manufacturing techniques;
- (b) be able to act as production pharmacist in normal activities related to manufacturing;
- (c) have adequate training in the fields of Quality Control (QC) and Quality Assurance (QA);
- (d) have adequate training in warehouse and packing of drugs;
- (e) acquire understanding of pilot scale manufacturing;
- (f) be well aware of the concept of Good Manufacturing Practices (GMP) and Current Good Manufacturing Practices (CGMP);
- (g) acquire understanding of pharmaceutical research and development;
- (h) acquire understanding of economics of purchase for hospitals and community pharmacy;
- (i) acquire understanding of proper storage conditions; and

- (j) basic principles of pharmaco-economics, pharmaco-vigilance, pharmaco-dynamics and pharmaco-epidemiology.

6. **Character and attitude objectives.** —A pharmacy graduate at the conclusion of his study in Doctor of Pharmacy Degree Course shall be able to,—

- (a) display virtues and personal character such as sense of responsibility towards patients, community and colleagues;
- (b) respect patient's right of confidentiality;
- (c) obtain informed consent;
- (d) recognize his Professional limitations;
- (e) develop and maintain good relations with patients and all persons concerned in the delivery of health care;
- (f) educate, guide and help in adoption of preventive and curative measures against disease;
- (g) improve his Professional knowledge, skills and attitudes continuously with a critical and enquiring approach;
- (h) show willingness to take part in education and training of students, para- medics and colleagues in health education;
- (i) assume leadership in the health care delivery team as well as accepts the leadership of his seniors, demonstrating a spirit of teamwork; and
- (j) identify himself with the community.

CHAPTER III

ADMISSION TO PHARMACY INSTITUTIONS

7. **Number of annual admissions, etc.**—(1) The optimum number of annual admissions of students in the First Professional in a pharmacy institution shall not be more than one hundred (including the reserved seats) in each session subject to the capacity of lecture rooms and the facilities in laboratories and libraries. However, the number of sessions will not be more than one in an academic year.

(2) The teacher and student ratio of 1:10, shall be maintained and adequate facilities including that of hospital will be provided for teaching and training of students.

(3) The number of students working in groups in laboratories shall not be more than three.

8. Minimum academic requirements for admissions.— (1) The following shall be the minimum academic qualifications for admission of a candidate to the First Professional of Doctor of Pharmacy Degree Course, namely:—

Priority 1.—The candidate shall have passed the Intermediate Science (F.Sc) Examination (Medical Group), or an equivalent examination from :
Board of Intermediate and Secondary Education in Pakistan;

or

the candidate shall have passed an examination of a foreign institution or examining body, which is equivalent to the Intermediate (F. Sc) Examination (Medical Group) of a Board of Intermediate and Secondary Education in Pakistan. Equivalence to be determined by Inter Board Committee of Chairmen (IBCC).

Priority 2.—The candidate shall have passed a higher examination of a Pakistani university with Biological Sciences provided that he has passed the Intermediate (F. Sc.) Examination (Pre-Medical Group) from a Board of Intermediate and Secondary Education in Pakistan. The admissions granted on this qualification will not exceed 10% of the total seats.

9. Admission to pharmacy institutions.—(1) Admission of students to pharmacy institutions including that to reserved seats shall be strictly on merit in accordance with regulation 8.

(2) A candidate seeking admission to a pharmacy institution shall possess adequate mental and physical health.

(3) Pharmacy institutions may allocate seats for children of the registered pharmacists provided that such seats shall not exceed five per cent of the total annual admissions of students in the First Professional.

(4) Pharmacy institutions shall allocate not more than two per cent of the total annual admissions of students in the First Professional for nominees of the proprietors, partners and directors of pharmaceutical industry as specified in the Companies Ordinance, 1984 (XLVII of 1984).

CHAPTER IV**CURRICULUM AND TEACHING**

10. **General principles regarding curriculum and teaching.**— (1) The following general principles shall be observed while formulating curriculum and teaching Doctor of Pharmacy program, namely:—

- (a) The institutions will follow the curriculum approved and notified by the Pharmacy Council of Pakistan;
 - (b) lectures shall not be overloaded with unnecessary and irrelevant details;
 - (c) more emphasis shall be given to tutorials, seminars, workshops, practical work and clinical training especially in the Fourth and final Professional;
 - (d) clinical pharmacy and hospital pharmacy training shall be conducted preferably in teaching/DHQ hospitals;
 - (e) appropriate arrangements shall be made for retail and community pharmacy training;
 - (f) the academic session shall not be less than nine months in one academic year or two semesters in one academic year;
 - (g) the teachers must set exemplary attitudes so as to inculcate qualities of character and attitudes expected of a good pharmacist, as laid down in regulation 6.
- (2) All subjects shall be integrated.

CHAPTER V**SYLLABI AND SUBJECT OBJECTIVES**

11. **Syllabi and subject objectives.**—Pharmacy institutions shall design the learning and teaching strategy for every subject based on the relevant guidelines regarding syllabi and subject objectives as specified in regulations 12, 13, 14, 15 and 16 with a view to ultimately achieve the pharmacy education objectives as provided in Chapter II, and shall involve as many principles of learning as possible.

12. Guidelines regarding syllabi and subject objectives for basic subjects.—The following guidelines are recommended regarding syllabi and subject objectives for basic subjects, namely:—

- (a) *Islamic Studies and Pakistan Studies.*—The applied aspects of the Islamic principles and Pakistan Studies are important. The time allotted for these subjects shall be utilized by inviting eminent scholars to speak on selected topics, conducting seminars and group discussions on moral values and practice in relation to medical and pharmaceutical sciences in the light of Islamic principles. The purpose is to bring positive behavioral changes in the students.
- (b) *Anatomy.*—In this subject emphasis shall be given to anatomy of different organs of human body. The students will be familiarized with basic structures, location of different organs which play a role in the normal function of human body and applied aspects of developmental, gross and microscopic anatomy without burdening the students with unnecessary details of basic anatomy. Efforts shall be made to demonstrate anatomical facts of practical importance through models, prospected parts, films and slides. It is desirable that the teaching of developmental, gross and microscopic anatomy be taught concurrently.
- (c) *Physiology.*—Students shall be taught the general principles of functions of human body with emphasis on practical applications and basic physiological consideration of different systems of human body. Functional study of different organs and their inter-relationship and basic histological study of human cells and different organs is another important objective. Experimental work in physiology shall illustrate important physiological concepts and measurements. Physiological phenomena must be demonstrated practically by using modern equipment.
- (d) *Pathology.*—The subject of pathology shall enable the students regarding—
 - (i) awareness of different diseases;
 - (ii) condition of diseases;
 - (iii) physiological variation in different diseases; and
 - (iv) hormonal changes in different diseases.

- (e) *Mathematics*.—Mathematics is the language of science. The study of mathematics is important as all the equations used in pharmacokinetics and pharmacodynamics are in the mathematical forms and studies of such results are in logarithmic and integration forms.
- (f) *Bio-statistics*.—In pharmacy the statistical approach plays a key role in various aspects of research on drugs. The bioassay in drug development is to measure the potency of some new compounds relative to some standard drugs in terms of the magnitude of their effects. Statistics is used to test as many assumptions involved in the assay. Statistics is also required to design the clinical trials to obtain pharmaceutical information of any drug. The statistical approach is also used to estimate parameters. Statistics also helps in documenting the results of a study. The statistical approach is required for screening of compounds for clinically active drugs. The knowledge of statistics is also required for the study of the dose response relationship.
- (g) *Computer*.—The students are required to learn basic introduction of computer with reference to their application in pharmacy.

13. **Guidelines regarding syllabi and subjects objectives for pharmaceutical subjects.**—The following guidelines are recommended regarding syllabi and subject objectives for pharmaceutical subjects, namely:—

- (a) *General Pharmaceutics*.—This is required to give the students an exposure about the basic terminologies used in pharmacy, basic techniques used in the field of pharmacy, knowledge about history and origin of pharmacy, different types of properties of pharmaceuticals and knowledge about physical processes used in pharmacy.
- (b) *Pharmaceutical Preparations*.—The objective to teach pharmaceutical preparations is to give the students knowledge about different dosage forms used in pharmacy, their small and large scale preparation, formulation of different dosage forms, and their role in the practice of community pharmacy.
- (c) *Pharmaceutical dispensing, practice and pharmacy*.—It is essential for a pharmacist to know while working in a pharmacy as how to prepare and supply medicines. This requires the knowledge of stability of medicines and their ingredients, principle of compounding, dosage,

chemical, physical and therapeutic incompatibility, packaging methods, labeling procedures, legal requirements affecting drug storage, supply and records, containers and labeling of substances and misuse of drugs.

- (d) *Community Pharmacy*.—The subject of community pharmacy is required for giving the basic knowledge of different definitions and background of community pharmacy, importance of communication with patients, imparting knowledge about different methods used to control drug abuse and misuse and for identifying the role of pharmacist as public health educator in the community for drug monitoring and information.
- (e) *Hospital Pharmacy*.—The objective is to educate the students about the real role of a pharmacist in hospital along with the roles that he/she is required to play in the distribution, storage and purchase of drugs in the hospital. The role of Pharmacy and Therapeutic Committee and the advantages of small scale manufacturing in hospital need to be highlighted.
- (f) *Clinical Pharmacy*.—Clinical pharmacy is the practice of pharmacy in clinical setting especially in a hospital. The concept of clinical pharmacy and the role that the pharmacists are playing internationally is to be introduced. Study of clinical pharmacy is important in therapeutic drug monitoring, determining toxicities, drug interactions, adverse drug reactions and dosage regimen establishment. It helps in proper selection of drugs, administration route, as well as guiding patients about the drug therapy. The students need to learn the concept of rational use of drugs, essential drugs and their advantages, drug utilization evaluation and review, practical pharmacokinetics and the role of pharmacist in pharmaceutical care, its scope, management and application.
- (g) *Biopharmaceutics and Pharmacokinetics*.—The concepts of bioavailability and administration, absorption, distribution, metabolism and excretion of drugs are required to study the drug pharmacokinetic parameters, dosage regime design, therapeutic drug monitoring, invivo evaluation of drugs and bioavailability studies. This also required for population pharmacokinetics, determination of frequency, duration and quantity of drugs given for particular disease and schedule of drugs in various ailments and in different age groups.

- (h) *Industrial Pharmacy*.—By studying this subject, the students are required to understand as to how different dosage forms at large scale are manufactured. Study of techniques for preparation of these dosage forms, latest advances in product formulation, techniques and technology for their production, is important for understanding the industrial pharmacy.
- (i) *Pharmaceutical quality management*.—The concept of quality control and quality assurances is very important. The purpose is to educate the students about the understanding of the testing, quality control and methods adopted in a pharmaceutical industry for the dosage form control, process control, testing program and methods which include physical, chemical and biological tests and specifications and statistical quality control.
- (j) *Marketing and Management*.—Pharmaceutical marketing and management enables the students to learn about different principles of management and marketing. This prepares the students as how to manage different tasks, planning of objectives, how to manage long term and short term targets in industry, marketing and retail set-ups, strategies to accomplish different goals and management of different tasks within a specified period of time.
- (k) *Forensic Pharmacy*.—Study of this subject shall enable the students to become aware about the regulatory control of manufacturing and sale of drugs in Pakistan. The students should know about the laws and procedures regarding Registration and sale of drugs, establishment of retail, wholesale and distribution set ups. Knowledge of Rules and legislation about controlled, poisonous and dangerous drugs has also to be given.
- (l) *Pharmaceutical Technology*.—The students need to learn the techniques and methods of formulation development especially with reference to advanced formulation techniques, novel drug delivery system. Introduction of pharmaceutical bio-technology and role of pharmacist in the development of different useful biotechnological products is also important.
- (m) *Pharmaceutical Microbiology*.—Students shall be taught the principles of Microbiology with special reference to Pharmaceutical Microbiology including environmental Microbiology and other relevant aspects. The

modern concepts of microbiological application shall be taught to students. The staining of slides and preparation of culture media, etc., including microbiological assays of pharmaceuticals shall be taught. Sensitivity test and other necessary pharmaceutical tests shall also be included. The students have to be trained about sterilization, disinfection and fermentation with reference to their use and application in the pharmaceutical industry. Knowledge of immune system is also required to be imparted.

14. Guidelines regarding syllabi and subjects objectives for pharmaceutical chemistry.—The following guidelines are recommended regarding syllabi and subject objectives for pharmaceutical chemistry, namely:—

- (a) *Biochemistry*.—Students shall be taught those areas of biochemistry which are important for the understanding of metabolic disorders relevant to common disturbances of body functions, gene structure and functions. General introduction and basic biochemistry of proteins, carbohydrates, bioenergetics, lipids, etc., including biochemistry of enzymes and metabolic fate of nitrogen shall also be taught. The syllabus also includes replication and expression of genetic information. Metabolic basis of biochemistry in relation to human metabolism, digestion and intestinal absorption shall also be taught. Experimental work in biochemistry shall highlight the important clinical applications of biochemical tests. The use of modern equipment for biochemical analysis shall be demonstrated to the students.
- (b) *Organic Chemistry*.—By studying this subject, the students will understand different organic reactions and their mechanisms. Knowledge about different organic molecules, their use in pharmacy and basic terms and techniques in organic chemistry will be highlighted.
- (c) *Pharmaceutical Instrumentation*.—Study of this subject shall give knowledge about different techniques used for the estimation of drugs. Students will also give the basic knowledge regarding the components of these techniques. They will also learn the analysis of drugs by using latest techniques including theory and instrumentation of atomic absorption and emission spectroscopy, flame photometry, I.R., Mass, NMR, UV/Visible spectroscopy. It will also include the study of column, thin layer, gas-liquid chromatography, HPLC and GC-MS. Potentiometry, polarography, radiochemical techniques and differential scanning colorimetry.

- (d) *Medicinal Chemistry*.—Study of this subject shall cover the theory of drug action, stereochemistry and drug action, alkaloids, vitamins and relation of structure and biological activity of organic medicinal agents. Protein and steroidal hormones, antibiotics, and synthetic drugs of different pharmacological activity shall be included.

15. Guidelines regarding syllabus and subject objectives for Pharmacognosy.—The study of Pharmacognosy is to give knowledge about crude drugs, their cultivation, evaluation and use etc. Different methods used for extraction and purification of crude drugs from different plant and animal source. The study shall include medicinal plants of Pakistan, their habitat, collection and biological source of the drug. Allergens and allergenic preparations, enzymes, plant growth hormones as well as pesticides and poisonous plants with special reference to Pakistan shall also be included. Separation and isolation of plant constituents by special techniques like chromatography, ion exchange, electrophoresis and high performance liquid chromatography (HPLC) shall be introduced. Detailed study of carbohydrates and related products, alkaloids, volatile oils, fixed oils, tannins, glycosides, etc., shall be included. The students should know the Unani system of medicine, phyto-pharmacology, Traditional Medicine and Alternative System of Medicine.

16. Guidelines regarding syllabus and subject objectives for Pharmacology.—The teaching of Pharmacology shall be aimed at different aspects of drugs and Pharmaceuticals used in different diseases. The therapeutic/ pharmacological groups of drugs will be taught according to the classification of World Health Organization. The students should know the relationship between drug concentration and biological response, drug action overtime, factors affecting absorption, distribution, binding, metabolism and elimination of chemicals, structure activity relationship, biological changes that result from repeated drug use, tolerance, addiction and adverse effects. Process of drug interaction with cellular macromolecules to alter physiological function and site of action including knowledge about proper selection of drugs has also to be covered.

17. Assessment of population needs, etc.—An assessment of population needs is essential for the provision of appropriate health services, identification of priority health problems, the influence of environmental and social factors on diseases, the prevention of illness and the promotion of health, are especially important. These issues are relevant to many subjects, and shall be addressed by all disciplines of pharmacy. Teaching must be supplemented by practical involvement of students in research and community pharmacy projects, and actual exposure to health problems of different sections of the population. Identification of problems shall be followed by planning, implementing, monitoring and evaluating appropriate interventions.

CHAPTER VI**EXAMINATIONS**

18. Objectives of evaluation through examinations.—(1) Evaluation shall be an essential part of the education process. There shall be regular internal evaluations. Students shall be evaluated in all the three cognitive, psychomotor and affective domains as specified in Chapter II. All pharmacy institutions shall uniformly apply the principles of internal evaluations.

(2) The purpose of evaluation through examination shall be,—

- (a) to give feed back to students about their understanding of the course. This purpose can be achieved by regular internal assessment of students concerning each assignment or course of study;
- (b) to certify that students have successfully completed the training and have achieved the objectives of educational program;
- (c) to determine the success of teaching program; and
- (d) to motivate and encourage students to direct their own learning.

(3) In order to achieve the objectives of evaluation through examinations, it shall be mandatory to adopt the following processes, namely:—

- (a) Continuous internal evaluation shall consist of examination at the end of each assignment, term or course of study;—
- (b) proper records of internal evaluations shall be maintained;
- (c) scores obtained in internal evaluation shall contribute towards the real assessment of annual/semester examination;
- (d) no student shall be allowed to sit in the next Professional examination without passing the previous Professional examination in all subjects;
- (e) any student who fails to pass the first Professional examination in five chances availed or un-availed, shall cease to pursue further pharmacy education;
- (f) no student shall be eligible for a university examination without having attended seventy five per cent of the lectures and practicals;

- (g) whatever may be the system of marking, for all examinations throughout Doctor of Pharmacy Degree Course, the percentage of pass marks in each subject shall not be less than fifty per cent both in theory and practical;
- (h) no grace mark shall be allowed in any examination;
- (i) there shall not be more than two examinations in a year;
- (j) 40% of the written examinations shall consist of multiple choice questions (MCQs), and the rest 60% of the short structured essays, extended essays, etc;
- (k) external examiners shall always be associated with local or internal examiners for the written, oral and practical parts of Professional examination;
- (l) a student who appears for examination in any subject and passes in theory but fails in practical or *vice versa*, shall reappear only in theory or, as the case may be, in practical in which he fails;
- (m) a student who appears for examination in any subject and fails both in theory as well as practical, shall have to reappear in both theory and practical; and
- (n) a student who appears in a Professional examination and passes in one or more subjects shall not have to reappear for examination in such subjects provided that he passes the subjects in which he fails in a stipulated time period.

CHAPTER VII

EDUCATIONAL FACILITIES

19. **Requirement of educational facilities.**—In order to impart good education there shall be provided and maintained adequate educational facilities at pharmacy institutions particularly in the following fields, namely:—

- (a) *Teaching staff.*—Properly qualified and properly committed teaching staff shall be provided on the basis of a minimum teacher student ratio of 1:10. Pharmacy institutions shall have a faculty development plan and a career structure. Good teachers shall be rewarded appropriately.

Teachers shall be provided with adequate support staff and equipment including access to computers. Pharmacy institutions shall develop organized teacher's exchange programs with other pharmacy institutions at home and abroad. Training programs for teachers shall be compulsory. All the permanent faculty members must have first degree in pharmacy and a valid registration with the Pharmacy Council. The institution shall allocate suitable funds enabling their permanent faculty members to attend at least two scientific moots in a year in the relevant fields for the purpose of "Continued Education" within the country or abroad.

- (b) *Education.*—Pharmacy education shall be imparted as a science which supports development of faculty; and a facility which supports functions of faculty as educators, and students as learners. Educational activities shall involve determination of strategy, use of large variety of audio-visual aids, teaching techniques and computers. A large number of principles of learning have to be applied to the design and practice of teaching. Objective oriented and properly structured evaluation techniques shall be made to become an integral part of the educational process.
- (c) *Physical facilities.*—Lecture theaters shall have adequate physical facilities for the whole class.
- (d) *Conference rooms.*—Conference rooms shall be available to promote teacher-student interaction which is necessary for developing and promoting habits of group activity and team- work.
- (e) *Laboratories.*—Laboratories shall be well-equipped with both simple and high technology for demonstration and experimentation and may be mono-disciplinary or multi-disciplinary.
- (f) *Libraries.*—Libraries shall be comfortable and well stocked with standard reference printed matter including access to journals. Libraries shall also include books on humanities, community problems, psychology, occupational health, etc. Library Science shall be utilized to train students in proper reading habits and use of library. Audio-visual libraries shall be developed. Dedicated internet facilities shall also be provided.

- (g) *Research*.—Every pharmacy institution must provide training in research methodology and support properly defined and funded research studies relevant to the needs of Pakistan. Special efforts shall be made to involve students in research activities.
- (h) *Evaluation*.—Pharmacy institutions shall develop structured and supervised Doctor of Pharmacy Degree Course with an organization within the faculty to ensure appropriate selection, training and evaluation of students. A system for internal evaluation of training program, and appropriate and adequate facilities for teaching in Doctor of Pharmacy Degree Course shall also be ensured.
- (i) *Community oriented health care*.—Community health facilities like Basic Health Units (BHUs) shall be acquired in the vicinity of pharmacy institutions either on the basis of integration or collaboration, for conducting part of the clinical training. For the practice of proper community-oriented health care, students shall actually participate in the primary health care of community under the guidance of clinical teachers in various disciplines. It is essential that students develop the concept of integrated problem-based health care to deal with common health problems in real community environments.
- (j) *Finance*.—Adequate financial provision shall be made for the maintenance and development of pharmacy institution.
- (k) *Head/Dean/Chairman*.—The head of the pharmacy institution/ Dean /Chairman/Principal/Director of a pharmacy institution and chairmen of all departments shall hold a first degree in pharmacy.
- (l) *Administrative organization*.—The administrative organization of pharmacy institution shall be prompt, effective and problem solving in the form of a governing body.
- (m) *Study tours and field visits*.—Study tours and field visits shall be organized during the course of studies at appropriate intervals.

CHAPTER VIII

EXTRA-CURRICULAR ACTIVITIES AND WELFARE PROGRAMMES

20. Extra-curricular activities and welfare programs.—In order to have comprehension policy of pharmacy institution there shall be clearly defined extra-curricular activities and welfare programs for the students, such as—

- (a) Sports Club;

- (b) Literary Society;
- (c) social welfare activities, conducted tours, community organization, etc;
- (d) students counseling services to deal with such problems as substance abuse;
- (e) motivation against political exploitation;
- (f) teacher-student organizations like tutor system, monitor system, practical system and hostel management committees formed on the basis of talent;
- (g) student's group insurance system and benevolent fund;
- (h) proper awards and adequate scholarships for purpose of incentives and assistance;
- (i) student health services;
- (j) student exchange programs with other institutions at home and abroad;
- (k) proper hostel accommodation;
- (l) transport facilities;
- (m) language training programs for proficiency in English language on voluntary basis;
- (n) Information technology; and
- (o) Drug Information and Poison Control centre.

CHAPTER IX

COURSES OF STUDY AND DISTRIBUTION OF SUBJECTS AND PRACTICALS FOR DOCTOR OF PHARMACY DEGREE COURSE

21. **Courses of study for Doctor of Pharmacy Degree Course.—(1)**
The duration of Doctor of Pharmacy Degree Course shall be five years.

(2) The courses of study for Doctor of Pharmacy Degree Course shall be split into the First Professional, Second Professional, Third Professional, Fourth Professional and Final Professional, each of which shall be of one year duration.

22. Distribution of subjects and practical for the First Professional Examination.—The distribution of various subjects and practical for the First Professional of Doctor of Pharmacy Degree Course shall be as specified in column (3) of the table below and the relevant examination paper number as specified in column (2) of the said table and the relevant marks for each paper as specified in column (4) thereof, namely:—

TABLE
FIRST PROFESSIONAL

S. No.	Paper No.	Description	Marks
(1)	(2)	(3)	(4)
SUBJECTS			
1.	I	Pharmaceutical Chemistry-I (Organic)	100
2.	II	Pharmaceutical Biochemistry.	100
3.	III	Pharmaceutics-I (Physical Pharmacy)	100
4.	IV	Physiology and Histology	100
5.	V	Anatomy	50
6.	VI	Pharmaceutical Mathematics & Biostatistics	100
PRACTICALS			
7.	VII	Pharmaceutical Chemistry-I (Organic)	100
8.	VIII	Pharmaceutical Biochemistry.	100
9.	IX	Pharmaceutics-I (Physical Pharmacy)	100
10.	X	Physiology & Histology	100

23. **Distribution of subjects and practical for the Second Professional.**—The distribution of subjects and practical for the Second Professional of Doctor of Pharmacy Degree Course shall be as specified in column (3) of the table below and the relevant examination paper number as specified in column (2) of the said table and the relevant marks for each paper as specified in column (4) thereof, namely:—

TABLE
SECOND PROFESSIONAL

S. No.	Paper No.	Description	Marks
(1)	(2)	(3)	(4)

SUBJECTS

1.	I	Pharmaceutics-II (Pharmaceutical Preparations)	100
2.	II	Pharmacology and Therapeutics-I	100
3.	III	Pharmacognosy-I	100
4.	IV	Pharmaceutica ¹ Microbiology	100
5.	V	Pakistan Studies and Islamiat (Comp.)	100

PRACTICALS

6.	VI	Pharmaceutics-II. (Pharmaceutical Preparations)	100
7.	VII	Pharmacology & Therapeutics-I.	100
8.	VIII	Pharmacognosy-I.	100
9.	IX	Pharmaceutical Microbiology	100

24. **Distribution of subjects and practical for the Third Professional.**—The distribution of subjects and practical for the Third Professional of Doctor of Pharmacy Degree Course shall be as specified in column (3) of the table below and the relevant examination paper number as specified in column (2) of the said table and the relevant marks for each paper as specified in column (4) thereof, namely:—

TABLE
THIRD PROFESSIONAL

S. No.	Paper No.	Description	Marks
(1)	(2)	(3)	(4)
SUBJECTS			
1.	I	Pathology	50
2.	II	Pharmacology & Therapeutics-II	100
3.	III	Pharmacognosy-II.	100
4.	IV	Pharmaceutical-III (Dispensing & Community Pharmacy)	100
5.	V	Pharmaceutical Chemistry-II (Instrumentation)	100
PRACTICALS			
6.	VI	Pathology	50
7.	VII	Pharmacology & Therapeutics-II	100
8.	VIII	Pharmacognosy-II	100
9.	IX	Pharmaceutics-III (Dispensing & Community Pharmacy)	100
10.	X	Pharmaceutical Chemistry-II (Instrumentation)	100

25. Distribution of subjects and practical for the Fourth Professional.—The distribution of subjects and practical for the Fourth Professional of Doctor of Pharmacy Degree Course shall be as specified in column (3) of the table below and the relevant examination paper number as specified in column (2) of the said table and the relevant marks for each paper as specified in column (4) thereof, namely:—

TABLE
FOURTH PROFESSIONAL

S. No.	Paper No.	Description	Marks
(1)	(2)	(3)	(4)

SUBJECTS

1.	I	Pharmaceutics-IV (Hospital Pharmacy)	100
2.	II	Pharmaceutics-V (Clinical Pharmacy-I)	100
3.	III	Pharmaceutics-VI (Industrial Pharmacy)	100
4.	IV	Pharmaceutics-VII (Biopharmaceutics)	100
5.	V	Pharmaceutics-VIII (Pharmaceutical Quality Management)	100

PRACTICALS

6.	VI	Pharmaceutics-V (Clinical Pharmacy-I)	100
7.	VII	Pharmaceutics-VI (Industrial Pharmacy)	100
8.	VIII	Pharmaceutics-VII (Biopharmaceutics)	100
9.	IX	Pharmaceutics-VIII (Pharmaceutical Quality Management)	100

26. Distribution of subjects and practical for the Final Professional.—The distribution of subjects and practical for the Final Professional of Doctor of Pharmacy Degree Course shall be as specified in column (3) of the table below and the relevant examination paper number as specified in column (2) of the said table and the relevant marks for each paper as specified in column (4) thereof, namely:—

TABLE

FINAL PROFESSIONAL

S. No. Paper No.		Description	Marks
(1)	(2)	(3)	(4)

SUBJECTS

1.	I	Pharmaceutical Chemistry-III (Medicinal Chemistry)	100
2.	II	Pharmaceutics-IX (Clinical Pharmacy-II)	100
3.	III	Pharmaceutical Technology	100
4.	IV	Forensic Pharmacy	100
5.	V	Pharmaceutical Management & Marketing	100
6.	VI	Computer and its Application in Pharmacy	50

PRACTICALS

6.	VI	Pharmaceutical Chemistry-III (Medicinal Chemistry)	100
7.	VII	Pharmaceutics-IX (Clinical Pharmacy-II)	100
8.	VIII	Pharmaceutical Technology	100
9.	IX	Computer and its Application in Pharmacy	50

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Sd/-
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Deputy Secretary.