BDS SECOND PROFESSIONAL EXAMINATION 2007
COMMUNITY AND PREVENTIVE DENTISTRY (SEQs)

Model Paper

Marks: 45 **Time: 2 hours 15 min**
Note: 3 marks for each SEQ
Total No. of SEQs 15

Q.1 What is a balanced diet? What are the nutritional problems in public health?

Topic Specification: Balanced Diet

KEY:

Balanced Diet: 1

It can be defined as diet which contains a variety of foods in such a quantities and proportions that the need of energy, amino acids, fats, carbohydrates, vitamins, minerals and other nutrients is adequately met for maintaining health.

Following principles should be kept in mind while prescribing a balanced diet:

1. 15-20% of the daily energy intake should be from the protein.
2. 20-30% of the energy intake should be from the fats.
3. Rest of the energy intake should be from the carbohydrates rich in natural fibres.

Nutritional Problems in Public Health: 2

1. Low birth weight.

   Low birth weight (less than 2.5kg) is major public health problem. The causes of low birth weight are:

   a. Maternal malnutrition and anemia.
   b. Physical labour during pregnancy.
   c. Illness.

2. Protein Energy Malnutrition:

   It is a major health and nutritional problem in developing countries like Pakistan. Kwashiorkor and Marasmus are the examples of protein energy malnutrition (PEM) which is due to protein deficiency. Main causes of MEP are:

   a. Inadequate intake of food both in quantity and quality.
   b. Infection like dirrhoea, measles, and respiratory infections.

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c. Contributary factors like poor environment conditions, large family size, poor maternal health, premature termination of breast feeding.

3. Xerophthalmia:
   - All the ocular manifestation of vitamin A deficiency.
   - Most common in children aged 1-3 years.
   - The victims are from poorest families.

4. Nutritional Anemias:

WHO define nutritional anemia as "a condition in which haemoglobin content of blood is lower than normal as a result of a deficiency on one or more essential nutrients. Main causes are iron deficiency and vitamin B_{12} deficiency.

5. Iodine Deficiency Disorder (IDD):

The most obvious consequence of iodine deficiency is goiter. The others are:

i. Hypothyroidism
ii. Retarted physical development.
iii. Impaired mental function
iv. Increase rate of spontaneous abortions.
v. Neurological cretinism.

6. Flourosis

Endemic flourosis has been observed in many part of the world which have excessive amount of flourine in drinking water.

Dental Flourosis: "Mottling" of dental enamel occur when excess amount of fluoride is ingested during tooth calcification. In severe cases loss of enamel gives corroded appearance.

Skeletal Flourosis: There is heavy deposition of fluoride in the skeleton which causes brittleness of the long bones.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.2 Classify dental auxilaries. What are the functions of dental hygienist?

Topic Specification: Dental Auxilliries

KEY:

Dental Auxillary: 1

A person who help the dentist to provide dental care.

Classification:

1. Non-operating auxillaries.
2. Operating auxillaries.

Non-operating Auxillaries:

1. Dental surgery assistant.
2. Dental secretary/ receptionist.
3. Dental laboratory technician.
4. Dental health educator.

Operating Auxillaries:

1. School dental nurse.
2. Dental therapist.
3. Dental hygienist.
4. Expanded function dental auxillaries.

Functions of Dental Hygienist 2

1. Scaling and polishing of teeth.
2. Oral health instructions.
3. Topical applications of fluoride.
4. Examination of school children for referral to dentist.
5. Resource work in field of dental health.

He can also perform some procedures like extraction of decidious teeth, impression taking, placement of temporary crowns and bridges, sedatine filling under the supervision of dental surgeon.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.3 What is scoring criteria and treatment need of CPITN (community periodontal index of treatment need)?

Topic Specification: Indices of Oral Disease

KEY:

Scoring criteria and treatment need of CPITN: 3

Scoring Criteria	Treatment Need
0 = Healthy Periodontium X = when only one tooth or no teeth are present in a sextant.	0 = No treatment needed
1 = Bleeding during or after gentle probing, calculus or pocketing not present	I = Oral hygiene needs improvement.
2 = Calculus presents during probing but the entire black band of probe is visible.	II = I + professional scaling.
3 = Pathological pocket of 3.5 – 5.5 mm, but a part of colored band is visible. No need of recording calculus or bleeding.	II = I + professional scaling. i.e. treatment need for criteria 2 and three is same.
4 = Pocket more than 6 mm is present. The colored band of CPITN probe is not visible.	III = I + II + complex treatment like root planning under local anesthesia, gingivectomy or flap operations etc.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.4 What are the similarities between personal and community health care?

Topic Specification: Dental Public Health

KEY:

Similarities between personal and community health care are: **3**

Personal	Community
1. Examination: It includes personal history, past medical history, clinical observation and investigations. Then a clinical assessment is made.	1. Survey: Clinical assessment, extent and severity of disease in population is made by a survey.
2. Diagnosis: After examination diagnosis is made.	2. Analysis: Here diagnosis comes from analysis of the survey data.
3. Treatment Planning: Treatment plan is made with the consent of the patient.	3. Program Planning: A careful program is planned so that community accepts it.
4. Treatment: Treatment is scheduled to carryout.	4. Program Operations: Public health team may be called on for program operation.
5. Payment: Method of payment is in between patient and dentist.	5. Program Funding: Local state, federal funds from government and NGO's sponsored program.
6. Evaluation: Records before and after the treatment should be available.	6. Program Appraisal: Data collected in the initial survey as baseline against which a program appraisal can be made to assess the effectiveness.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.5 How you will plan a dental health education program?

Topic Specification: Health Education.

KEY:

Planning a dental health education program: 3

Before starting a dental health education program we should have to keep in mind the following points:

1. Collect Background Information: Relevant information and correct scientific facts which are to be communicated.
2. Define Target Population: Irrelevant groups should not be included.
3. Assessment of Baseline Knowledge: Give information that what a target group wants to know. Avoid information which they already know.
4. Level of Literacy: It is essential to know the population level of literacy so that appropriate educational techniques are utilized.
5. Define Objectives: Objectives should be precise and clear in terms of knowledge and behavior that are expected from the target group.
6. Assess Resources: Necessary facilities and personnel should be available to carry out the program.
7. Pilot Study: A small scale study is conducted so that problems can be discovered and necessary modification can be made before the main program is initiated.
8. Timing of Program: Special consideration should be given to timing to ensure the availability of target population.
9. Evaluation: Evaluation of the program should be made during the program (midterm evaluation) and at the end of the program (end term evaluation).

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.6 What are the benefits of water fluoridation? Give its feasibility.

Topic Specification: Fluorides in Carries Prevention

KEY:

Benefits of Water Fluoridation: 2

1. Appearance of Teeth: Teeth exposed to an optimum level of fluoride are clear, white, shiny, opaque, and without blemishes.
2. Dental Carries Reduction:
   - 40% to 50% reduction in primary teeth.
   - 50% to 60% reduction in permanent teeth
3. Root Carries Reduction: Approximately 50% reduction with lifelong consumption of fluoridated water.
4. Reduction in Tooth Loss: 75% reduction in the prevalence of extracted first molar in fluoridated area is observed as compared with non fluoridated.
5. Malocclusion: Orthodontic problems are approximately 20% less prevalent among children 6-14 years of age living in fluoride area.
6. Economy: Water fluoridation is most economical in reducing the cost of public health expenditure as compare to other means of fluoride usage like fluoride tablets, school dentifries.

Feasibility of Water Fluoridation: 1

Water fluoridation is feasible only if:

1. There is municipal water supply.
2. People drink this water rather than water from wells or rain water tanks.
3. Suitable equipment is present.
4. Supply of fluoride is assured.
5. Workers are available to maintain the system and keep records.
6. Funds are available, for the initial installation and running cost.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.7 What is Vipeholm Study? Give its conclusions.

Topic Specification: Epidemiology of Oral Diseases.

KEY:

Vipeholm Study: 1.5

- It was conducted by Gustafssom et al in 1954.
- A five year study on 436 adults in a mental institute at Vipeholm hospital, Sweedon.
- The experimental adults were divided into seven groups:
    i. Control group.
    ii. Sucrose group.
    iii. Bread group.
    iv. Chocolate group.
    v. Caramel group.
    vi. 8 toffee group.
    vii. 24 toffee group.

Conclusion of the Study: 1.5

i. Increase in carbohydrate increased the level of dental caries.
ii. Increased risk of caries if food was retained on tooth surface.
iii. Risk of caries was greater if sugar was taken between meals.
iv. The increase of caries activity varies between individuals.
v. Withdrawal of sugar rich food decreases the caries activity.
vi. Physical form and frequency of intake is more important in cariogencity than total amount ingested.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.8 Define Mean, Median and Mode with examples.

Topic Specification: Biostatistics

KEY:

Mean: **1**

Mean or Arithmetic mean is most commonly used measure, and it is obtained by summing up the values of all observations, divided by total number of observations.

$X = X_1 + X_2 + X_3 + \ldots\ldots\ldots\ldots X_n/n$

$\overline{X} = Sx/n$

Mean is denoted by $\overline{X}$ (X bar)

Example: the fasting blood glucose level of a sample of 10 people is 56, 62, 63, 65, 65, 65, 65, 68, 70, and 71. So mean is = 650/10, = 65

- The main advantage of mean is easy to calculate and understand.
- The disadvantage of mean is that it is affected by extreme values.

Median: **1**

Median is the value which divides the distribution in such a way that equal number of observations lie on either side of it. To obtain the median, first data is arranged in ascending nor descending order of magnitude and the value of middle observation gives the median value.

Example: Number of children in 5 families is 4, 2, 4, 3, and 1. Arranging the observations in ascending order 1, 2, 3, 4, 4.

So median = 3. If the number of observations is even, then average of middle two observations gives median.

The main advantage of median is that it is not affected by extreme values.

Mode: **1**

Mode is that value which occurs with the greatest frequency. A distribution may have more than one mode,

Example: Diastolic blood pressure of 10 individuals is: 85, 75, 81, 79, 71, 80, 75, 78, 72, and 73.

Here mode is 75.

If observations are 85, 75, 81, 79, 80, 71, 80, 78, 75, and 73 than mode = 75 and 80.

Note: Students can give other examples.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.9 a. What are the reasons for using Hand Instruments in Atraumatic Restorative Treatment (ART)?
b. Give contraindications of ART.

Topic Specification: Atraumatic Restorative Treatment

KEY:

a. Reason of using hand instruments rather than electric driven hand pieces: 1.5

i. It makes the restorative accessible to all population groups.
ii. It is a biological approach, which requires minimal cavity preparation. So causes less trauma to the teeth.
iii. The cost of hand instruments is very low as compared to electrically driven dental equipments.
iv. There is no need of local anesthesia for cavity preparation.
v. It reduces the chances of psychological trauma to patients.

b. Contraindications of ART 1.5

i. If there is presence of swelling or fistula near the oral cavity.
ii. Exposure of pulp.
iii. Painful teeth with chronic inflammation of the pulp.
iv. If the opening of the cavity is not accessible to hand instruments.
v. Proximal cavity having no access either from proximal or the occlusal side.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.10 What is Aetiology of oral cancer? 3

Topic Specification: Oral Cancers/ Epidemiology of Oral Diseases.

KEY:

Oral Cancer: it is an indurated, ulcerated lump or sore that may of may not be painful and is often associated with lymphadenopathy. About 90% of oral cancers are squamous cell carcinomas.

Aetiology: The main cause of oral cancer is Tobacco which may be in smoking form or smokeless form.

Smoking form of Tobacco:

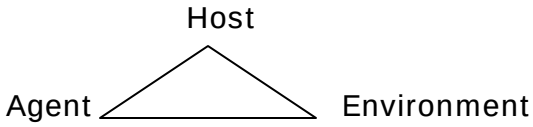
- Bide.
- Cigarettes.
- Chillum.
- Cigar.
- Hookah.
- Hookli.

Smokeless Tobacco: It may be in the form of

- Mainpuri tobacco.
- Mawa.
- Mishri.
- Paan.
- Snuff.

In Pakistan the oral cancer is very common in areas of NWFP, Balochistan and in urban areas of Pakistan like Karachi and Lahore where Paan, Snuff and Bidi is the main cause.

Contributory Factors of Oral Cancer: These can be easily understand by the epidemiological triad of oral cancer.



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A. Host Factors:

1. Age: Sarcoma is more common in younger age. Carcinoma is more common in old age.
2. Race: Whites have melenoma while Black have odentogenic tumors.
3. Sex: Lip cancer – more in women than male.
   Malignant melenoma – Women.
   Cancer of Tongue and buccal mucosa – Male
4. Genetic Factor: Now it is possible to identify the genetic element involved in the initiation of malignant diseases.
5. Immunity: Kaposi's sarcoma is more in AIDS patients.
6. Social Class: more in poor.
7. Custom and Habits: Smoking, bide, Snuff, Paan chewing. (Tobacco in any form which act as agent factor is the major cause of oral cancer).

B. Agent Factors:

1. Biological
   - Virus (HIV, HSV)
   - Fungal (Candidiasis)
2. Chemical: Arsenic, nickel, chromium.
3. Mechanical: Sharp tooth, ill fitting dentures, crowns and bridges.
4. Nutritional Agents:
   - Precarcinogins in food (Saccharin, aflatoxin)
   - High intake of fatty food.
   - Deficiency of folic acid, protein, copper, zinc and Vitamin E & C.
   - Increased consumption of red chili.

C. Environmental Factors:

1. Water Contamination: organic pollution like chloroform.
2. Air Pollution: Gases like CO_2 from automobiles and factories.
3. Solar Heat: Melenoma is caused by prolonged exposure to sunlight.
4. Industrialization: The release of various toxins from industries contaminates water and air, which may lead to cancer.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.11 a. Classify the methods of plaque control.

b. What is the role of Abrasives and Detergents (foaming agents) in a dentifrice.

Topic Specification: Prevention of Periodontal Diseases

KEY:

a. Classification of Dental Plaque Control: 2

1. Mechanical Plaque Control.
2. Chemical Plaque Control.

Mechanical Plaque Control:

i. Tooth Brushes
   - Manual tooth brushes.
   - Electric tooth brushes or powered tooth brushes.

ii. Interdental Oral Hygiene Aids
   - Dental floss.
   - Dental floss holder.
   - Gauze strips.
   - Interdental tip stimulator.
   - Toothpick.
   - Toothpick holder.
   - Interdental brush.
   - Tongue cleaner.
   - Knitting yarn.

iii. Dentifrices
   - Cosmetic dentifrices.
   - Therapeutic dentifrices.

Chemical Plaque Control:

i. Antibiotics.
ii. Phenols.
iii. Quaternary Ammonium compounds
iv. Bisbiguanides.
v. Enzymes.
vi. Metalic salts
vii. Oral irrigation devices.

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Model Paper

b. Role of Abrasives and Detergents: 1

Abrasives: Calcium carbonate and calcium phosphate were previously used as abrasive. Now silicon oxide, aluminum oxide granular polyvinyl chlorides are used. These abrasives often make the tooth surface dull. To compensate this some shining agent are added. Small sized particles of calcium, tin, aluminum or zirconium are used which act as polishing agents.

Detergents: Sodium Lauryol sulfate and sodium N-Lauryol Sarcosinate are the detergents used which are slable and are antibacterial. They have low surface tension which facilitates the flow of tooth paste over the tooth surface.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.12 What is a Research Protocols?

Topic Specification: Biostatistics and Epidemiology.

KEY:

Research Protocols: 3

A "written research protocol" is a formal plan encompassing the purpose and the operation of the study.

A research protocol should contain these major elements:

1. A precise definition of the research problem, the reason for undertaking the research and review of previous literature.
2. Objectives of the study or hypothesis to be tested.
3. Population to be studied, including its selection, source, size and method of sampling.
4. Data to be collected, listing and describing each item needed to accomplish the objectives.
5. Procedure to be carried out, how the data will be obtained from the participants in the study and by whom.
6. Data collection methods and list of all necessary supplies, equipments and instruments.
7. Plans for data processing and analysis.
8. Budget, including salaries for study personnel, consultant or subcontract costs.
9. Time schedule.
10. Human subjects clearance: the informed consent of patient or subject who take part in the study must be obtained.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.13 a. What do you mean by Sampling? Give its types. 2
b. What is network or snowball sampling? 1

Topic Specification: Biostatistics and Epidemiology.

KEY:

Sampling: 1

It can be defined as the investigation of the part of a population, in order to provide information which can be then generalized to cover the whole population.

- When we take a sample and study it, we want to be able to draw general conclusions about the population.
- For example, if you take a spoonful of ice cream from a container and taste it, you will be able to make a general statement about how much you like that kind of ice cream. You have tested a sample. You don't have to eat the whole thing in order to make a informed opinion.

Types of Sampling: 1

Sampling is of two types:

a. Probability Sampling
b. Non-probability Sampling

Probability Sampling:

1. Simple random
2. Stratified random
3. Systemic random
4. Area/ cluster sampling

Non-Probability Sampling:

1. Accidental or convenience sampling.
2. Judgment or purposive sampling.
3. Network or Snowball sampling.
4. Quota sampling.
5. Dimensional sampling.
6. Mixed sampling.

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Network of Snowball Sampling: **1**

In this type of sampling the researcher must first identify and interview a few subjects with requisite criteria. These subjects are then asked to identify others with the same criteria. These persons may be then asked to identify others until a satisfactory sample is obtained.

This procedure is useful for finding subjects who may not be willing to make themselves known to the population; e.g. homosexuals, alcoholics, drug addicts, sex offender and child abusers etc.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q.14 Classify topical fluorides and give mechanism of action of 2% sodium fluoride as a topical solution.

Topic Specification: Fluorides and Prevention of Dental Caries.

KEY:

Classification of Topical Fluorides **1**

A. Operator Administered
   1. Fluoride Solutions
      - Sodium fluoride 2%
      - Stannous fluoride 8%
   2. Fluoride gels
      - Acdulated phosphate fluoride 1.23%
   3. Fluoride varnishes
      - Duraphate
      - Flourprotector

B. Self Administered
   - Fluoride dentifrices.
   - Sodium fluoride.
   - Fluoride mouth rinses.
   - Dentifrices containing
   - monofluorophosphate

Mechanism of action of sodium fluoride: **2**

- When sodium fluoride is applied topically, it reacts with hydroxyapatite crystal to form calcium fluoride.
- This CaF_2 is a dominant product of this reaction which is due to the high concerntration of fluoride (9000 PPM) in 2% sodium fluoride due to which the solubility product of calcium fluoride get exceeded fast. This initial rapid reaction is followed by a drastic reduction in its rate and this phenomenon is called as choking off.

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- Once a thick layer of CaF_2 is formed which interferes with the further diffusion of fluoride from the topical fluoride solution to react with hydroxyapatite.
- More and more CaF_2 reacts with the hydroxyapatite to form the fluoridated hydroxyapatite which increases the concentration of surface fluoride making the tooth structure more stable and less susceptible to acid dissolution.
- This fluoridated hydroxyapatite also interferes with plaque metabolism through anti-enzymetic action and also helps in remineralization of the initial decalcified area thus showing its anticaries effect.

Reference: Preventive and Community Dentistry by Joseph Jhon.

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Model Paper

Q15. Define an index. What are the ideal requisites of an index? 3

Topic Specification: Indices of Oral Diseases

Key:

Index: Russell A.L has defined an index as "a numerical value describing the relative status of a population on a graduated scale with definite upper and lower limits, which is designed to permit and facilitate comparison with other populations classified by the same criteria and methods".

Indics have been developed to compare the extent and severity of disease.

Ideal Requisites of an Index: Ideally an index should possess the following properties:

1. Clarity, simplicity and objectivity: An index should be simple and easy to carryout. The criteria for the index should be clear and unambiguous.
2. Validity: The index must measure what it is intended to measure, so it should correspond with clinical stages of the disease under study.
3. Reliability: The index should measure consistently at different times and under a variety of conditions.
4. Quantifibility: The index should be amenable to statistical analysis so that the status can be expressed by a number.
5. Sensitivity: It should be able to detect reasonably small shift in either direction.
6. Acceptability: The index should not be painful or demeaning to the subject.
7. It should require minimum instruments and expenditures.
8. It should be as free as possible from subjective interpretation.

Reference: Preventive and Community Dentistry by Joseph Jhon.