

### Practical Question Bank

1. Find the Thickness of a wire using wedge method
  2. Determine the wavelength of light using Biprism
  3. Find Radius of curvature of a given convex lens using Newton's rings method
  4. Find the resolving power of Prism
  5. Find dispersive power of a prism
  6. Find the specific rotation of a given sugar solution using polrimeter
  7. Determine the wavelength of light using minimum deviation method
  8. Determine the wavelength of light using normal incidence method
  9. Determine resolving power of a given telescope
  10. Find the refractive index of a given liquid using Boy's method
  11. Find the refractive index of a water using pulfrich refractometer
  12. Determine the wavelength of given laser using diffraction grating
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**B.Sc II Yr (IV Semester) Chemistry Practical Examination**  
**Paper IV- Quantitative analysis – II**  
**Question Bank**

**Question Paper Pattern:**

- A. Question for Principle Writing
- B. Main Experiment Question

**A. Questions for the Principle Writing:**

Any one among the following may be given:

1. Write the principle of conductometric titration of a strong acid vs strong base.
2. Give the principle of conductometric titration of a weak acid vs strong base.
3. Write the principle of potentiometric titration of a strong acid vs strong base.
4. Give the principle of potentiometric titration of a weak acid vs strong base.
5. Write the principle for the estimation of  $\text{Ni}^{+2}$  as  $[\text{Ni}(\text{DMG})_2]$ .
6. Give the principle for the estimation of Ba(II) by gravimetric analysis.

**B. Questions for the Main Experiment**

1. Determine the concentration of given HCl solution by a **conductometric titration** with the provided standard 0.5 M NaOH solution.
2. Determine the concentration of given NaOH solution by a **conductometric titration** with the provided standard 0.1 M HCl solution.
3. Determine the concentration of given  $\text{CH}_3\text{COOH}$  solution by a **conductometric titration** with the provided standard 0.5 M NaOH solution.
4. Determine the concentration of given NaOH solution by a **conductometric titration** with the provided standard 0.1 M NaOH solution.
5. Determine the concentration of given HCl solution by **Potentiometrically** using standard 0.5 M NaOH solution provided.
6. Determine the concentration of given NaOH solution by **Potentiometrically** using standard 0.1 M HCl solution provided.
7. Determine the concentration of given  $\text{CH}_3\text{COOH}$  solution by **Potentiometrically** using standard 0.5 M NaOH solution provided.
8. Determine the concentration of given NaOH solution by **Potentiometrically** using standard 0.1 M NaOH solution provided.
9. Estimate the amount of  $\text{Ni}^{+2}$  present in the given solution by **back titration method**. You are provided with standard  $\text{MgSO}_4$  solution 0.01M and approximately 0.01M EDTA solution.
10. Estimate the amount of Barium (II) present in the given solution by **Gravimetric analysis** using  $\text{dil. H}_2\text{SO}_4$  or  $(\text{NH}_4)_2\text{SO}_4$ .
11. Estimate the amount of sulphate as  $\text{BaSO}_4$  **Gravimetrically** in the given solution using  $\text{BaCl}_2$  solution.

**Scheme of Evaluation for questions 1-8**

<b>A. Principle Writing:</b>	<b>05 Marks</b>
<b>B. Experiment:</b>	<b>15 Marks</b> (Performing experiment and Tabulation - 06 marks, Graph - 05 marks, Calculation - 03 marks and Result – 01 mark)
<b>C. Record &amp; Viva:</b>	<b>05 Marks</b>
<b>TOTAL:</b>	<b>25 Marks</b>

**Scheme of Evaluation for questions 9,10**

<b>A. Principle Writing:</b>	<b>05 Marks</b>
<b>B. Experiment:</b>	<b>15 Marks</b> (Weighing & Standardization - 04 marks, Estimation – 04 marks, Calculation - 04 marks and Result - 01 mark)
<b>C. Record &amp; Viva:</b>	<b>05 Marks</b>
<b>TOTAL:</b>	<b>25 Marks</b>

Semester-IV- Paper IV  
Plant Anatomy, Embryology and Palynology

KEY

- I. (A) Double staining technique
  - a. Stem
    - 1. *Achyranthes*
    - 2. *Boerhaavia*
    - 3. *Bignonia*
    - 4. *Dracaena*
  - b. Root
    - 1. *Beta vulgaris*
- II. (B) Epidermal peel of leaf
  - 1. Paracytic
  - 2. Anisocytic
  - 3. Anomocytic
  - 4. Diacytic
- III. (C) Pollen Viability Test (Evens Blue)
  - 1. *Hibiscus*
- IV. (D) Embryology
  - 1. TS of Anther
  - 2. Microsporangia
  - 3. Megasporangia
  - 4. Embryo (Dicot/Monocot)
  - 5. Types of ovules
    - a. Orthotropus
    - b. Anatropus,
    - c. Campylotropus
    - d. Circinotropus
    - e. Hemi- anatropus
    - f. Amphitropus
- (E) Palynology
  - 1. *Hibiscus*
  - 2. *Acacia*
  - 3. Grass
  - 4. *Ocimum*
- (F) Anatomy (Wood structure)
  - 1. Teak (*Tectona grandis*)
  - 2. Rosewood (*Dalbergia latifolia*)
  - 3. Red sanders (*Pterocarpus santalinus*)
  - 4. Nallamaddi (*Terminalia tomentosa* )
  - 5. Neem (*Azadirachta indica*)

B.Sc. II Year  
 Zoology Practical Syllabus for IV Semester  
 Core Paper – IV  
 Cell Biology, Genetics and Evolution

**QUESTION BANK**  
**WITH EFFECT FROM 2017**

Time: 2Hrs.

Max. Marks: 25

**I. Identify , Label the diagram and write salient features of spots (04 Spots) [2x4 = 8 marks]**  
 (Identification 1 mark, Diagram and write up 1 mark)

**Museum specimens, slides/pictures**

1. Peripatus
2. Coelacanth fish
3. Lepidosiren
4. Neoceratodus
5. Protopterus
6. Sphenodon
7. Archeopteryx
8. Prophase of mitosis/meiosis
9. Metaphase of mitosis/ meiosis
10. Anaphase of mitosis/meiosis
11. Telophase of mitosis/meiosis
12. Lamp brush chromosome
13. Polytene chromosome

QII.

[4 marks]

14. Squash preparation of onion root tips and identification of mitotic stages
15. Preparation and identification of different stages of meiosis in Grasshopper testes.

**QIII. Problems on Genetics – Mendelian inheritance, Linkage and Crossing Over and Sex Linked Inheritance**

[3 marks]

16. If a plant homozygous for tall is crossed with one homozygous for dwarf, what will be the appearance of the  $F_1$ ; of the  $F_2$ ; of the offspring of a cross of  $F_1$  with its tall parent; with its dwarf parent?
17. Let the allele for tall be represented by  $T$  and the allele for dwarfness by  $t$ . what will be the gametes produced by the parents and the height of the offspring (tall or dwarf) from each of the following crosses:  $Tt \times tt$ ;  $TT \times Tt$ ;  $Tt \times Tt$ ?
18. A certain polled bull is bred to three cows. With cow A, which is horned, a polled calf is produced; with cow B, also horned, a horned calf is produced; with cow C, which is polled, a horned calf is produced. What are the genotypes of the four parents, and what further offspring, in proportions would you expect from these matings? In cattle, the polled or hornless condition  $P$  is dominant over the horned,  $p$ .
19. Assume that a wild-type female *Drosophila*,  $BB\ SS$ , with normal gray body and red-coloured eyes is mated with a mutant-type male,  $bbss$ , with black-body colour and sepia-coloured eyes. By following the general directions, determine the  $F_1$  genotype. After mating  $F_1 \times F_1$ , what classes of flies may be expected in the  $F_2$  generation?
20. Which in each of the following ascospore arrangements in *Neurospora*, indicate first-division segregation or second-division segregation?

+	+	C	C	+	+	C	C
C	C	+	+	+	+	C	C
C	C	C	C	+	+	+	+
+	+	C	C	C	C	+	+

21. Suppose that in a *Neurospora* cross genes *x* and *y* are segregating. If the following spore arrangements were found. What would you conclude as to the location of *x* and *y*?

++	++	xy	xy	57
xy	xy	++	++	60

22. From the data below, calculate the cross over value between black and grey:

I. Black straight x grey are  
F1 x black are 0 0 gives:

Grey straight	281
Grey are	335
Black straight	335
Black are	239

II. Black are x wild type  
F1 x black are 0 0 gives:

Grey straight	1,641
Grey are	1,254
Black straight	1,180
Black are	1,532

23. A woman whose father was haemophilic, but who is not herself a bleeder, marries a normal man. What is the chance of haemophilia in their children?
24. If parents with normal vision produce normal and colour-blind sons, what proportion of the daughters will be heterozygous for colour-blindness?
25. A girl of normal vision whose father was colour-blind marries a man of normal vision whose father was also colour-blind. What type of vision can be expected in their offspring?

#### QIV. Problems from evolution

[3 marks]

26. Suppose a South Sea Island population started with 10% blue-eyed and 90% homozygous brown-eyed people. Under the Hardy-Weinberg rule what will be at equilibrium the percentages of heterozygotes? Of each type of homozygote?
27. Suppose a population has 100% of people with blood group type AB. What will be the blood group situation at equilibrium, assuming the Hardy-Weinberg law obtains?
28. Under the Hardy-Weinberg law, what is the frequency of gene '*P*' if its only allele '*p*' is homozygous in 49% of the population?

#### QV. Certified practical Record

[3 marks]

#### QVI. Album [Genetics and Evolution – Photographs; Cut Outs with Appropriate Write Up]

[2 marks]

- Lamp brush and polytene chromosomes
- Study of homology and analogy from suitable specimens and pictures.
- Macro evolution using Darwin finches (Pictures)

#### QVII. Viva – Voce

[2 marks]

B.Sc. II Year  
B.Sc. PRACTICAL MODEL PAPER FOR IV SEMESTER  
ZOOLOGY - CORE PAPER - IV  
Cell Biology, Genetics and Evolution

**Time: 2 Hrs.**

**Max. Marks: 25**

- |   |    |
|---|----|
| 1. Identification, labeled diagram and salient features of spots:<br>(04 spots) | 8  |
| 2. Prepare and Identify Mitotic divisions with onion root tips:                 | 04 |
| 3. One Problem from Genetics  | 03 |
| 4. One Problem from Evolution   | 03 |
| 5. Certified practical record   | 03 |
| 6. Album  | 02 |
| 7. Viva voce  | 02 |



1. Construct inverting amplifier using OPAMP 741 and find its gain using DC and AC
2. Design a non-inverting amplifier using IC 741 and find gain for DC and AC
3. Construct a summing amplifier
4. Design and construct a comparator using IC 741
5. Construct a Astable multivibrator using 741 IC
6. Design a monostable multivibrator using 741 IC
7. Construct an integrator and study its output for Sine and triangular wave inputs
8. Construct a diffrentiator circuit using IC 741 and find its response to sine and triangular waves
9. Design AMV circuit using 555timer IC and find its duty cycle
10. Design and construct mmv using 555 and find duty cycle
11. Construct amplitude moderator and detector and find its modulator index
12. Construct frequency modulator and demodulator circuits and trace their wave forms
13. Simulate integrator circuit and study its response by changing the frequency of input
14. Simulate integrator circuit and study its response by changing the frequencies of input.
15. Simulate Wein bridge oscilloter using 741 IC and find its frequencyof Oscillations
16. Simulate Amv using 741 and find its duty cycle
17. Simulate Amv using timer IC



**FACULTY OF SCIENCE**  
**B.Sc. IV Semester (Practical) Examination-2018**  
**Subject: MICROBIOLOGY**

**QUESTION BANK**

**Time: 2 hours**

**Max. Marks:25**

**I. Experiment Questions**

**(12 Marks)**

1. Find out the quantity of Protein present in the given sample by Biuret/Lowry's method and plot a standard graph of protein by calorimetry (The examiner will provide unknown sample and necessary reagents).
2. Find out the amount of DNA present in the given sample by Diphenyl amine method and plot a standard graph of DNA by calorimetry (The examiner will provide unknown sample and necessary reagents).
3. Plot a standard graph of RNA by calorimetry using Orcinol method and find out the quantity of RNA present in the given sample (The examiner will provide unknown sample and necessary reagents).
4. Isolate genomic DNA from the given sample. Observe and report the result.
5. A sample is provided to you. Demonstrate electrophoretic separation by using Agarose gel electrophoresis and interpret your result.
6. Problems related to DNA, RNA characteristics, Transcription and Translation (The examiners can prepare problems to be solved by the students).


**II. Spottings**

**(4x2=8 Marks)**

7. Calorimeter
8. Cuvette
9. Micropipette
10. Centrifuge
11. PCR kit
12. Gel electrophoresis unit
13. DNS reagent with label
14. TE buffer
15. Diagrammatical representation of Lac operon
16. Biuret reagent with label
17. Orcinol reagent with label
18. Graph showing the estimation of DNA with label
19. Graph showing the estimation of RNA with label
20. Graph showing the estimation of Protein with label

**III. Record & viva**

**(5 Marks)**



**DSC – 1 D****Paper-BS404 (Practicals): BIOCHEMICAL PREPARATIONS AND SEPARATIONS  
(1 Credits; 2 Hr/week)  
QUESTION BANK****Duration 2 hours****Max. Marks 25****1. Write the Principles for the following experiments****5 Marks**

- A. Absorption maxima of Coloured substances
- B. Absorption spectra of Proteins
- C. Absorption spectra of DNA
- D. Isolation of Casein from milk
- E. Isolation of cholesterol
- F. Paper Chromatography
- G. Thin Layer Chromatography

**2. Major Experiment****10 Marks**

- A. Absorption maxima of coloured substances
- B. Absorption spectra of proteins
- C. Absorption spectra of Nucleic acids
- D. Separation of Amino acids by Paper chromatography
- E. Separation of plant pigments by TLC

**3. Minor Experiment****5 Marks**

- A. Isolation of Egg albumin from egg white
- B. Isolation of Casein from Milk
- C. Isolation of starch from potato
- D. Isolation of cholesterol from egg yolk

**4. Viva-Voce and Record****5 Marks**

**END SEMESTER FIANL PRACTICAL MODEL PAPER**

**SEMESTER IV**


**APPLIED NUTRITION & PUBLIC HEALTH**

**PAPER: FAMILY & COMMUNITY NUTRITION**

**TIME: 2HRS**

**MAX MARKS: 25**

1. Write the RDA (3MARKS)
2. Plan a day's diet for the given age group (5MARKS)
  - a. Adulthood
  - b. Pregnant women
  - c. Lactating mother
  - d. School going child
  - e. Adolescent
  - f. Old age group
3. Calculate the Nutritive value for **any two** Nutrients of importance(6MARKS)
4. Preparation & display of the diet (8MARKS)
5. Record (3MARKS)


  
Chairman  
Board of Studies in Nutrition  
Osmania University,  
Hyderabad-500 007.

**END SEMESTER PRACTICAL EXAMINATION  
SEMESTER 4  
CLINICAL NUTRITION AND DIETETICS  
PAPER – FOOD SCIENCE**

**Time: 2 Hrs**

**Max Marks: 25**

1. Write the recipe for 2 portions of any **one** of the following recipes and incorporate in a Menu **(10 Marks)**
  - a. Chinese Fried Rice
  - b. Lemon Rice
  - c. Masala Rajma
  - d. Chole
  - e. Vegetable soft noodles
  - f. Palak Paneer
  - g. Tomato soup
  - h. Chutney sandwich
  - i. Carrot Halwa
  - j. Vermicelli Kheer
2. Preparation and display of any **one** of the above mentioned recipes **(10 Marks)**
3. Napkin Fold **( 2 Marks)**
4. Practical Record **(3 Marks)**

  
Chairman  
Board of Studies in Nutrition  
Osmania University,  
Hyderabad-500 007.

**B.Sc Genetics II YEAR****IV- SEMESTER****MICROBIAL GENETICS AND GENETIC ENGINEERING (BS406)****QUESTION BANK FOR PRACTICALS****Duration= 2 hours****Total= 25M****I. MAJOR PRACTICALS****1x10=10M**

1. Gram staining
2. Bacterial growth curve
3. Isolation of bacteria
4. Induction and isolation of mutants in bacteria
5. Preparation of competent cells of bacteria
6. Amplification of gene of interest by PCR
7. Restriction digestion analysis

**II. MINOR PRACTICALS****1x5 = 5M**

1. Sterilization methods
2. Media composition and preparation
3. Purification and maintenance of bacterial cultures
4. Problems on Restriction mapping

**III. SPOTTERS / EXHIBITS****5x1 = 5M**

1. Display of bacterial media
2. Display of any sterilization equipments
3. Images of transformation, Conjugation, Interrupted mating, Transduction
4. Images of Vectors: PBR 322, PUC, Cosmid, Yeast vectors
5. Images of Blotting Techniques
6. Antibiotic resistance, Blue white colony screening methods
7. Images of Humulin, Bt Cotton, Golden rice, Phytoremediation, Bioremediation
8. Display of Industrial products- Cheese /Yoghurt

**IV. RECORD & VIVA****5M***H. S. K. Ravi*

### 2.8.1 Practicals Question Bank

#### Algebra

##### Unit-I

1. Show that  $\{1, 2, 3\}$  under multiplication modulo 4 is not a group but that  $\{1, 2, 3, 4\}$  under multiplication modulo 5 is a group.
2. Let  $G$  be a group with the property that for any  $x, y, z$  in the group,  $xy = zx$  implies  $y = z$ . Prove that  $G$  is Abelian.
3. Prove that the set of all  $3 \times 3$  matrices with real entries of the form

$$\begin{pmatrix} 1 & a & b \\ 0 & 1 & c \\ 0 & 0 & 1 \end{pmatrix}$$

is a group under multiplication.

4. Let  $G$  be the group of polynomials under addition with coefficients from  $Z_{10}$ . Find the orders of  $f(x) = 7x^2 + 5x + 4$ ,  $g(x) = 4x^2 + 8x + 6$ , and  $f(x) + g(x)$
5. If  $a$  is an element of a group  $G$  and  $|a| = 7$ , show that  $a$  is the cube of some element of  $G$ .
6. Suppose that  $\langle a \rangle$ ,  $\langle b \rangle$  and  $\langle c \rangle$  are cyclic groups of orders 6, 8, and 20, respectively. Find all generators of  $\langle a \rangle$ ,  $\langle b \rangle$ , and  $\langle c \rangle$ .
7. How many subgroups does  $Z_{20}$  have? List a generator for each of these subgroups.
8. Consider the set  $\{4, 8, 12, 16\}$ . Show that this set is a group under multiplication modulo 20 by constructing its Cayley table. What is the identity element? Is the group cyclic? If so, find all of its generators.
9. Prove that a group of order 4 cannot have a subgroup of order 3.
10. Determine whether the following permutations are even or odd.
  - a. (135)
  - b. (1356)
  - c. (13567)
  - d. (12)(134)(152)
  - e. (1243)(3521).

##### Unit-II

11. Show that the mapping  $a \longrightarrow \log_{10} a$  is an isomorphism from  $R^+$  under multiplication to  $R$  under addition.
12. Show that the mapping  $f(a + bi) = a - bi$  is an automorphism of the group of complex numbers under addition.
13. Find all of the left cosets of  $\{1, 11\}$  in  $U(30)$ .

14. Let  $C^*$  be the group of nonzero complex numbers under multiplication and let  $H = \{a + bi \in C^* / a^2 + b^2 = 1\}$ . Give a geometric description of the coset  $(3 + 4i)H$ . Give a geometric description of the coset  $(c + di)H$ .
15. Let  $H = \left\{ \begin{pmatrix} a & b \\ 0 & d \end{pmatrix} / a, b, d \in R, ad \neq 0 \right\}$ . Is  $H$  a normal subgroup of  $GL(2, R)$ ?
16. What is the order of the factor group  $\frac{Z_{60}}{\langle 5 \rangle}$ ?
17. Let  $G = U(16)$ ,  $H = \{1, 15\}$ , and  $K = \{1, 9\}$ . Are  $H$  and  $K$  isomorphic? Are  $G/H$  and  $G/K$  isomorphic?
18. Prove that the mapping from  $R$  under addition to  $GL(2, R)$  that takes  $x$  to

$$\begin{bmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{bmatrix}$$

is a group homomorphism. What is the kernel of the homomorphism?

19. Suppose that  $f$  is a homomorphism from  $Z_{30}$  to  $Z_{30}$  and  $\text{Ker } f = \{0, 10, 20\}$ . If  $f(23) = 9$ , determine all elements that map to 9.
20. How many Abelian groups (up to isomorphism) are there
  - a. of order 6?
  - b. of order 15?
  - c. of order 42?
  - d. of order  $pq$ , where  $p$  and  $q$  are distinct primes?
  - e. of order  $pqr$ , where  $p, q$ , and  $r$  are distinct primes?

### Unit-III

21. Let  $M_2(Z)$  be the ring of all  $2 \times 2$  matrices over the integers and let  $R = \left\{ \begin{pmatrix} a & a \\ b & b \end{pmatrix} / a, b \in Z \right\}$ . Prove or disprove that  $R$  is a subring of  $M_2(Z)$ .
22. Suppose that  $a$  and  $b$  belong to a commutative ring  $R$  with unity. If  $a$  is a unit of  $R$  and  $b^2 = 0$ , show that  $a + b$  is a unit of  $R$ .
23. Let  $n$  be an integer greater than 1. In a ring in which  $x^n = x$  for all  $x$ , show that  $ab = 0$  implies  $ba = 0$ .
24. List all zero-divisors in  $Z_{20}$ . Can you see a relationship between the zero-divisors of  $Z_{20}$  and the units of  $Z_{20}$ ?
25. Let  $a$  belong to a ring  $R$  with unity and suppose that  $a^n = 0$  for some positive integer  $n$ . (Such an element is called nilpotent.) Prove that  $1 - a$  has a multiplicative inverse in  $R$ .
26. Let  $d$  be an integer. Prove that  $Z[\sqrt{d}] = \{a + b\sqrt{d} / a, b \in Z\}$  is an integral domain.
27. Show that  $Z_n$  has a nonzero nilpotent element if and only if  $n$  is divisible by the square of some prime.

28. Find all units, zero-divisors, idempotents, and nilpotent elements in  $Z_3 \oplus Z_6$ .
29. Find all maximal ideals in
- $Z_8$ .
  - $Z_{10}$ .
  - $Z_{12}$ .
  - $Z_n$ .
30. Show that  $R[x]/\langle x^2 + 1 \rangle$  is a field.

#### Unit-IV

31. Prove that every ring homomorphism  $f$  from  $Z_n$  to itself has the form  $f(x) = ax$ , where  $a^2 = a$ .
32. Prove that a ring homomorphism carries an idempotent to an idempotent.
33. In  $Z$ , let  $A = \langle 2 \rangle$  and  $B = \langle 8 \rangle$ . Show that the group  $A/B$  is isomorphic to the group  $Z_4$  but that the ring  $A/B$  is not ring-isomorphic to the ring  $Z_4$ .
34. Show that the number 9,897,654,527,609,805 is divisible by 99.
35. Show that no integer of the form 111,111,111,...,111 is prime.
36. Let  $f(x) = 4x^3 + 2x^2 + x + 3$  and  $g(x) = 3x^4 + 3x^3 + 3x^2 + x + 4$ , where  $f(x), g(x) \in Z_5[x]$ . Compute  $f(x) + g(x)$  and  $f(x).g(x)$ .
37. Let  $f(x) = 5x^4 + 3x^3 + 1$  and  $g(x) = 3x^2 + 2x + 1$  in  $Z_7[x]$ . Determine the quotient and remainder upon dividing  $f(x)$  by  $g(x)$ .
38. Let  $f(x)$  belong to  $Z_p[x]$ . Prove that if  $f(b) = 0$ , then  $f(b^p) = 0$ .
39. Is the mapping from  $Z_{10}$  to  $Z_{10}$  given by  $x \rightarrow 2x$  a ring homomorphism?
40. Determine all ring homomorphisms from  $Z$  to  $Z$ .
- \_\_\_\_\_



**Computer Networks Lab****BA406****Practical**

2 Hours/Week

1 credit

- 1 Use vi editor to create different files, writing data into files, modifying data in files.
- 2 Use different types of Unix commands on the files created in first program.
- 3 Write shell programs using 'case', 'then' and 'if' & 'else' statements.
- 4 Write shell programs using while, do-while and for loop statements.
- 5 Write a shell script that accepts two integers as its arguments and computes the value of first number raised to the power of the second number.
- 6 Write a shell script that takes a command-line argument and reports on whether it is directory, a file, or something else.
- 7 Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
- 8 Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
- 9 Write a program to create a socket and implement connect function.
- 10 Write a program to display hello world using signals.
- 11 Write a program to implement the sliding window protocol.
- 12 Write a program to implement listener and talker.
- 13 Write a program to implement TCP echo using client-server program
- 14 Write a program to implement UDP echo using client-server program.
- 15 Write a TCP client-server program to convert a given string into reverse.
- 16 Write a UDP client-server program to convert a given string into reverse.

**Note :** Recommended to use Open Source Software like Fedora, Ubuntu, CentOS, etc...  
Write above program using C language on Unix/Linux Systems.

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**Note :** Recommended to use Open Source Software like Fedora, Ubuntu, CentOS, etc...  
Write above program using C language on Unix/Linux Systems.

**Database Management Systems Lab****BS406****Practical**

2 Hours/Week

1 credit

Consider the relational schema for part of the **DreamHome** case study is:

**Branch** (branchNo, street, city, postcode)

**Staff** (staffNo, fName, IName, position, sex, DOB, salary, branchNo)

**PropertyForRent** (propertyNo, street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)

**Client** (clientNo, fName, IName, telNo, prefType, maxRent, eMail)

**PrivateOwner** (ownerNo, fName, IName, address, telNo, eMail, password)

**Viewing** (clientNo, propertyNo, viewDate, comment)

**Registration** (clientNo, branchNo, staffNo, dateJoined)

1. Create a database with name "DreamHome" and now create all the tables listed above with constraints.
2. Insert a new row into the table supplying data for all columns.
3. Modify data in the database using UPDATE
4. Delete data from the database using DELETE
5. Changing a table definition using ALTER
6. Removing a table using DROP
7. Removing rows in table using TRUNCATE
8. Create an index and removing an index
9. Practice other standard SQL commands for creating, modifying, displaying data of tables.
10. List full details of all staff.
11. List all staff with a salary greater than £10000.
12. List the property numbers of all properties that have been viewed.
13. Produce a list of salaries for all staff, showing only the staffNo, fName, IName, and salary details.
14. List all cities where there is either a branch office or a property for rent.
15. List all cities where there is a branch office but no properties for rent.
16. List all cities where there is both a branch office and at least one property for rent.
17. List the names and comments of all clients who have viewed a property for rent.
18. Produce a status report on property viewings.
19. List complete details of all staff who work at the branch in Glasgow.
20. List the addresses of all branch offices in London or Glasgow
21. List all staff with a salary between £20,000 and £30,000.
22. Identify all clients who have viewed all properties with three rooms.
23. How many properties cost more than £350 per month to rent?
24. How many different properties were viewed in May 2013?
25. Find the total number of Managers and the sum of their salaries.
26. Find the minimum, maximum, and average staff salary.
27. Find the number of staff working in each branch and the sum of their salaries.
28. List all managers and supervisors.
29. Find all owners with the string 'Glasgow' in their address.
30. List the details of all viewings on property PG4 where a comment has not been supplied.
31. Produce a list of salaries for all staff, arranged in descending order of salary.
32. Produce an abbreviated list of properties arranged in order of property type.
33. Find the number of staff working in each branch and the sum of their salaries.
34. For each branch office with more than one member of staff, find the number of staff working in each branch and the sum of their salaries.
35. List the staff who work in the branch at '163 Main St'.
36. List all staff whose salary is greater than the average salary, and show by how much their salary is greater than the average.
37. List the properties that are handled by staff who work in the branch at '163 Main St'.
38. Find all staff whose salary is larger than the salary of at least one member of staff at branch B003.
39. Find all staff whose salary is larger than the salary of every member of staff at branch B003
40. List the names of all clients who have viewed a property, along with any comments supplied.
41. For each branch office, list the staff numbers and names of staff who manage properties and the properties that they manage.
42. For each branch, list the staff numbers and names of staff who manage properties, including the city in which the branch is located and the properties that the staff manage.

43. Find the number of properties handled by each staff member, along with the branch number of the member of staff.
44. List all branch offices and any properties that are in the same city.
45. List all properties and any branch offices that are in the same city.
46. List the branch offices and properties that are in the same city along with any unmatched branches or properties.
47. Find all staff who work in a London branch office.
48. Construct a list of all cities where there is either a branch office or a property.
49. Construct a list of all cities where there is both a branch office and a property.
50. Create a view so that the manager at branch B003 can see the details only for staff who work in his or her branch office.
51. Create a view of the staff details at branch B003 that excludes salary information, so that only managers can access the salary details for staff who work at their branch.
52. Create a view of staff who manage properties for rent, which includes the branch number they work at, their staff number, and the number of properties they manage.
53. Removing a view using DROP VIEW
54. Give the user with authorization identifier Manager all privileges on the Staff table.
55. Give users Personnel and Director the privileges SELECT and UPDATE on column salary of the Staff table.
56. Revoke the privilege SELECT on the Branch table from all users.
57. Revoke all privileges you have given to Director on the Staff table.
58. Demonstrate exceptions in PL/SQL
59. Demonstrate cursors in PL/SQL
60. Write PL/SQL queries to create procedures.
61. Write PL/SQL queries to create functions.
62. Write PL/SQL queries to create package.
63. Write PL/SQL queries to create triggers.
64. Write PL/SQL queries using recursion.

Consider the relational schema for part of the **Hotel** case study is:

**Hotel** (hotelNo, hotelName, city)

**Room** (roomNo, hotelNo, type, price)

**Booking** (hotelNo, guestNo, dateFrom, dateTo, roomNo)

**Guest** (guestNo, guestName, guestAddress)

65. Create a database with name "Hotel" and now create all the tables listed above with constraints.
66. Insert a new row into the table supplying data for all columns.
67. Modify data in the database using UPDATE
68. Delete data from the database using DELETE
69. Changing a table definition using ALTER
70. Removing a table using DROP
71. Removing rows in table using TRUNCATE
72. Practice other standard SQL commands for creating, modifying, displaying data of tables.
73. List full details of all hotels.
74. List full details of all hotels in London.
75. List the names and addresses of all guests living in London, alphabetically ordered by name.
76. List all double or family rooms with a price below £40.00 per night, in ascending order of price.
77. List the bookings for which no dateTo has been specified.
78. How many hotels are there?
79. What is the average price of a room?
80. What is the total revenue per night from all double rooms?
81. How many different guests have made bookings for August?
82. List the price and type of all rooms at the Grosvenor Hotel.
83. List all guests currently staying at the Grosvenor Hotel.
84. List the details of all rooms at the Grosvenor Hotel, including the name of the guest staying in the room.
85. What is the total income from bookings for the Grosvenor Hotel today?
86. List the rooms that are currently unoccupied at the Grosvenor Hotel.
87. What is the lost income from unoccupied rooms at the Grosvenor Hotel?
88. List the number of rooms in each hotel.
89. List the number of rooms in each hotel in London.
90. What is the average number of bookings for each hotel in August?
91. What is the most commonly booked room type for each hotel in London?
92. What is the lost income from unoccupied rooms at each hotel today?
93. Insert rows into each of these tables.

94. Update the price of all rooms by 5%.
95. Demonstrate that queries written using the UNION operator and same can be rewritten using the OR.
96. Apply the syntax for inserting data into a table.
97. Create a view containing the cheapest hotels in the world.
98. Create the Hotel table using the integrity enhancement features of SQL.
99. Create a database trigger for the following situations:
  - (a) The price of all double rooms must be greater than £100.
  - (b) The price of double rooms must be greater than the price of the highest single room.
  - (c) A booking cannot be for a hotel room that is already booked for any of the specified dates.
  - (d) A guest cannot make two bookings with overlapping dates.
  - (e) Maintain an audit table with the names and addresses of all guests who make bookings for hotels in London (do not store duplicate guest details).

Given relation schemas are

**Sailors**(sid : integer, sname : string, rating : integer, age : real)

**Boats**(bid : integer, bname : string, color : string)

**Reserves**(sid : integer, bid : integer, day : date)

100. Find the names and ages of all sailors.
101. Find all sailors with a rating above 7.
102. Find the names of sailors who have reserved boat 103.
103. Find the sids of sailors who have reserved a red boat.
104. Find the names of sailors who have reserved a red boat.
105. Find the colors of boats reserved by Lubber.
106. Find the names of sailors who have reserved at least one boat.
107. Find the names of sailors who have reserved at least two boats.
108. Compute increments for the ratings of persons who have sailed two different boats on the same day.
109. Find the ages of sailors whose name begins and ends with B and has at least three characters.
110. Find the names of sailors who have reserved a red or a green boat.
111. Find the names of sailors who have reserved a red and a green boat.
112. Find the sids of all sailors who have reserved red boats but not green boats.
113. Find all sids of sailors who have a rating of 10 or have reserved boat 104.
114. Find the names of sailors who have not reserved a red boat.
115. Find sailors whose rating is better than some sailor called Horatio.
116. Find sailors whose rating is better than every sailor called Horatio.
117. Find the names of sailors who have reserved all boats.
118. Find the names of sailors who have reserved at least two boats.
119. Find the names of sailors who have reserved all boats called Interlake.
120. Find sailors who have reserved all red boats.
121. Find the sailor name, boat id, and reservation date for each reservation.
122. Find the sids of sailors with age over 20 who have not reserved a red boat.
123. Find the average age of all sailors.
124. Find the average age of sailors with a rating of 10.
125. Find the name and age of the oldest sailor.
126. Count the number of different sailor names.
127. Find the names of sailors who are older than the oldest sailor with a rating of 10.
128. Find the sailors with the highest rating.
129. Find the age of the youngest sailor for each rating level.
130. Find age of the youngest sailor who is eligible to vote for each rating level with at least 2 such sailors.
131. Find the average age of sailors for each rating level that has at least two sailors.
132. For each red boat, find the number of reservations for this boat.
133. Find the average age of sailors who are of voting age (i.e., at least 18 years old) for each rating level that has at least two sailors.
134. Delete the records of sailors who have rating 8 (deleting some rows in a table).
135. Loading data which is present in the text into the table.

**Note** Recommended to use open source database software like MySQL, MongoDB, PostgreSQL, etc...

: In practical examination, students have to

- Create database
- Create tables with their integrity constraints.
- Insert the data into tables and then execute the queries.
- Answer any **six** queries from **ten** queries given by the examiner.