Reg. No. | | | | | | | | | |

BSCZOEN 201

II Semester Open Elective (NEP – 2020) Examination, September 2022
ZOOLOGY – Parasitology
(2021 – 22 Batch Onwards)

Time : 2 Hours

Max. Marks : 60

PART – A
ಭಾಗ - ಎ

I. Answer **any six** questions out of nine questions. **(6×2=12)**
ಒಂಬತ್ತು ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಯಾವುದಾದರೂ **ಆರು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.

a) What are parasites ? Give an example.
ಪರಾವಲಂಬಿಗಳು ಯಾವುವು ? ಒಂದು ಉದಾಹರಣೆ ಕೊಡಿ.

b) Name two Parasitic Platyhelminthes and the disease caused by them.
ಎರಡು ಪರಾವಲಂಬಿ ಚಪ್ಪಟೆಹುಳ ಮತ್ತು ಅವುಗಳಿಂದ ಉಂಟಾಗುವ ರೋಗವನ್ನು ಹೆಸರಿಸಿ.

c) Name the two morphological forms of *Giardia intestinalis*.
ಗಿಯಾರ್ಡಿಯಾ ಇಂಟೆಸ್ಟಿನಾಲಿಸ್‌ನ ಎರಡು ರೂಪಗಳನ್ನು ಹೆಸರಿಸಿ.

d) Name the hosts of filarial worm.
ಫೈಲೇರಿಯಲ್ ಹುಳದ ಆತಿಥೇಯ ಜೀವಿಯನ್ನು ಹೆಸರಿಸಿ.

e) Which is the parasitic behaviour of lice ?
ಹೇನುಗಳ ಪರಾವಲಂಬಿ ವರ್ತನೆಗಳು ಯಾವುವು ?

f) What is the effect of Vampire Bat on host ?
ಆತಿಥೇಯಗಳ ಮೇಲೆ ವ್ಯಾಂಪೈರ್ ಬಾವಲಿಯಿಂದ ಆಗುವ ಪರಿಣಾಮಗಳು ಏನು ?

g) Expand ELISA.
ELISA ಇದನ್ನು ವಿಸ್ತರಿಸಿ.

h) Write any two advantages of molecular diagnosis.
ಆಣ್ವಿಕ ರೋಗನಿರ್ಣಯದಿಂದಾಗುವ ಯಾವುದಾದರೂ ಎರಡು ಪ್ರಯೋಜನಗಳನ್ನು ಬರೆಯಿರಿ.

i) Name a serological technique used for diagnosis of endoparasites.
ಎಂಡೋಪರಾಸೈಟ್ಗಳ ರೋಗನಿರ್ಣಯಕ್ಕೆ ಬಳಸಲಾಗುವ ಸೆರೋಲಾಜಿಕಲ್ ತಂತ್ರವನ್ನು ಹೆಸರಿಸಿ.

P.T.O.

PART – B

ಭಾಗ - ಬಿ

Unit – I

ಘಟಕ - I

(3×3=9)

II. Answer **any three** out of four.
ನಾಲ್ಕರಲ್ಲಿ ಯಾವುದಾದರೂ **ಮೂರಕ್ಕೆ** ಉತ್ತರಿಸಿ.

a) Define mutualism. Explain any one example.
ಪರಸ್ಪರವಾದವನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ. ಯಾವುದಾದರೂ ಒಂದು ಉದಾಹರಣೆಯನ್ನು ವಿವರಿಸಿ.

b) Draw a neat labeled diagram of tapeworm.
ಟೇಪ್ವರ್ಮ್‌ನ ಸುಂದರವಾದ ರೇಖಾಚಿತ್ರವನ್ನು ಬರೆದು ಅದರ ಭಾಗಗಳನ್ನು ಹೆಸರಿಸಿ.

c) Write a short note on life cycle of *Fasciolapsis buski.*
ಫ್ಯಾಸಿಯೋಲ್ಯಾಪ್ಸಿಸ್‌ಬಸ್ಕಿ ಜೀವನಚಕ್ರದ ಬಗ್ಗೆ ಒಂದು ಸಣ್ಣ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

d) Explain the prophylaxis and control of *Entamoeba histolytica.*
ಎಂಟಮೀಬಾ ಹಿಸ್ಟೋಲಿಟಿಕಾದ ರೋಗನಿರೋಧಕ ಕ್ರಮ ಮತ್ತು ನಿಯಂತ್ರಣವನ್ನು ವಿವರಿಸಿ.

(7×1=7)

III. Answer **any one** out of two.
ಎರಡರಲ್ಲಿ ಯಾವುದಾದರೂ ಒಂದಕ್ಕೆ ಉತ್ತರಿಸಿ.

a) Explain the host-parasite adaptations.
ಆತಿಥೇಯ–ಪರಾವಲಂಬಿ ರೂಪಾಂತರಗಳನ್ನು ವಿವರಿಸಿ.

b) Explain the life cycle of Taenia solium.
ಟೇನಿಯಾ ಸೋಲಿಯಂನ ಜೀವನ ಚಕ್ರವನ್ನು ವಿವರಿಸಿ.

Unit – II

ಘಟಕ - II

(3×3=9)

IV. Answer **any three** out of four.
ನಾಲ್ಕರಲ್ಲಿ ಯಾವುದಾದರೂ **ಮೂರಕ್ಕೆ** ಉತ್ತರಿಸಿ.

a) Explain the morphology of Ascaris lumbricoides.
ಆಸ್ಕಾರಿಸ್‌ಲುಂಬ್ರಿಕಾಯ್ಡ್ ರೂಪ ವಿಜ್ಞಾನವನ್ನು ವಿವರಿಸಿ.

b) Explain the biology and importance of ticks.
ಉಣ್ಣೆಗಳ ಜೀವನ ಮತ್ತು ಪ್ರಾಮುಖ್ಯತೆಯನ್ನು ವಿವರಿಸಿ.

c) Write short note on the parasitoids.
ಪರಾವಲಂಬಿಗಳ ಮೇಲೆ ಕಿರುಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

d) Describe the parasitic behaviour of cooki cutter shark.
ಕೂಕಿ ಕಟ್ಟರ್ ಶಾರ್ಕ್‌ನ ಪರಾವಲಂಬಿ ವರ್ತನೆಯನ್ನು ವಿವರಿಸಿ.

V. Answer **any one** out of two : **(7×1=7)**
ಎರಡರಲ್ಲಿ ಯಾವುದಾದರೂ ಒಂದಕ್ಕೆ ಉತ್ತರಿಸಿ.

a) Explain the life cycle of Wuchereria bancrofti.
ವುಚೆರೇರಿಯಾ ಬ್ಯಾಂಕ್ರೋಫ್ಟಿಯ ಜೀವನಚಕ್ರವನ್ನು ವಿವರಿಸಿ.

b) Explain the Nematode-plant interaction with relevant example.
ನೆಮಟೋಡ್–ಸಸ್ಯ ಪರಸ್ಪರ ಕ್ರಿಯೆಯನ್ನು ಸಂಬಂಧಿತ ಉದಾಹರಣೆಯೊಂದಿಗೆ ವಿವರಿಸಿ.

Unit – III
ಘಟಕ - III

VI. Answer **any three** out of four. **(3×3=9)**
ನಾಲ್ಕರಲ್ಲಿ ಯಾವುದಾದರೂ **ಮೂರಕ್ಕೆ** ಉತ್ತರಿಸಿ.

a) Explain PCR.
PCR ಅನ್ನು ವಿವರಿಸಿ.

b) Write short note on DNA probe.
DNA probe ಗಳ ಕುರಿತು ಕಿರುಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

c) Briefly explain the concept of molecular diagnosis for parasitic infections.
ಪರಾವಲಂಬಿ ಸೋಂಕುಗಳಿಗೆ ಆಣ್ವಿಕ ರೋಗನಿರ್ಣಯದ ಪರಿಕಲ್ಪನೆಯನ್ನು ಸಂಕ್ಷಿಪ್ತವಾಗಿ ವಿವರಿಸಿ.

d) What are the advantages and disadvantages of molecular diagnosis ?
ಆಣ್ವಿಕ ರೋಗನಿರ್ಣಯದ ಅನುಕೂಲಗಳು ಮತ್ತು ಅನಾನುಕೂಲಗಳು ಯಾವುವು ?

VII. Answer **any one** out of two. **(7×1=7)**
ಎರಡರಲ್ಲಿ ಯಾವುದಾದರೂ ಒಂದಕ್ಕೆ ಉತ್ತರಿಸಿ.

a) Derscribe the immunoassay used for laboratory diagnosis of *Giardia intestinalis*.
ಗಿಯಾರ್ಡಿಯಾ ಇಂಟೆಸ್ಟಿನಾಲಿಸ್ನ ಪ್ರಯೋಗಾಲಯ ರೋಗನಿರ್ಣಯಕ್ಕೆ ಬಳಸಲಾಗುವ ಇಮ್ಯುನೋಅಸ್ಸೇ ಅನ್ನು ವಿವರಿಸಿ.

b) Explain fundamental techniques used in molecular diagnosis of endoparasites.
ಎಂಡೋಪರಾಸೈಟ್ಗಳ ಆಣ್ವಿಕ ರೋಗನಿರ್ಣಯದಲ್ಲಿ ಬಳಸಲಾಗುವ ಮೂಲಭೂತ ತಂತ್ರಗಳನ್ನು ವಿವರಿಸಿ.

Reg. No. | | | | | | | | | |

BCACAEN 201

Second Semester Open Elective (NEP-2020) Examination, September 2022 (2021-22 Batch Onwards) WEB DESIGNING

Time : 2 Hours

Max. Marks : 60

***Note** : Answer **any six** questions from Part – **A** and **one full** question from each Unit in Part – **B**.*

PART – A

(6×2=12)

1. a) Differentiate web server and web browser.
   b) What is EDI and EFT ?
   c) Write the basic structure of an HTML document.
   d) Differentiate <BR> and <P>.
   e) What is the difference between TEXTAREA and TEXT BOX element ?
   f) What is the use of password in INPUT Type ?
   g) What is CSS ? Why is it used ?
   h) Write any two features of XML.

PART – B

Unit – I

2. a) Explain the typical structure of URL.
   b) Write a note on IRC.
   c) Explain the working of a search engines. **(4+4+4)**

3. a) What are the advantages of sending Email ?
   b) Explain the various types of internet connections available.
   c) Explain the elements required for video conference. **(3+6+3)**

P.T.O.

Unit – II

4. a) What are the data types available in HTML ? Explain.
   b) How lists are displayed in HTML ? Explain.
   c) Explain the various elements used to format the text in HTML. **(4+4+4)**

5. a) Explain the use of TITLE and BASE element.
   b) Write a note on Header and Footer.
   c) Explain DIV and SPAN elements. Give example. **(4+4+4)**

Unit – III

6. a) How do we create hyperlinks in HTML ? Explain with example.
   b) Explain the following table elements.
      i) CAPTION
      ii) TH
      iii) TD.
   c) How to insert an image in a web page? Explain. **(4+4+4)**

7. a) Write a note on exploring colours in HTML.
   b) Explain the elements used for creating multiple choice elements in web form. **(6+6)**

Unit – IV

8. a) List the three ways to apply CSS Styles and HTML documents, explain any one.
   b) Explain internal style sheet.
   c) Write any four rules used for defining an XML elements. **(4+4+4)**

9. a) Write two advantages and disadvantages of XML.
   b) Write the structure of XML document. Explain.
   c) Explain the different background properties in CSS. **(4+4+4)**

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BSCCSEN 201

II Semester Open Elective (NEP – 2020) Examination, September 2022
COMPUTER SCIENCE
Web Designing
(2021 – 22 Batch Onwards)

Time : 2 Hours

Max. Marks : 60

Note : *Answer* ***any six*** *questions from Part –* ***A*** *and* ***one full*** *question from* ***each*** *Unit of Part –* ***B****.*

PART – A

1. Answer **any six** of the following questions. **(6×2=12)**
   a) What is a browser ? Give an example.
   b) Expand (i) URL (ii) WWW.
   c) Mention any 2 editors which support HTML5.
   d) What is HTML ?
   e) What are hyperlink in HTML ? Give an example.
   f) What is the difference between link and hyperlink ? Give an example.
   g) Expand CSS. Why CSS is used in web pages ?
   h) Expand XML. Mention any 2 important features of XML.

PART – B

Answer **one full** question from **each** Unit.

Unit – I

2. a) Explain any 3 internet terms. 6
   b) Explain how E-mail works. 6
3. a) Mention advantages and disadvantages of E-mail. 6
   b) Explain any 3 internet applications. 6

P.T.O.

Unit – II

4. a) Explain the steps to create, save and viewing the HTML document. 6

   b) Explain the following HTML Sections elements with example. 6

      i) BODY ii) SECTION iii) NAV

5. a) Explain the basic structure of HTML document. 6

   b) Explain how to format text in tables in HTML5 with an example. 6

Unit – III

6. a) What is encoding of URL ? Explain. 6

   b) Explain how to insert images in a web page. Mention different ways of coloring web page, explain any one. 6

7. a) What is INPUT element in FORM element ? Mention its different types and explain any one. 6

   b) Explain any two TABLE elements with an example. 6

Unit – IV

8. a) What are CSS Selectors ? Mention its different types. Explain any two. 6

   b) List and explain the differences between XML and HTML. 6

9. a) Mention different ways of applying / inserting CSS style to HTML document. Explain any one with example. 6

   b) Describe the structure of an XML document with an example. 6

Reg. No. | | | | | | | | | |

BSCBOEN 201

Second Semester Open Elective (NEP 2020) Degree Examination, September 2022
(2021-2022 Batch Onwards)
BOTANY
Plant Propogation, Nursery Management and Gardening

Time : 2 Hours Max. Marks : 60

Instructions : *1) Answer **all** the questions.*
*2) Draw the diagrams **wherever** necessary.*

I. Answer **any ten** of the following : **(2×10=20)**

a) What is compost ?

b) Define seed viability.

c) Write the significance of seed testing.

d) Which season is best for collecting plant cuttings and why ?

e) List the uses of mist chamber.

f) Write the scopes of gardening.

g) Why computer application is important in landscaping ?

h) Define biocontrol.

i) What do you mean by seedlings ?

j) Name the tools used for bonsai technique.

k) Name types of planting.

l) What do you mean by soil free growth medium ?

II. Answer **any eight** of the following : **(5×8=40)**

1) Describe the characteristics of a potting media.

2) Write a note on seed testing.

P.T.O.

3) What is a seed ? Explain its types.

4) Define vegetative propogation. Name the different types.

5) Write the process of stem cutting.

6) Name the different types of gardens.

7) Explain the various steps in gardening operations.

8) Define gardening. Mention its objectives.

9) Discuss on the storage procedure of seedlings.

10) Enumerate the maintenance of lawns.

Reg. No. | | | | | | | | | |

BSCMBEN 201

Second Semester Open Elective (NEP 2020) Degree Examination, September 2022

(2021-22 Batch Onwards)

MICROBIOLOGY

ಮೈಕ್ರೋಬಯಾಲಾಜಿ

Environmental Microbiology and Human Health

ಪರಿಸರೀಯ ಸೂಕ್ಷ್ಮ ಜೀವವಿಜ್ಞಾನ ಮತ್ತು ಮಾನವ ಆರೋಗ್ಯ

Time : 2 Hours

Max. Marks : 60

Note : 1) *Answer Part – **A** , Part – **B** and Part – **C**.*

ಸೂಚನೆಗಳು : ಭಾಗ – ಎ, ಭಾಗ – ಬಿ ಮತ್ತು ಭಾಗ – ಸಿ ಯನ್ನು ಉತ್ತರಿಸಿ.

2) *Draw the diagram **wherever** necessary.*

ಅಗತ್ಯವಿರುವ ಕಡೆ ರೇಖಾಚಿತ್ರಗಳನ್ನು ಬರೆಯಿರಿ.

PART – A

ಭಾಗ – ಎ

I. Answer **any five** of the following : **(5×2=10)**

ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದಾದರೂ ಐದನ್ನು ಉತ್ತರಿಸಿ :

a) Microbes in soil and air.

ಮಣ್ಣು ಮತ್ತು ಗಾಳಿಯಲ್ಲಿ ಸೂಕ್ಷ್ಮ ಜೀವಿಗಳು.

b) Importance of water testing.

ನೀರಿನ ಪರೀಕ್ಷೆಯ ಪ್ರಾಮುಖ್ಯತೆ.

c) Harmful microbes.

ಹಾನಿಕಾರಕ ಸೂಕ್ಷ್ಮ ಜೀವಿಗಳು.

P.T.O.

d) Beneficial Microbes.

ಪ್ರಯೋಜನಕಾರಿ ಸೂಕ್ಷ್ಮಜೀವಿಗಳು.

e) Infection.

ಸೋಂಕು.

f) Symptoms.

ರೋಗ ಲಕ್ಷಣಗಳು.

g) Communicable diseases.

ಸಾಂಕ್ರಾಮಿಕ ರೋಗಗಳು.

h) Types of water tests.

ನೀರಿನ ಪರೀಕ್ಷೆಗಳ ವಿಧಗಳು.

PART – B

ಭಾಗ – ಬಿ

II. Answer **any four** questions from the following : **(5×4=20)**

ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ **ನಾಲ್ಕು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ :

1) Explain the properties of soil briefly.

ಮಣ್ಣಿನ ಗುಣಲಕ್ಷಣಗಳನ್ನು ಸಂಕ್ಷಿಪ್ತವಾಗಿ ವಿವರಿಸಿ.

2) What are the major types of beneficial and harmful microbes in soil ?

ಮಣ್ಣಿನಲ್ಲಿರುವ ಪ್ರಯೋಜನಕಾರಿ ಮತ್ತು ಹಾನಿಕಾರಕ ಸೂಕ್ಷ್ಮಜೀವಿಗಳ ಪ್ರಮುಖ ವಿಧಗಳು ಯಾವುವು ?

3) Explain why water is the major component of environment.

ನೀರು ಏಕೆ ಪರಿಸರದ ಪ್ರಮುಖ ಅಂಶವಾಗಿದೆ ಎಂಬುದನ್ನು ವಿವರಿಸಿ.

4) Write a note on the water testing in laboratory.

ಪ್ರಯೋಗಾಲಯದಲ್ಲಿ ನೀರಿನ ಪರೀಕ್ಷೆಯ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

5) What is public health ? Give two examples of bacterial diseases.

ಸಾರ್ವಜನಿಕ ಆರೋಗ್ಯ ಎಂದರೇನು ? ಬ್ಯಾಕ್ಟೀರಿಯಾ ಕಾಯಿಲೆಗಳ ಎರಡು ಉದಾಹರಣೆಗಳನ್ನು ನೀಡಿ.

6) Write a note on food borne diseases caused by microbes.

ಸೂಕ್ಷ್ಮ ಜೀವಿಗಳಿಂದ ಉಂಟಾಗುವ ಆಹಾರದಿಂದ ಹರಡುವ ರೋಗಗಳ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

PART – C

ಭಾಗ - ಸಿ

III. Answer **any three** of the following : **(10×3=30)**

ಕೆಳಗಿನವುಗಳಿಂದ ಯಾವುದೇ **ಮೂರು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ :

1) Give importance of microorganisms present in air.

ಗಾಳಿಯಲ್ಲಿ ಇರುವ ಸೂಕ್ಷ್ಮ ಜೀವಿಗಳ ಬಗ್ಗೆ ಪ್ರಾಮುಖ್ಯತೆಯನ್ನು ನೀಡಿ.

2) What is the significance of studying water microbiology ?

ನೀರಿನ ಸೂಕ್ಷ್ಮ ಜೀವ ವಿಜ್ಞಾನ ಅಧ್ಯಯನದ ಮಹತ್ವವೇನು ?

3) Define the terms. Give examples.

ಉದಾಹರಣೆಯೊಂದಿಗೆ ಪದಗಳನ್ನು ವಿವರಿಸಿ.

a) Diseases
ರೋಗಗಳು.

b) Lab. Diagnosis
ಪ್ರಯೋಗಾಲಯ ರೋಗನಿರ್ಣಯ.

c) Vaccine.
ಲಸಿಕೆ.

4) What are the communicable diseases ? Give its significance in public health ?

ಸಾಂಕ್ರಾಮಿಕ ರೋಗಗಳು ಯಾವುವು ? ಸಾರ್ವಜನಿಕ ಆರೋಗ್ಯದಲ್ಲಿ ಅದರ ಮಹತ್ವವನ್ನು ನೀಡಿ.

Reg. No. | | | | | | | | |

BSCCSC 152

Credit Based Second Semester B.Sc. Degree Examination, September 2022

(2018-19 and Earlier Batches)

COMPUTER SCIENCE

Paper – II : Programming in C

Time : 3 Hours Max. Marks : 80

PART – A

1. Answer **any ten** of the following : **(10×2=20)**

a) What is the difference between a variable and constant ?

b) What is the use of sizeof() operator ?

c) Write the syntax of else if ladder statement.

d) Name any four keywords in C.

e) Specify the process of executing a C program.

f) How do you define symbolic constants ?

g) How do you initialize array at run time ?

h) Differentiate between x++ and ++x with example.

i) How to declare and initialize a pointer variable ?

j) Differentiate between structure and union.

k) Define recursion.

l) How is a file declared ? How a file can be closed ?

P.T.O.

PART – B

Note : Answer **one full** question from **each** unit.

Unit – I

2. a) What are fundamental data types supported by C language ? Explain it.

   b) What are the different logical operators available in C ? Explain with syntax and example.

   c) Explain scanf() and printf() functions with syntax and example. **(5+5+5)**

3. a) Draw flowchart to find largest of three numbers.

   b) Explain different types of C tokens in C language.

   c) Explain various features of C language. **(5+5+5)**

Unit – II

4. a) Explain different types of decision making statements of C.

   b) Explain the use of break and continue statements with examples.

   c) Write a C program to read 'n' numbers and find whether an element exists or not ? If exists, print its position. **(5+5+5)**

5. a) What is meant by looping ? Explain any two looping statements with example.

   b) How do you declare and initialize one dimensional array ?

   c) What is an array ? Explain declaration and initialization of one dimensional array with example. **(5+5+5)**

Unit – III

6. a) Differentiate the following with examples :

      i) Actual parameter and formal parameter

      ii) Local and global variables.

   b) Explain the general syntax of a user defined function with arguments and no return value. Give example.

   c) Explain the following storage classes :

      i) Register

      ii) Static

   (5+5+5)

7. a) Explain any four string functions with syntax and example.

   b) Explain the different ways to read a string from keyboard.

   c) Write a C program to find the factorial of a number using a recursive function. (5+5+5)

Unit – IV

8. a) What is a structure ? How do you define and access the members of a structure ? Explain with an example.

   b) What is a macro ? Explain argumented macro with syntax and example.

   c) Write a note on Pointer. (5+5+5)

9. a) What is the primary advantage of using a data file ? What are the different modes of opening a file in C ?

   b) What do you mean by the following terms ? Give example.

      i) Nested structures

      ii) Union.

   c) Explain the use of the following functions :

      i) fopen()

      ii) fprintf()

      iii) getw()

      iv) putw(). (5+5+5)

Reg. No.

BSCCSC 152

Credit Based Second Semester B.Sc. Degree Examination, December 2021 (2018 – 19 and Earlier Batches)

COMPUTER SCIENCE

Paper – II : Programming in C

Time : 3 Hours

Max. Marks : 80

PART – A

1. Answer **any ten** of the following. **(10×2=20)**

   a) Write any four symbols used in flow charts with their meaning.

   b) What is C token ? List the different types of C tokens.

   c) List any four features of C Language.

   d) What is ternary operator ? Give an example.

   e) Differentiate between X++ and ++X.

   f) What are nested loops ? Give an example.

   g) Differentiate an array and structure.

   h) Write the use of sizeof() operator.

   i) What are local and global variables ?

   j) What is pointer ? How is pointer variable declared ?

   k) What are preprocessor directives ? Give an example.

   l) What is File ? How do you declare a file ?

PART – B

Answer **any one full** question from **each** Unit.

Unit – I

2. a) What is Flow chart ? Draw the flow chart to find the maximum of two numbers.

   b) Explain the integer and real data types in C with examples.

   c) Explain different arithmetic and logical operators with example. **(4+4+7)**

P.T.O.

3. a) Explain scanf() and printf() with syntax and example.

   b) What is an identifier ? What are the rules for naming an identifier ?

   c) Determine the value of each of the following logical expression

   if a = 7, b = 12 and c = – 3

   i) a > b && a < c

   ii) a < b && ! (a > c)

   iii) a==c || b > a

   iv) b > 15 && c < 0 || a > 0. **(5+6+4)**

Unit – II

4. a) Explain switch statement with syntax and example.

   b) Explain the break and continue statement with respect to loop, with syntax and example.

   c) Write a program to sort 'n' numbers in ascending order. **(5+5+5)**

5. a) What is an array ? How do you initialize the two dimensional array ? Explain with syntax and example.

   b) Write a program to search a number in an array.

   c) Explain while and do while loop with an example. **(5+5+5)**

Unit – III

6. a) Explain any five string handling functions in C with syntax and example.

   b) What is a user defined function ? Explain different categories of user defined functions.

   c) Write a C program to find the factorial of a number. Use this function in the main program to find value of nCr. **(5+5+5)**

7. a) What are storage classes ? Explain any two storage classes with example.

   b) What is a recursion ? Explain with an example.

   c) What is a string ? How do you declare string variable in C ? Give an example. **(5+5+5)**

Unit – IV

8. a) How do you define structure in C ? Explain with an example.

   b) What do you mean by pointer arithmetic ? Explain how is it different from other integer arithmetic.

   c) What is a macro ? Write a macro to find the largest of two numbers. **(6+5+4)**

9. a) Differentiate the following :

      i) scanf() and fscanf()

      ii) gets() and fgets()

      iii) printf() and fprintf()

      iv) putw() and getw()

   b) Explain in detail, different modes of opening file with example. **(8+7)**

Reg. No. | | | | | | | | | |

BCACAC 156

Credit Based II Semester B.C.A. Degree Examination, December 2021
(Common to all Batches)
BASICS OF NETWORKING

Time : 3 Hours | Max. Marks : 80

Instructions : *Answer* ***any ten*** *questions from Part – **A** and* ***any one full*** *question from* ***each*** *Unit of Part – **B**.*

PART – A **(10×2=20)**

1. a) Differentiate hub and switch.
   b) Write any two advantages of star topology.
   c) Define subnetting.
   d) Differentiate class I and class II repeaters.
   e) What is broadcasting ?
   f) List any two features of T3 lines.
   g) What are the categories of VSAT devices ?
   h) Expand POTS and PAMA.
   i) Define Network Operating System.
   j) What are the functions of User Accounts ?
   k) What is the purpose of IIS ?
   l) List the types of user accounts in Windows 2000.

PART – B **(4×15=60)**

Unit – I

2. a) Explain any five hardware components of networking.
   b) Explain different layers of TCP/IP reference model.
   c) What is Access Point ? Explain its functions. **(5+6+4)**

3. a) Explain star topology. List its advantages and disadvantages.
   b) Explain single mode and multimode transmission.
   c) What are the uses of computer networking ? **(5+6+4)**

P.T.O.

Unit – II

4. a) Explain the working of FDDI.
   b) Write a note on basic classes of IP address.
   c) Explain the feature of HTTP. (5+6+4)

5. a) Explain the working of ARCnet.
   b) Write a note on Fast Ethernet and Gigabit Ethernet.
   c) Explain the feature of NetBUI. (5+6+4)

Unit – III

6. a) Explain the feature of ISDN.
   b) Explain with diagram how networks are connected with infrared.
   c) What is Gateway ? List and explain types of Gateways. (5+5+5)

7. a) Explain the working of router with a neat diagram.
   b) Write a note on PPP.
   c) Describe important differences between LAN and WAN technologies. (5+5+5)

Unit – IV

8. a) Explain the steps involved in creation of Group User Accounts.
   b) List and explain features of Windows 2000 Server.
   c) Briefly explain the working of WINS. (7+5+3)

9. a) Explain the different steps involved in sharing a printer on the Server.
   b) Explain DNS hierarchy with a neat diagram.
   c) Explain the feature of Novell Netware. (7+5+3)

Reg. No. | | | | | | | | | |

BCACACN 201

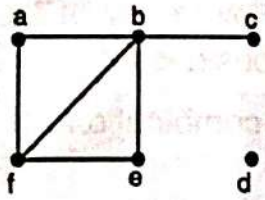
Second Semester B.C.A. Degree Examination, September 2022
(NEP – 2020) (2021-22 Batch Onwards)
DISCRETE MATHEMATICAL STRUCTURES (DSCC)

Time : 2 Hours Max. Marks : 60

Note : *Answer **any six** questions from Part – **A** and **one full** question from **each** Unit in Part – **B**.*

PART – A **(6×2=12)**

1. a) Write which of these is a tautology or a fallacy i) $p \vee \neg p$ ii) $p \wedge \neg p$.
   b) Write the power set of A = {1, 2}.
   c) Define partial order relation. Give an example.
   d) What is Pigeonhole principle ? Give an example.
   e) What is the probability that when two dice are rolled, the sum of the numbers on the two dice is 7 ?
   f) Define prime and composite number.
   g) Define degree of a vertex, with an example.
   h) Find isolated and pendant node in the graph :



PART – B

UNIT – I

2. a) Using truth table, show that $(p \wedge q) \Rightarrow p$ and $p \Rightarrow (p \vee q)$ are both tautologies, where p and q are any two statements.
   b) A = {3, 4, 5, 17}, B = {1, 2, 3}, C = {x|x is an integer and $0 \leq x \leq 5$} write $A \cup B$, $A \cup C$.
   c) R = {<1, 2>, <3, 4>,<2, 2>}, S = {<4, 2>, <2,5>, <3,1>, <1, 3>}. Write R∘S and S∘S.

(4+4+4)

P.T.O.

3. a) With the help of truth table, prove that $p \Rightarrow (q \wedge r) \equiv (p \Rightarrow q) \wedge (p \Rightarrow r)$.

   b) $R = \{<1, 1>, <1, 2>, <1,4>, <2,1>, <2, 2>, <2, 3>, <3, 2>, <3, 3>, <4, 2>, <4, 4>\}$ Construct relation matrix of R and draw digraph of R.

   c) $A = \{1, 2, 3\}$, $B=\{1, 2, 5, 7, 9\}$. Write $A - B$, $A + B$, $A \cup B$, $A \cap B$. **(4+4+4)**

UNIT – II

4. a) Draw the Hasse diagram of the set A, under the partial ordering relation "divides" and indicate those which are totally ordered. $A = \{1, 2, 3, 6, 12\}$.

   b) A multiple-choice test contains 10 questions. There are four possible answers for each question. A) In how many ways can a student answer the questions on the test if the student answers every question ? B) In how many ways can a student answer the questions on the test if the student can leave answers blank ?

   c) Show that functions $f(x) = x^3$ and $g(x) = x^{1/3}$ for $x \in R$ are inverse of one another. **(4+4+4)**

5. a) Let $X = \{1, 2, 3\}$ f, g, h and s are the functions from X to X given by

   $f = \{(1, 2), (2, 3),(3, 1)\}$, $h=\{(1,1),(2, 2), (3, 1)\}$, $g = \{(1,2), (2, 1),(3, 3)\}$, $s = \{(1, 1), (2, 2), (3,3)\}$. Find $f \circ g$, $g \circ f$, $s \circ s$ and $f \circ s$.

   b) A computer company receives 350 applications from computer graduates for a job planning a line of new web servers. Suppose that 220 of these applicants majored in computer science, 147 majored in business, and 51 majored both in computer science and in business. How many of these applicants majored neither in computer science nor in business ?

   c) Let $S = \{1, 2, 3, 4, 5\}$. List all the 3-permutations and 3-combinations of S. **(4+4+4)**

UNIT – III

6. a) Find the probability that a hand of five cards in poker contains four cards of one kind.

   b) What is the conditional probability that a family with two children has two boys, given they have at least one boy ?

   c) Find the greatest common divisor of 414 and 662 using the Euclidean algorithm. **(4+4+4)**

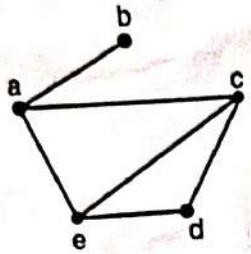
7. a) Are the random variables x_1 and x_2 independent, if the sum of the numbers that appear when a tair of fair dice is rolled ?

b) Use mathematical induction to prove that $2n < n!$ for every integer n with $n \geq 4$.

(6+6)

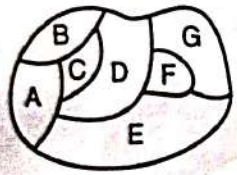
UNIT – IV

8. a) Write adjacency list and adjacency matrix to describe the simple graph given in the figure.

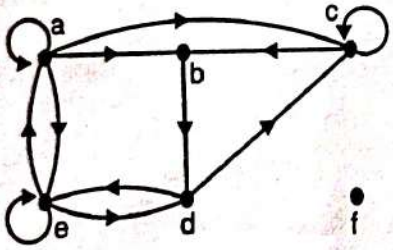


b) Construct the dual graph for the given map.

(6+6)

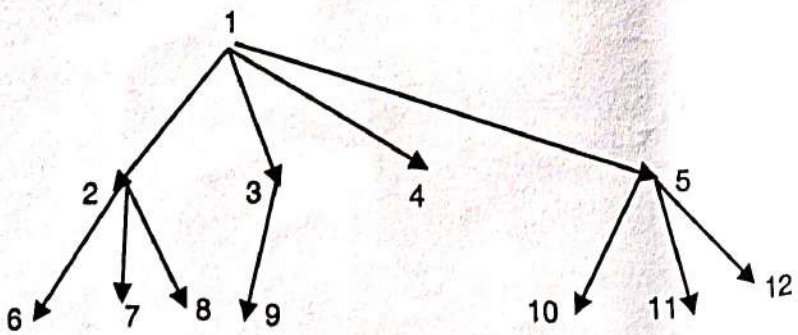


9. a) Find the in-degree and out degree of each vertex in the graph G with directed edges as shown in the figure.



(6+6)

b) Convert the following tree into a binary tree.



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BCACACN 203

Second Semester B.C.A. Degree Examination, September 2022
(NEP-2020) (2021 – 22 Batch Onwards)
OBJECT ORIENTED CONCEPTS USING JAVA (DSCC)

Time : 2 Hours | Max. Marks : 60

Note : *Answer **any six** questions from Part – **A** and **one full** question from **each** Unit in Part – **B**.*

PART – A (6×2=12)

1. a) Define the terms :
   i) Data Encapsulation
   ii) Data Abstraction.
   b) What is stream ? List different types of streams in Java.
   c) What is vector ? How it is different from array ?
   d) What are constructors ? Mention types of constructors in Java.
   e) What is the purpose of keyword super and super () ?
   f) List any four API packages of Java.
   g) Give the syntax of Applet tag.
   h) List the two key features of a swing GUI.

PART – B

Unit – I

2. a) Explain various features of OOP.
   b) List and explain different primitive data types available in Java. (6+6)
3. a) Explain any 6 features of Java.
   b) Explain the increment, decrement and conditional operator with syntax and example. (6+6)

P.T.O.

Unit – II

4. a) Explain for loop with syntax and example.
   b) What are arrays ? Explain how to declare instantiate initialize and use a one-dimensional array with suitable code example.
   c) Write the general form of a class. Explain how to define a class in Java with suitable example. (4+5+3)

5. a) Explain any two string methods in Java with suitable example.
   b) Explain method overloading with suitable example.
   c) Explain do while loop with syntax and example. (4+5+3)

Unit – III

6. a) What is inheritance ? Explain multi-level inheritance with suitable example.
   b) Explain the life cycle of a Thread with diagram. (6+6)

7. a) Explain how to create and implement interface using suitable example.
   b) Explain exception handling using try/catch with suitable example. (6+6)

Unit – IV

8. a) List and explain any 6 methods defined by Applet.
   b) Explain how any two Mouse events are handled in java with suitable example. (6+6)

9. a) List and explain the components of Delegation Event Model.
   b) Explain following swing components with any two methods associated with it.
      i) JTextField
      ii) Jlist
      iii) JRadioButton. (6+6)

Reg. No. | | | | | | | | | |

BCACACN 202

Second Semester B.C.A. Degree Examination, September 2022
(NEP – 2020) (2021 – 22 Batch Onwards)
DATA STRUCTURE USING C (DSCC)

Time : 2 Hours Max. Marks : 60

Note : *Answer* ***any six*** *questions from Part –* ***A*** *and* ***one full*** *question from* ***each*** *Unit in Part –* ***B***.

PART – A

1. a) Define linear data structure and non linear data structure. **(2×6=12)**
   b) What is sparse matrix ? Give example.
   c) What is a Circular Linked List ? Give diagrammatic representation of a circular linked list.
   d) Differentiate linear search and binary search.
   e) Define Dequeue. What are its types ?
   f) Write prefix and postfix of :
   (X + Y/Z * W ^ P).
   g) What is binary search tree ? Give an example.
   h) Define the following :
      i) Leaf node
      ii) Directed graph.

PART – B
Unit – I

2. a) Given a two dimensional array A[10] [20], base address of A being 1000 and width of each element is 4 bytes, find the location of A[8] [10] when the array is stored in (i) row wise (ii) column wise.
   b) List the properties of recursive function. Write a recursive algorithm to find the factorial of a number.
   c) Write bubble sort algorithm. Explain with an example. **(4+4+4)**

P.T.O.

3. a) Explain the memory representation of one dimensional array.

   b) Explain algorithmic notations for selection control structure.

   c) Trace the following numbers using insertion sort :

   70, 11, 33, 77, 88, 22.

(4+4+4)

Unit – II

4. a) Write and explain an algorithm to search for an element in a given list of N numbers using linear search method.

   b) Explain with a neat diagram to delete a node following a given node in a singly linked list.

   c) Explain memory representation of linked list in memory with a neat diagram.

(4+4+4)

5. a) Write a note on singly linked list.

   b) Write binary search algorithm to search for an element in a given list of N numbers.

   c) Write an algorithm to insert a node at the beginning of a singly linked list.

(4+4+4)

Unit – III

6. a) What is a Queue ? Write algorithms to insert and delete an item into/from a linear queue.

   b) Evaluate the following postfix expression using STACK :

   3, 1, +, 2, ^, 7, 4, –, 2, *, +, 5. – **(6+6)**

7. a) What is a Stack ? Write algorithms to implement STACK operations using array.

   b) Write and explain an algorithm to convert given infix expression to postfix expression using STACK with an example. **(6+6)**

Unit – IV

8. a) Write recursive algorithms to perform preorder and postorder traversal of a binary tree.

   b) Given the following traversals of a binary tree, write the corresponding binary search tree. Also write post order traversal.

   PRE ORDER : A B C D E F G H I

   IN ORDER : D C E B A F H I G

   c) Write an algorithm for breadth first search for a graph. **(4+4+4)**

9. a) Draw a binary search tree for the following list of numbers and traverse it in Preorder, Inorder and Postorder :

   40, 50, 33, 99, 22, 77, 60, 11, 55

   b) What is adjacency matrix and path matrix ? Give an example for each.

   c) Write an algorithm for a depth first search for a graph. **(5+3+4)**

Reg. No. | | | | | | | | | |

BSCBOC 152

Credit Based II Semester B.Sc. Degree Examination, December 2021
(2018 – 19 and Earlier Batches)
BOTANY
Mycology, Plant Pathology and Bryophyta

Time : 3 Hours Max. Marks : 80

Instructions : *1) Answer Part – **A** and Part – **B**.*

*2) Answer **four full** questions from Part – **B**. Choosing **one full** question from **each** unit.*

*3) **All** questions in Part – **B** carry **equal** marks.*

*4) Draw diagrams **wherever** necessary.*

PART – A

1. Answer **any ten** of the following : **(10×2=20)**

a) What is Heterokont Fungi ? Give an example.

b) Write the systematic position of **PEZIZA**.

c) What is sterigmata ?

d) Name the two types of lichens based on fungal partner.

e) What is Macrocyclic life cycle ? Give an example.

f) Give any two examples for edible mushrooms.

g) Write any two control measures of leaf rust of coffee.

h) Name a plant pathogenic nematode and disease caused by it.

i) What are perichaetial leaves ?

j) Name any two seed borne bacterial pathogens.

k) Write any two features by which thallus of **RICCIA** and **ANTHOCEROS** can be distinguished externally.

l) Mention any two features of Bryophytes.

P.T.O.

PART – B

Unit – I

2. a) Explain any four salient features of fungi. 4
   b) With a neat labelled diagram. Explain perithecium in **XYLARIA**. 4
   c) Describe sexual reproduction in **RHIZOPUS**. 7

OR

3. a) Write a note on Plectenchyma. 3
   b) Explain the types of Antheridia in **PHYTOPHTHORA**. 5
   c) Give an account of ascocarp formation in **PENICILLIUM**. 7

Unit – II

4. a) Write a note on Cephalodium. 3
   b) Give an account of economic importance of fungi. 5
   c) Explain the uredinial and telial stages of **PUCCINIA**. 7

OR

5. a) Mention the stages involved in the cultivation of mushrooms. 3
   b) Distinguish between Homeomerous and Heteromerous Lichens with the help of labelled diagram. 5
   c) Explain Pycnidial and Aecedial stages of **PUCCINIA**. 7

Unit – III

6. a) Write a note on Biopesticide with special reference to neem. 4
   b) Explain the types of seed borne diseases. 4
   c) Explain the symptoms and control measures of disease caused by **PHYTOPHTHORA ARECAE** and **PYRICULARIA ORYZAE**. 7

OR

7. a) Name the causative agent and control measures of budrot of Coconut Palm. 3
   b) Name the Pathogen, and explain the mode of transmission and disease management of Katte Disease of Cardamom. 5

c) Explain the following : 7

i) Trichoderma as a Biocontrol Agent.

ii) Citrus Canker.

Unit – IV

8. a) Explain the structure of sex organs in **ANTHOCEROS**. 4

b) Explain the importance of Bryophytes in soil conservation. 4

c) Describe the structure of Gametophyte of moss and add a note on protonema. 7

OR

9. a) Write a note on Mucilaginous Cavities in **ANTHOCEROS**. 3

b) Explain Vegetative Reproduction in **FUNARIA**. 5

c) Describe the internal structure of sporophyte of **PORELLA** with the help of labelled sketch. 7

Reg. No. | | | | | | | | | |

BSCMBCN 201

II Semester B.Sc. Examination, September 2022
(NEP – 2020) (2021-22 Batch Onwards)
MICROBIOLOGY
Microbial Biochemistry and Physiology (DSCC)

Time : 2 Hours | Max. Marks : 60

Note : *Answer on* ***complete*** *set of questions from* ***each*** *Unit. Draw diagrams* ***wherever*** *necessary.*

UNIT – I

1. a) What is an acid ? Give an example. **(2+5+8=15)**
   b) Explain the covalent and non-covalent bond with examples to each.
   c) Discuss the properties of water.

OR

2. a) Mention the primary characteristics of carbon. **(2+5+8=15)**
   b) Explain the structure of water and justify 'Water is an universal solvent'.
   c) Comment on the pH. Add a note on Hunderson-Hasselbalch equation.

UNIT – II

3. a) What are the functions of haemoglobin ? **(2+5+8=15)**
   b) Write a note on classification of lipids.
   c) Describe the secondary structural organization of proteins.

OR

4. a) What are non-essential amino acids ? Give any two examples. **(2+5+8=15)**
   b) Define and classify the vitamins.
   c) Explain any four properties of carbohydrates.

P.T.O.

UNIT – III

5. a) What are macronutrients ? Give any two examples. **(2+5+8=15)**
   b) How are the microorganisms classified based on nutritional requirements ?
   c) What is generation time ? Describe the bacterial growth curve.

OR

6. a) Write a short note on DMC. **(2+5+8=15)**
   b) Explain the effect of pH on microbial growth.
   c) What is viable count ? Describe serial dilution agar plating technique in detail.

UNIT – IV

7. a) What are the exothermic and endothermic reactions ? **(2+5+8=15)**
   b) What are the components of ETC ?
   c) Describe the mechanism of oxygenic bacterial photosynthesis.

OR

8. a) What are high energy compounds ? Give examples. **(2+5+8=15)**
   b) Differentiate between homolactate and heterolactate fermentations.
   c) Explain glycolytic pathway in detail.

Reg. No. | | | | | | | | | |

BFDFDCN 201

II Semester B.Sc. (FD and AD) Examination, September 2022
(NEP – 2020)
(2021-22 Batch Onwards)
DYEING AND PRINTING IN TEXTILES (DSCC)

Time : 2 Hours | Max. Marks : 60

SECTION– A

I. Answer **any two** of the following : **(10×2=20)**

1) Explain about singeing and desizing process of cellulosic fibers.

2) What is water pollution ? Explain social responsibility of controlling water pollution in textile industry.

3) What is printing ? Explain any two types of printing methods.

4) What is washing ? Explain any two types of washing methods.

SECTION – B

II.Answer any four of the following : **(6×4=24)**

5) Explain shrinkage control.

6) Explain about bleaching.

7) Explain tie and dye method.

8) What is calendering ? Explain.

9) Explain about batik.

10) Explain about dyeing process using acid dyes.

P.T.O.

SECTION – C

III. Answer **any 4** of the following : **(4×4=16)**

11) Explain soil release finishes.

12) Explain about stain removal.

13) Explain about scouring.

14) Explain about marbling.

15) Explain about softening.

16) Explain about solid waste pollution.

Reg. No. | | | | | | | | | |

BFDFDCN 202

II Semester B.Sc. (FD) Examination, September 2022
(NEP-2020) (2021 – 22 Batch Onwards)
FASHION DESIGN AND ILLUSTRATION (DSCC)

Time : 2 Hours

Max. Marks : 60

PART – A

I. Answer **any 2** of the following : **(10×2=20)**

1) Discuss about any 2 well-known fashion illustrators.

2) Write a note on fashion seasons – Winter, Summer, Spring, Autumn.

3) Write about international designers Gianni Versace, Coco chanel.

4) Discuss about the different body types.

PART – B

II. Answer **any 4** of the following : **(6×4=24)**

5) Explain these terminologies :

a) Social Media.

b) Fashion Magazines.

c) Care Label.

6) Write about designer Ritu Kumar.

7) Discuss about social influence in clothing.

P.T.O.

8) Illustrate 10 head fashion figure for female.

9) Write the difference between fashion designer and stylist.

10) Discuss about clothing category based on styling.

PART – C

III. Answer **any 4** of the following : (4×4=16

a) Fashion show.

b) Mannequin.

c) Yokes.

d) Size Label.

e) Skirts.

f) RTW.

g) Lingerie.

Reg. No. | | | | | | | | | |

BSCCSCN 201

Second Semester B.Sc. Degree Examination, September 2022
(NEP – 2020)
(2021 – 22 Batch Onwards)
COMPUTER SCIENCE – 2
Data Structures Using C (DSCC)

Time : 2 Hours | Max. Marks : 60

Note : *Answer* ***any six*** *questions from Part –* ***A*** *and* ***one full*** *question from* ***each*** *Unit of Part –* ***B****.*

PART – A

(6×2=12)

1. a) What is a recursion ?
   b) What is sparse matrix ? Give example.
   c) Give two advantages of linked list over arrays.
   d) What is two-way list ? Write the use of it.
   e) Mention the applications of a queue.
   f) What is meant by priority queue ? What is its use ?
   g) Define complete binary tree. Give an example.
   h) Mention the application of graphs.

PART – B

Unit – I

2. a) Write an algorithm to sort a list of numbers using quick sort.
   b) Write the recursive algorithm to find the GCD of a number. **(6+6)**

3. a) Trace the following list of numbers using bubble sort.
      6, 20, 14, 16, 22, 10, 89
   b) Explain any four operations performed by data structure.
   c) Explain linear and non-linear data structures with examples. **(5+4+3)**

P.T.O.

Unit – II

4. a) Draw the different types of linked lists with diagram.
   b) Write an algorithm for insert a node in between in doubly linked list.
   c) Explain linear search with an example. **(4+4+4)**

5. a) Write an algorithm to insert a node at end of singly linked list.
   b) Explain any two dynamic memory handling functions in C.
   c) How do you represent a polynomial using a linked list ? Explain with an example. **(5+4+3)**

Unit – III

6. a) How do you represent linked queue ? Write algorithms for insert and delete operations.
   b) Write an algorithm to convert infix to postfix expression. **(6+6)**

7. a) Write an algorithm to PUSH and POP elements from a stack using arrays.
   b) Convert following infix expression to postfix.
      i) (A + B) * (C ^ D)/E + F)
      ii) A + (B * C/D)* E **(6+6)**

Unit – IV

8. a) Draw the binary tree for the following inorder and preorder traversal.
      Inorder : C B D A I F E G H
      Preorder : A B C D E F I G H
   b) Explain the two possible ways by which the graph can be represented. **(6+6)**

9. a) Explain breadth first search algorithm.
   b) Define the following with respect to tree.
      i) node
      ii) siblings
      iii) degree of a tree
      iv) edge. **(6+6)**

Reg. No. | | | | | | | | | |

COMEVSN 201

II Semester All UG Courses Degree Examination, September 2022
(NEP – 2020) (2021 – 22 Batch Onwards)
ENVIRONMENTAL STUDIES (SEC)

Time : 2 Hours

Max. Marks : 30

SECTION – A

ವಿಭಾಗ - ಎ

Note : Answer **any five** of the following, **each not** exceeding **2 – 3** sentences. **(2×5=10)**

ಕೆಳಗಿನ ಯಾವುದಾದರೂ **ಐದು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ, ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ **2 – 3** ವಾಕ್ಯಗಳಲ್ಲಿ ಉತ್ತರಿಸಿ.

1. What do you mean by "Environment" ?
   ಪರಿಸರ ಎಂದರೇನು ?

2. What are the types of food chain ?
   ಆಹಾರ ಸರಪಳಿಯ ವಿಧಗಳು ಯಾವುವು ?

3. What is meant by energy resources ?
   ಶಕ್ತಿಯ ಸಂಪನ್ಮೂಲದ ಅರ್ಥವೇನು ?

4. What is the meaning of Bio-diversity hotspot ?
   ಜೀವವೈವಿಧ್ಯ ಬಿಸಿತಾಣದ ಅರ್ಥವೇನು ?

5. Define Pollution.
   ಮಾಲಿನ್ಯವನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ.

6. Write any two uses of ozone layer.
   ಓಜೋನ್ ಲೇಯರ್‌ನ ಎರಡು ಉಪಯೋಗಗಳನ್ನು ಬರೆಯಿರಿ.

7. Give the meaning of disaster management.
   ವಿಪತ್ತು ನಿರ್ವಹಣೆಯ ಅರ್ಥವೇನು ?

8. What is environmental ethics ?
   ಪರಿಸರ ನೀತಿ ಎಂದರೇನು ?

P.T.O

SECTION – B

ವಿಭಾಗ - ಬಿ

Answer the following, **each not** exceeding **two** pages. **(5×4=20)**

ಈ ಕೆಳಗಿನ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ, ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಯು **ಎರಡು** ಪುಟಕ್ಕೆ ಮೀರದಂತೆ ಉತ್ತರಿಸಿರಿ.

9. a) State the importance of Environmental Studies.
ಪರಿಸರ ಅಧ್ಯಯನದ ಪ್ರಾಮುಖ್ಯತೆಗಳೇನು ?

OR/ಅಥವಾ

b) Write the types of Ecosystem.
ಪರಿಸರ ವ್ಯವಸ್ಥೆಯ ವಿಧಗಳನ್ನು ಬರೆಯಿರಿ.

10. a) State in brief the factors influencing soil erosion.
ಮಣ್ಣಿನ ಸವಕಳಿಗೆ ಕಾರಣವಾಗುವ ಅಂಶಗಳನ್ನು ವಿವರಿಸಿ.

OR/ಅಥವಾ

b) What are the threats of Biodiversity ? Explain.
ಜೀವವೈವಿಧ್ಯದ ಮೇಲಿನ ಅಡೆತಡೆಗಳು ಯಾವುವು ? ವಿವರಿಸಿ.

11. a) Write a note on sources of water pollution.
ಜಲಮಾಲಿನ್ಯಕ್ಕೆ ಕಾರಣವಾಗುವ ಮೂಲಗಳ ಬಗೆಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

OR/ಅಥವಾ

b) Briefly explain the causes of climate change.
ಹವಾಮಾನ ಬದಲಾವಣೆಯ ಕಾರಣಗಳನ್ನು ವಿವರಿಸಿ.

12. a) Explain chipko movement.
ಚಿಪ್ಕೋ ಚಳುವಳಿಯನ್ನು ವಿವರಿಸಿ.

OR/ಅಥವಾ

b) Write a note on kyoto protocols.
ಕ್ಯೂಟೋ ನಿಬಂಧನೆಯ ಬಗೆಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

Reg. No. | | | | | | | | | |

BSCMTCN 201

II Semester B.Sc. Degree Examination, September 2022
(NEP 2020) (2021 – 22 Batch Onwards)
MATHEMATICS
Number Theory – II, Algebra – II and Calculus – II (DSCC)

Time : 2 Hours Max. Marks : 60

Instructions : 1) *Answer **any ten** questions from Part – **A**. **Each** question carries **2** marks.*
2) *Answers to Part – **A** should be written in the first few pages of the answer book before answers to Part – **B**.*
3) *Answer **any eight** questions from Part – **B**, choosing **two** questions from **each** Unit. **Each** question carries **5** marks.*
4) *Use of scientific calculator is **permitted**.*

PART – A

(10×2=20)

1. If p is a prime, then prove that $a^p \equiv a \pmod{p}$ for any integer a.
2. If p is a prime and $k > 0$, then prove that $\phi(p^k) = p^k - p^{k-1}$.
3. Calculate $\phi(1001)$.
4. If $n = 160$, find the sum of integers less than n and relatively prime to n.
5. In a group G, prove the following :
   i) $(a^{-1})^{-1} = a, \forall\, a \in G$.
   ii) $(ab)^{-1} = b^{-1}a^{-1}, \forall\, a, b \in G$.
6. If H and K are subgroups of G, then prove that $H \cap K$ is also a subgroup of G.
7. Prove that every cyclic group is an abelian group.
8. Find $\lim\limits_{(x,y)\to(0,0)} \dfrac{x^2 - xy}{\sqrt{x} - \sqrt{y}}$.

P.T.O.

9. Find $\frac{\partial^2 f}{\partial x^2}$ if $f(x, y) = x^2 + 3xy + y - 1$.

10. Find $\frac{\partial z}{\partial x}$ if the equation $yz - \ln z = x + y$.

11. Evaluate $\int_C (3x^2 - 2y + z)ds$, where C is the line segment joining from (0, 0, 0) to (2, 2, 2).

12. Evaluate $\int_0^{\pi}\int_0^{x} x \sin y \, dy \, dx$.

13. Evaluate $\iint_R dy \, dx$, where R is the region bounded by $y = 2x^2$ and $y^2 = 4x$.

14. Evaluate $\int_0^1 \int_0^{1-y} \int_0^2 dx \, dz \, dy$.

PART – B

Unit – I

15. State and prove Euler's theorem.

16. If p is a prime, then prove that $(p - 1)! \equiv -1 \pmod{p}$.

17. For each positive integer $n \geq 1$, then prove that $n = \sum_{d|n} \phi(d)$, the sum being extended over all positive divisors of n.

18. Express $\frac{187}{57}$ as a finite simple continued fraction.

Unit – II

19. Let H and K be subgroups of a group G. Then prove that HK is a subgroup of G, if and only if, HK = KH.

20. Prove that a subgroup of cyclic group is a cyclic group.

21. Let H and K be subgroups of a group G such that HK is a subgroup of G, then prove that $o(HK) = \frac{o(H)o(K)}{o(H \cap K)}$.

22. Define a centre of a group. Prove that the centre Z(G) of a group G is a subgroup of G.

Unit – III

23. Applying the two-path test, show that the function $f(x,y) = \frac{2x^2y}{x^4 + y^2}$ has no limit as $(x, y) \to (0, 0)$.

24. If $f(x, y) = x \cos y + ye^x$, find $\frac{\partial^2 f}{\partial x^2}, \frac{\partial^2 f}{\partial y \partial x}, \frac{\partial^2 f}{\partial y^2}, \frac{\partial^2 f}{\partial x \partial y}$.

25. If $w = x + 2y + z^2$, $x = \frac{r}{s}$, $y = r^2 + \ln s$, $z = 2r$, then find $\frac{\partial w}{\partial r}$ and $\frac{\partial w}{\partial s}$.

26. Find the local extreme values of the function $f(x, y) = xy - x^2 - y^2 - 2x - 2y + 4$.

Unit – IV

27. Find the volume of the prism whose base is the triangle in the xy – plane bounded by the x – axis and the lines $y = x$ and $x = 1$ and whose top lies in the plane.

28. Evaluate $\iint_R f(x,y)dA$, where $f(x, y) = x^2 + y^2$ and R is the region at triangle with vertices (0, 0), (1, 0) and (0, 1).

29. By changing Cartesian integral into polar co-ordinates, evaluate $\iint_R e^{x^2+y^2} dy\, dx$, where R is the semicircular region bounded by the x – axis and the curve $y = \sqrt{1-x^2}$.

30. Evaluate $\int_0^3 \int_0^{\sqrt{9-x^2}} \int_0^{\sqrt{9-x^2}} dz\, dy\, dx$.

Reg. No. | | | | | | | | |

BSCMTC 153

Credit Based II Semester B.Sc. Examination, December 2021
(2018 – 19 and Earlier Batches) (Semester Scheme)
MATHEMATICS (Paper – II)
Calculus, Group Theory and Differential Equations

Time : 3 Hours

Max. Marks : 120

Instructions : *1) Answer **any ten** questions from Part – **A**. **Each** question carries **3** marks.*

*2) Answers to Part – **A** should be written in the **first** few pages of the answer book before answers to Part – **B**.*

*3) Answer **five full** questions from Part – **B** choosing one **full** question from **each** Unit.*

*4) Scientific calculators are **allowed**.*

PART – A

(3×10=30)

1. Verify the conditions of the mean value theorem for the function $f(x) = x + \frac{1}{x}$ in the interval [½, 1] and find the value of C satisfying the theorem.

2. Find the Cartesian equation of the polar curve $r = \frac{4}{2\cos\theta - \sin\theta}$.

3. Find $\lim_{x \to 0}\left(\frac{1}{\sin x} - \frac{1}{x}\right)$.

4. Find the volume of the solid generated by revolving the region $y = \sqrt{x}$, $y = 2$ and $x = 0$ about y-axis.

5. Find the length of the curve $x = t^3$, $y = 3t^2/2$ in $\left[0, \sqrt{3}\right]$.

6. Find the volume of the solid generated by revolving the region bounded by $y = x$, $y = 1$ and $x = 0$ about x-axis by Washers method.

P.T.O.

7. Find the generators of the group of set of non-zero integers modulo 5 w.r.to multiplication.
8. Prove that if G is cyclic group, then G is abelian.
9. Find a solution of the equation $ax = b$ in S_3, where $a = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix}$.
10. Check the exactness of the equation $(2xy - \tan y)\,dx + (x^2 - x\sec^2 y)dy = 0$.
11. Solve the differential equation $(x + y)dx + (x - y)dy = 0$.
12. Find the integrating factor of $(4xy + 3y^2 - x)dx + x(x + 2y)dy = 0$.
13. Find the orthogonal trajectories of family of straight lines with slope and y intercept equal.
14. Find the general solution of $y = px + f(p)$.
15. Solve $p^2 - x^2y^2 = 0$.

PART – B

Unit – I

1. a) State and prove Rolle's theorem. 6
   b) Graph the curve $r = 2(1 - \cos 2\theta)$. 6
   c) Find the area of the region inside the limacon $r = 4 + 2\cos\theta$. 6
2. a) State and prove Cauchy's mean value theorem. 6
   b) Graph the curve $r = 2 + \sin\theta$. 6
   c) Find the length of the cardioid $r = a(1 + \cos\theta)$. 6

Unit – II

3. a) Find the volume of the solid generated by revolving the region bounded by $y = \sqrt{x}$ and the lines $y = 1$, $x = 4$ about the line $y = 1$ using disk method. 6
   b) Find the volume of the solid generated by revolving the region bounded by the curve $y = x^2 + 1$ and the line $y = -x + 3$ about the x-axis using Washers method. 6
   c) The region in the first quadrant bounded by the curve $x = y - y^3$ and y-axis is revolved about x-axis to generate a solid. Find the volume using Shell method. 6

Reg. No. | | | | | | | | | |

BSCMTC 153

Credit Based II Semester B.Sc. Examination, December 2021
(2018 – 19 and Earlier Batches) (Semester Scheme)
MATHEMATICS (Paper – II)
Calculus, Group Theory and Differential Equations

Time : 3 Hours

Max. Marks : 120

Instructions : 1) Answer **any ten** questions from Part – **A**. **Each** question carries **3** marks.
2) Answers to Part – **A** should be written in the **first** few pages of the answer book before answers to Part – **B**.
3) Answer **five full** questions from Part – **B** choosing one **full** question from **each** Unit.
4) Scientific calculators are **allowed.**

PART – A

(3×10=30)

1. Verify the conditions of the mean value theorem for the function $f(x) = x + \frac{1}{x}$ in the interval [½, 1] and find the value of C satisfying the theorem.

2. Find the Cartesian equation of the polar curve $r = \frac{4}{2\cos\theta - \sin\theta}$.

3. Find $\lim_{x \to 0} \left(\frac{1}{\sin x} - \frac{1}{x} \right)$.

4. Find the volume of the solid generated by revolving the region $y = \sqrt{x}$, $y = 2$ and $x = 0$ about y-axis.

5. Find the length of the curve $x = t^3$, $y = 3t^2/2$ in $\left[0, \sqrt{3}\right]$.

6. Find the volume of the solid generated by revolving the region bounded by $y = x$, $y = 1$ and $x = 0$ about x-axis by Washers method.

P.T.O.

Unit – V

9. a) A thermometer reading 18°F is brought into a room, the temperature of which is 70°F. One minute later, the thermometer reading is 13°F. Determine the temperature reading five minutes after the thermometer is first brought into the room. 6

   b) Solve $yy'' + (y')^2 = 0$. 6

   c) Show that the p-discriminant of the equation $p^3 + Ap + B = 0$ is $4A^3 + 27B^2 = 0$. 6

10. a) Find the general solution and singular solution of $p^2 + 4x^5p - 12x^4y = 0$. 6

    b) Find the orthogonal trajectories of the family of $r = a\cos^2\theta$. 6

    c) Solve $x^2p^2 + xp - y^2 - y = 0$. 6

4. a) Find the volume of the solid generated by the region bounded between $y = \sqrt{x}$ and $y = x^2/8$ about x-axis. 6

b) If C is a smooth curve defined parametrically by $x = f(t)$ and $y = g(t)$, $a \le t \le b$. Derive an expression for length of C in the form $L = \int_a^b \sqrt{(f'(t))^2 + (g'(t))^2}\, dt$. 6

c) Find the volume of the solid generated by revolving the region of the triangle with vertices (1, 1), (1, 2) and (2, 2) about y-axis. 6

Unit – III

5. a) Prove that subgroup of a cyclic group is cyclic. 6

b) Let H and K be subgroups of a group G. Prove that HK is a subgroup of G if and only if HK = KH. 6

c) Let G be a group and H be a subset of G. Prove that H is a subgroup of G if and only if $ab^{-1} \in H$ whenever $a \in H$ and $b \in H$. 6

6. a) Let H be a finite subset of G such that $ab \in H$ whenever $a \in H$ and $b \in H$. Then prove that H is a subgroup of G. 6

b) Prove that an infinite cyclic group has exactly 2 generators. 6

c) i) Express (1 2 3) (2 4 6 8) (1 3 7 9) as a product of transpositions. 6

ii) Let G be a group and a, b, c are elements of G, prove that ab = ac implies b = c.

Unit – IV

7. a) Solve $y(x^2 + y^2 - 1)dx + x(x^2 + y^2 + 1)dy = 0$. 6

b) Solve $(9x - 4y + 4)dx - (2x - y + 1)dy = 0$. 6

c) Solve $2(y - 4x^2)dx + xdy = 0$. 6

8. a) Solve $3x(xy - 2)dx + (x^3 + 2y)dy = 0$. 6

b) Solve $(x - y)dx + (3x + y)dy = 0$ when $x = 2$ and $y = -1$. 6

c) Solve $y^2dx + (3xy + y^2 - 1)dy = 0$. 6

Unit – V

9. a) A thermometer reading 18°F is brought into a room, the temperature of which is 70°F. One minute later, the thermometer reading is 13°F. Determine the temperature reading five minutes after the thermometer is first brought into the room. 6

   b) Solve $yy'' + (y')^2 = 0$. 6

   c) Show that the p-discriminant of the equation $p^3 + Ap + B = 0$ is $4A^3 + 27B^2 = 0$. 6

10. a) Find the general solution and singular solution of $p^2 + 4x^5p - 12x^4y = 0$. 6

    b) Find the orthogonal trajectories of the family of $r = a\cos^2\theta$. 6

    c) Solve $x^2p^2 + xp - y^2 - y = 0$. 6

Reg. No. | | | | | | | | | |

BSCMTC 153

Credit Based II Semester B.Sc. Degree Examination, September 2022
(2018 – 19 & Earlier Batches)
MATHEMATICS
Calculus, Group Theory and Differential Equations

Time : 3 Hours Max. Marks : 120

Instructions : 1) *Answer* ***any ten*** *questions from Part* ***A***. ***Each*** *question carries* ***3*** *marks.*

2) *Answers to Part* ***A*** *should be written in the* ***first few*** *pages of the answer book before answers to Part* ***B***.

3) *Answer* ***five full*** *questions from Part* ***B*** *choosing* ***one full*** *question from* ***each*** *Unit.*

4) *Scientific calculators are* ***allowed***.

PART – A

Answer **any ten** questions : **(10×3=30)**

1. Find a value of c, satisfying mean value theorem for the function, $f(x) = x^2 + 2x - 1$ in [0, 1].

2. Find $\lim_{x \to 0} \frac{x - \sin x}{x^3}$.

3. Convert $(x-2)^2 + y^2 = 4$ to polar form.

4. Find the volume of the solid generated by revolving the region between Y axis and the curve $x = 2\sqrt{y}$ about Y axis where $0 \leq y \leq 4$.

5. Find the volume of the solid generated by revolving the region bounded by $y = x$, $y = 1$ and $x = 0$ about the x-axis by Washer method.

6. Find the length of the curve $y = x^{3/2}$, $0 \leq x \leq 1$.

7. If G is a group and $a \in G$, $b \in G$ then prove that
   i) $(a^{-1})^{-1} = a$ ii) $(ab)^{-1} = b^{-1}a^{-1}$.

8. If H and K are subgroups of a group G prove that $H \cap K$ is also a subroup of G.

P.T.O.

9. Write the permutation

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 8 & 6 & 1 & 5 & 7 & 2 & 4 & 3 \end{pmatrix}$$

as a product of transpositions.

10. Solve $\frac{dy}{dx} = xy^2$.

11. Check the exactness of the differential equation $(2xy - 3x^2)dx + (x^2 + y)dy = 0$.

12. Find the integrating factor of $(y - \cos^2 x)dx + \cos x\, dy = 0$.

13. Find the orthogonal trajectories of the family of curves $x^2 + y^2 = c$.

14. Solve $x^2p^2 - y^2 = 0$.

15. Solve $y = px + p^3$.

PART – B

Unit – I

1. a) State and prove Cauchy mean value theorem. 6

   b) Evaluate :

   i) $\lim_{x \to 0}\left(\frac{1}{\sin x} - \frac{1}{x}\right)$

   ii) $\lim_{x \to 0} \frac{x(\cos x - 1)}{\sin x - x}$. 6

   c) Find the area of the region in polar co-ordinates shared by polar curve $r = 2(1 - \cos\theta)$ and the circle $r = 2$. 6

2. a) State and prove Rolle's theorem. 6

   b) Draw the graph of $r = 1 - \sin\theta$. 6

   c) Find the length of the cardioid $r = a(1 + \cos\theta)$. 6

Unit – II

BSCMTC 153

3. a) Find the volume of the solid generated by revolving the region bounded by the parabola $x = y^2 + 1$ and the line $x = 3$ about the line $x = 3$ by Disk method. 6

   b) Find the volume of the solid generated by revolving the triangular region formed by the vertices (1, 1) (1, 2) (2, 2) about Y axis by Shell method. 6

   c) If a curve C is defined parametrically by $x = f(t)$, $y = g(t)$, $a \leq t \leq b$ where f' and g' are continuous but not simultaneously zero on [a, b] and c is traversed exactly once as t increases from a to b then derive the formula for the length of C in the form $L = \int_a^b \sqrt{(f'(t))^2 + (g'(t))^2}\ .\ dt$. 6

4. a) The region bounded by the curve $y = x^2 + 1$ and the line $y = -x + 3$ is revolved about x-axis to generate a solid. Find the volume of the solid generated by Washer's method. 6

   b) Find the volume of the solid generated by revolving the region bounded by $x = y - y^3$ and the y-axis about the x-axis using Shell method. 6

   c) Find the length of the astroid, $y = \sin^3 t$, $x = \cos^3 t$, $0 \leq t \leq 2\pi$. 6

Unit – III

5. a) Prove that a non empty subset H of a group G is a subgroup iff whenever $a \in H$, $b \in H$, $ab^{-1} \in H$. 6

   b) Let H and K be subgroups of a group G. Prove that HK is a subgroup of G if and only if $HK = KH$. 6

   c) Prove that subgroup of a cyclic group is cyclic. 6

6. a) Let H and K be finite subgroups of G such that HK is also a subgroup. Then prove that $O(HK) = \frac{O(H)O(K)}{O(H \cap K)}$. 6

   b) Prove that an infinite cyclic group has exactly 2 generators. 6

   c) Express the following permutation as a product of disjoint cycles and state whether it is odd or even.

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 2 & 3 & 4 & 5 & 7 & 6 & 8 & 1 \end{pmatrix}$$ 6

Unit – IV

7. a) Solve $xydx + (x^2 + y^2)dy = 0$. 6

   b) Solve $(1 + y^2)dx + (x^2y + y)dy = 0$. 6

   c) Solve $(x + 2y - 1)dx - (2x + y - 5)dy = 0$. 6

8. a) Solve $y(x^3 - y)dx - x(x^3 + y)dy = 0$. 6

   b) Solve $dx - (1 + 2x \tan y)dy = 0$. 6

   c) Solve $(2x + 3y - 1)\,dx + (2x + 3y + 2)dy = 0$. 6

Unit – V

9. a) Find the orthogonal trajectories of the family of $r = a \cos 2\theta$. 6

   b) Solve $xp^2 - 3yp + 9x^2 = 0$; for $x > 0$. 6

   c) Solve $y'' = x(y')^3$. 6

10. a) Find the general and singular solution of $2xp^3 - 6yp^2 + x^4 = 0$. 6

    b) Solve the equation $yy'' + (y')^2 + 1 = 0$. 6

    c) A thermometer reading 75°F is taken out where the temperature is 20°F. The reading is 30°F, four minutes later. Find the thermometer reading seven minutes after the thermometer was brought outside. 6

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BSCPHCN 201

Second Semester B.Sc. Degree Examination, September 2022
(NEP 2020) (2021 – 22 Batch Onwards)
PHYSICS (DSCC)
Electricity and Magnetism

Time : 2 Hours Max. Marks : 60

Instructions : *1) Answer questions from* ***all*** *Parts.*
2) Scientific calculators are ***allowed.***

PART – A

Answer **any four** questions. **Each** question carries **2** marks. **(4×2=8)**

1. Mention any two properties of charges.
2. State and explain Gauss' law in electrostatics.
3. What is an electrical insulator ? Give an example.
4. Define time constant in charging a capacitor.
5. What is RC Low Pass Filter ? Draw the circuit diagram.
6. Define divergence of a vector. What is its significance ?

PART – B

Answer **all** questions. **(4×10=40)**

Unit – I

7. a) Derive an expression for the electric field due to a charged spherical conductor at a point outside the sphere. 4

   b) Derive an expression for the electric potential due to a charged spherical conductor at a point (i) outside the sphere, (ii) on the sphere and (iii) inside the sphere. 6

OR

8. a) Define electric field intensity and electric potential. Obtain the relation connecting them. 4

   b) Derive an expression for the electric field due to a charged infinitely long straight conductor. 6

Unit – II

9. a) Explain electric polarization in dipoles. 4

   b) Obtain an expression for the growth of current in a series LR circuit with a steady emf. Define time constant of the circuit. 6

OR

10. a) Explain the effect of electric field on a conductor. 4

    b) Obtain an expression for the charge in a CR circuit during its decay. Define time constant. 6

Unit – III

11. a) Derive an expression for RMS value of AC in terms of peak value. 4

    b) Discuss RC high pass filter and derive an expression for cut off frequency. 6

OR

12. a) Write any four differences between series resonance and parallel resonance. 4

    b) Derive an expression for Hall coefficients and Hall voltage. 6

Unit – IV

13. a) Derive Maxwell's relation $n = \sqrt{\epsilon_r}$. 4

    b) Derive the equation $\vec{\nabla} \times \vec{B} = \mu\left(\sigma\vec{E} + \varepsilon\frac{\delta\vec{E}}{\delta t}\right)$. 6

OR

14. a) State Gauss and Stokes theorem. Express them in vector form. 4

    b) Derive the wave equation for the field vectors $\vec{E}$ and $\vec{B}$. Hence arrive at the equation for the velocity of electromagnetic wave in a medium. 6

PART – C

15. Answer **any three** questions. **Each** question carries **4** marks. **(3×4=12)**

a) Two charges $+4\mu C$ and $-1\mu C$ are kept 1m apart in air. Find the positions along the line joining the charges at which the potential is zero.

b) A parallel plate capacitor has circular plate of radius 4 mm and plates are 0.4 mm apart. Calculate capacitance of the capacitor. Find energy stored in it if a cell of emf 12 V is connected across it.

c) Calculate Hall constant and Hall mobility for sodium. Given atomic weight of sodium is 23. Its density is 970 kg/m^3 and conductivity = $2.1 \times 10^7 ohm^{-1}m^{-1}$.

d) Prove that the vector $\vec{A} = 3y^4z^2\hat{i} + 4x^3z^2\hat{j} - 3x^2y^2\hat{k}$ is solenoidal.

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BSCPHC 153

Credit Based II Semester B.Sc. Examination, December 2021
(2018-19 and Earlier Batches)
PHYSICS
General Physics – II

Time : 3 Hours Max. Marks : 80

Instructions : *1) Answer questions from all **Units.***
*2) Answers to the multiple choice questions should be written in the **first** page of the answer book only.*
*3) Scientific **calculators** are allowed.*

PART – A

1. Answer the following question by choosing the most appropriate answer : **(1×10=10)**

i) The physical quantity that doesnot have the dimensions of force per unit area is
a) Stress b) Pressure c) Strain d) Young's modulus

ii) In actual practice, the value of σ is found to lie between
a) 0.3 and 0.5 b) 0.2 and 0.4 c) 0.4 and 0.5 d) 0.5 and 1

iii) The dimensional formula for coefficient of viscosity is
a) $ML^{-1}T^{-1}$ b) MLT^{-1} c) $ML^{0}T^{-2}$ d) $ML^{2}T^{-1}$

iv) A moving vehicle in which the brakes are applied is an example for
a) Inertial frame b) Non inertial frame
c) Unaccelerated frame d) None of these

v) Fictitious force acts in the upward direction, if an accelerated lift moves in the _____ direction.
a) Horizontal b) Upward
c) Downward d) None of these

vi) In a strong gravitational field, a stationary clock
a) Runs slower b) Runs faster
c) Remains unchanged d) None of these

P.T.O.

vii) Solar spectrum is
   a) Absorption spectrum
   b) Emission spectrum
   c) Continuous spectrum
   d) All of these

viii) Luminosity of a star is
   a) Directly proportional to absolute temperature
   b) Inversely proportional to absolute temperature
   c) Inversely proportional to fourth power of absolute temperature
   d) Directly proportional to fourth power of absolute temperature

ix) Vibration of air column in a resonance tube by excited tuning fork is an example for
   a) Damped vibration
   b) Free vibration
   c) Over damped vibration
   d) Forced vibration

x) What happens to the frequency of a stretched wire when its length and diameter are increased ?
   a) Increases
   b) Decreases
   c) Remains the same
   d) None of these

2. Answer **any five** of the following : **(2×5=10)**
   i) Define Young's modulus. Write the expression for it.
   ii) What is velocity gradient ? How does it vary with the tangential dragging force ?
   iii) Show that the relativistic kinetic energy reduces to classical expression at low speeds.
   iv) What are the characteristics of pseudo force ?
   v) Lower mass star has longer life compared to the higher mass one. Explain.
   vi) Define planck mass and planck length.
   vii) Define quality factor. How does it vary with damping factor ?

PART – B

UNIT – I

3. a) Obtain the expression for rigidity modulus in terms of linear strain (α) and lateral strain (β). 4

   b) Define terminal velocity. State the conditions under which Stoke's law is valid. Arrive at an expression for the terminal velocity from Stoke's law. 6

OR

4. a) Derive the expression for workdone in stretching a wire. 4

   b) What is bending moment of a beam ? Derive the expression for it. 6

5. a) Calculate the Poisson's ratio for the material. 5

   Given $Y = 12.25 \times 10^{10}\ Nm^{-2}$

   $N = 4.55 \times 10^{10}\ Nm^{-2}$.

   OR

   b) A capillary tube 10^{-3}m in diameter and 0.2 m in length is fitted horizontally to a vessel kept full of alcohol of density $0.8 \times 10^{3}\ kgm^{-3}$. The depth of the capillary tube is 0.3 m. Viscosity of alcohol is $0.0012\ NSm^{-2}$. Calculate the volume of alcohol that flows in 5 minutes. 5

UNIT – II

6. a) Obtain the relativistic expression connecting momentum and energy. 4

   b) What is a non-inertial frame of reference ? Derive the expression for the force acting on a particle in a non-inertial frame of reference. 6

   OR

7. a) State and explain Galilean principle of relativity. 4

   b) Using Lorentz transformation equations derive the formula for time dilation and explain relativity of simultaneity. 6

8. a) The length of a spaceship is measured to be exactly half the actual length. Calculate the velocity of the spaceship and the time dilation corresponding to one day on the spaceship. 5

   OR

   b) A spaceship is moving away from the earth with a velocity of 0.7C. It fires a rocket

      a) away from the earth with a velocity 0.8C relative to spaceship

      b) towards the earth with a velocity 0.8C relative to spaceship. What is the velocity of the rocket with respect to earth in both the cases ? 5

UNIT – III

9. a) State and explain Hubble's law with relevant graph. 4

   b) Based on Big-Bang model, explain the evolution of the universe. 6

   OR

10. a) Write a note on white dwarf. 4

b) Explain

i) Luminosity of a star.

ii) Brightness and magnitude of a star

iii) Life time of a star. 6

11. a) The apparent magnitude of a star is 0.09 and absolute magnitude is –0.4. Calculate the distance of the star in light years. 5

OR

b) Life time of Sun is 10 billion years. Calculate the life time of star of 3 solar mass. 5

UNIT – IV

12. a) Discuss the formation of overtones in a rod clamped at one end and set into longitudinal vibrations. 4

b) Derive the expression for velocity of transverse waves in a stretched string. 6

OR

13. a) Write a note on sharpness of resonance in forced vibrations. 4

b) State Fourier's theorem. Explain how Fourier coefficients can be evaluated ? Give any two limitations of Fourier theorem. 6

14. a) Calculate the velocity of sound in carbondioxide at STP. Density of CO_2 at STP is 1.977 kgm^{-3}. The ratio of specific heats is 1.306. What will be the velocity of sound at 30°C ? 5

OR

b) A stretched string vibrates with a frequency of 40 Hz in the fundamental mode when the length of the string is 50cm. The linear density of the string is 1.4×10^{-3} kgm^{-1}. Find the velocity of propagation of transverse wave and tension in the string. 5

Reg. No. | | | | | | | | | |

BSCCHCN 201

Second Semester B.Sc. Degree Examination, September 2022
(NEP 2020) (2021 – 22 Batch Onwards)
CHEMISTRY (DSCC)
Inorganic and Physical Chemistry – I (DSC-2)

Time : 2 Hours

Max. Marks : 60

Instructions : *1) A **single** booklet containing **40** pages will be issued. No additional sheets will be **issued**.*
*2) Write the question number and sub-divisions **clearly**.*
*3) Write equations and diagrams **wherever** necessary.*
*4) Answer Part – **A** in **first two** pages of the answer book.*
*5) Scientific calculators are **allowed**.*

PART – A

Answer **any six** of the following. **(6×2=12)**

1. a) Define orthogonality.

   b) State Pauli's exclusion principle.

   c) Define Modern Periodic law.

   d) Why $HClO_3$ is stronger acid than HClO ?

   e) What is critical phenomenon ?

   f) Define parachor.

   g) State Nernst distribution law.

   h) Define the law of rationality of indices.

P.T.O.

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PART – B

Answer **any four** questions, selecting **one** question from **each** Unit. **Each** question carries **12** marks. **(4×12=48)**

Unit – I

2. a) Calculate effective nuclear charge felt by the last d electron of Mn (At.No. 25). 3
   b) Explain the normalization and orthogonality of a wave function. 4
   c) Explain Bohr's theory of atom. 5

3. a) Derive de Broglie equation. 3
   b) Discuss the radial distribution function for 1s and 2s orbitals. 4
   c) Discuss Aufbau principle and give its limitations. 5

Unit – II

4. a) Explain the structure of P_4O_6. 3
   b) Discuss any two factors responsible for variation of electronegativity. 4
   c) Explain the structure and bonding in diborane. 5

5. a) Discuss Mulliken-Jaffe's electronegativity scale. 3
   b) Explain the preparation and structure of aluminium carbide. 4
   c) What do you mean by Ionisation enthalpy ? How does it change down the group and across the period ? 5

Unit – III

6. a) Calculate RMS, average and most probable velocities of carbon dioxide at 25°C. 3
   b) Give an account of Maxwell's distribution of molecular velocities of gases. 4
   c) Explain the method of determination of surface tension of a liquid. 5

7. a) Describe the effect of temperature and solute on surface tension. 3
   b) Describe working of Abbe's refractometer. 4
   c) Derive expression for critical constants of a gas using van der Waal's equation of state. 5

Unit – IV

8. a) Discuss the applications of liquid crystals. 3

   b) Discuss the modification in Nernst distribution law when association of solute occurs in one of the solvents. 4

   c) Derive Bragg's equation $n\lambda = 2d \sin\theta$ for a crystalline solid. 5

9. a) Write the differences between solid, liquid crystal and liquid. 3

   b) Derive Nernst distribution law thermodynamically. 4

   c) What are Miller indices ? Explain the procedure for determining the Miller indices for a plane. 5

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BSCCHC 181/BSCCHC 153

Choice Based Credit System/Credit Based II Semester B.Sc. Degree Examination, September 2022
(2019-20 Batch Onwards/2018-19 and Earlier Batches)
Paper – II : CHEMISTRY

Time : 3 Hours Max. Marks : 80

Instructions : 1) ***A** single booklet containing **40** pages will be issued. **No** additional sheets will be issued. Write question number and subdivision **clearly**.*

2) *Write the equations and diagram **wherever** necessary.*

3) *Answer Part – **A** in the **first two** pages of the answer book.*

4) *Scientific calculators are **allowed**.*

PART – A

Answer **any ten** of the following : **(2×10=20)**

1. a) What are ionising solvents ? Give example.
   b) What are liquid crystals ? Give example.
   c) Define critical temperature.
   d) Alkali metals are better reducing agents. Why ?
   e) Write any two uses of clathrate compounds.
   f) What are interhalogen compounds ?
   g) Define glass.
   h) Mention any two applications of water gas.
   i) Write the disadvantages of LPG as motor fuel.
   j) What is Kharasch Peroxide effect ?
   k) State Markovnikoff's rule.
   l) How do you convert ethyl propionate into 1-Propanal ?

P.T.O.

PART – B

Answer **any four** of the following choosing **one full** question from **each** unit. **(15×4=60)**

Unit – I

2. a) Explain the complex formation reactions in water and liquid ammonia with suitable example.

   b) Write the structural difference between solid, liquid crystal and liquid. 4

   c) i) Discuss the properties of solution of alkali metals in liquid ammonia. 4

   ii) What is liquid range of a solvent ? Explain with suitable example. 4

3. a) Explain how dielectric constant of a solvent affects solubility. 3

   b) Calculate the root mean square, average and most probable velocities of hydrogen gas molecules at 0°C. 3

   c) i) Explain nematic liquid crystals. 5

   ii) Explain Andrew's P-V isotherms of carbon dioxide . 3

Unit – II

4. a) How do you prepare XeF_2 ? Write its structure and mention the type of hybridisation of Xenon. 4

   b) Explain the structure and reducing property of hydroxylamine. 4

   c) i) Compare the properties of beryllium with those of the other members of the same group. 4

   ii) Discuss the structure of IF_5. 3

5. a) Give the structure of orthophosphoric acid, phosphorus acid and meta phosphoric acid. 3

   b) Discuss the position of hydrogen in the periodic table. 5

   c) i) Discuss the structures of closo and nido boranes. 3

   ii) Explain the structure of $[BeH_2]_n$. 4

Unit – III

6. a) What are the important requirements of optical glass ? 4

   b) Explain the role of gypsum and water in setting of cement. 4

   c) i) Describe the process of manufacture of water gas. 4

      ii) Write a note on safety glass. 3

7. a) Mention different types of feldspar. 3

   b) What is paint ? Write the characteristics of a good paint. 5

   c) i) Write a note on glazing. 3

      ii) Describe the manufacture of lithopone. 4

Unit – IV

8. a) What is Baeyer-Villiger oxidation ? Give its mechanism. 4

   b) Explain the mechanism of addition of hydrogen bromide to 1, 3-Butadiene. 4

   c) i) Explain stereospecificity in electrophilic addition of bromine to alkene. 4

      ii) Give the mechanism of addition of osmium tetroxide to alkenes. 3

9. a) Explain the mechanism of Chichibabin reaction. 3

   b) Write open carbocation mechanism of electrophilic addition of bromine to ethylene. Mention its limitations. 5

   c) i) What is Diel's Alder reaction? Mention its importance. 3

      ii) Give the mechanism for ozonolysis of propylene. 4

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BSCCHC 181/BSCCHC 153

Credit Based/Choice Based Credit System II Semester B.Sc. Degree Examination, December 2021
(2018-19 and Earlier Batches)
CHEMISTRY (Paper – II)

Time : 3 Hours

Max. Marks : 80

Instructions : 1) *Write question number and sub-division* ***clearly.***
2) *Write equation and diagram* ***wherever*** *necessary.*
3) *Answer Part –* ***A*** *in the* ***first two*** *pages of answer book.*
4) ***Scientific*** *calculators are* ***allowed.***

PART – A

1. Answer **any ten** of the following : **(2×10=20)**

a) Define the term (i) collision diameter (ii) collision number.

b) What is an amphiprotic solvent ? Give one example.

c) What are liquid crystals ? Give an example.

d) Arrange the following hydrides in the increasing order of their ionic character.

KH, LiH, CsH, RbH, NaH

e) Fluorine does not show positive oxidation state. Give reason.

f) Give a reaction to show that hydroxylamine is a reducing agent in acid medium.

g) Mention the advantages of liquid propellant over solid propellant.

h) Define calorific value of a fuel.

i) Give one example for plasticizer. Mention its importance in paints.

j) Mention any two synthetic applications of aluminium isopropoxide.

k) What is a stereo specific reaction ? Give an example.

l) Give an example for sarett oxidation.

PART – B

Answer **any four** of the following questions, choosing **one full** question from **each** Unit. (15x4=60)

Unit – I

2. a) Compare any two physical properties of liquid ammonia and water as solvents. 4

   b) Explain the classification of liquid crystals with suitable examples. 4

   c) i) State law of corresponding states and derive reduced equation of state for a gas. 4

   ii) Calculate the root mean square velocity and average velocity of sulphur dioxide molecule at 10°C. 3

3. a) Give an account of Maxwell's distribution of molecular velocities of gases. 3

   b) Derive an expression for critical constants of a gas using Vander Waal's equation. 5

   c) i) Explain complex formation reactions in water and liquid ammonia with suitable examples. 4

   ii) Explain the applications of liquid crystals. 3

Unit – II

4. a) What are silicates ? Explain the different types of silicates. 4

   b) Explain the preparation, properties and structure of $[Be F_4]^{-2}$. 4

   c) i) State Wade's rule and explain the structure of closoboranes. 4

   ii) Compare any three properties of beryllium with those of other members of the same group. 3

5. a) How do you prepare xenon hexafluoride ? Write its structure and hybridisation. 3

   b) Discuss the structure and bonding in diborane. Give chemical evidences for the bridge structure. 5

   c) i) Give an example to show that ionic hydride is a reducing agent. Mention any three applications of ionic hydrides. 4

   ii) What are interhalogen compounds ? Mention the different types of interhalogen compounds with examples. 3

Unit – III

6. a) With neat diagram, explain the manufacture of producer gas. 4

   b) What is RCC ? Explain the role of gypsum and water during setting of cement. 4

   c) i) Describe the manufacture of glass by tank furnace method. 4

   ii) Give the classification of refractories with examples. 3

7. a) Explain the manufacture of calcium ammonium nitrate. 3

   b) Describe the different steps involved in the production of cane sugar. 5

   c) i) Explain the classification of secondary explosives with suitable examples. 4

   ii) Mention the applications of super conductors. 3

Unit – IV

8. a) Explain the mechanism of electrophilic addition of hydrogen bromide to 1,3-butadiene. 4

   b) Describe Diels-Alder reaction. Mention its importance. 4

   c) i) Explain the mechanism of ozonolysis of propene. 4

   ii) What is Baeyer-Villiger oxidation ? Give one example. 3

9. a) How do you convert carbonyl compounds into hydro carbons using hydrazine ? Name the reaction. 3

   b) What is Dakin reaction ? How do you convert salicylaldehyde into catechol ? Give the mechanism of the reaction. 5

   c) i) Explain one example each for chichibabin reaction and Etard reaction. 4

   ii) Explain open carbocation mechanism of electrophilic addition of bromine to ethene. 3

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BSCCHC 153

Credit Based II Semester B.Sc. Degree Special Examination, December 2020
(Choice Based Credit Scheme)
(Common to All Batches) (Repeaters)
CHEMISTRY (Paper – II)

Time : 3 Hours

Max. Marks : 80

Instructions : *1) Write question number and sub-division* ***clearly.***
2) Write equation and diagram ***wherever*** *necessary.*
*3) Answer Part – **A** in the* ***first two*** *pages of the answer book.*
4) Scientific calculators are ***allowed.***

PART – A

1. Answer **any ten** of the following : **(2×10=20)**

a) Define collision number. Write its mathematical expression.

b) What is an ammono acid ? Give one example.

c) What are liquid crystals ? Give an example.

d) Potassium hydroxide is a stronger base than calcium hydroxide. Give reason.

e) Calculate the styx number of $B_6H_6^{-2}$.

f) Write the structure of xenon difluoride and mention the type of hybridisation.

g) Mention the composition of dynamite.

h) How is calcium cyanamide prepared ?

i) Give any two properties of flint glass.

j) What is a pericyclic reaction ?

k) How do you convert ethyl propanoate into propanol ?

l) Give any two synthetic applications of sodium borohydride.

P.T.O.

PART – B

Answer **any four** of the following questions, choosing **one full** question from **each** Unit. **(15×4=60)**

UNIT – I

2. a) Explain Maxwell's distribution of molecular velocities of gases. 4

   b) Write a note on levelling effect of solvents. 4

   c) i) Explain the classification of liquid crystals with examples. 4

   ii) At what temperature the root mean square velocity of methane will be 684.1 m/s. 3

3. a) Explain the applications of liquid crystals. 3

   b) Derive an expression for critical constants of a gas using Vander Waal's equation. 5

   c) i) Explain the classification of solvents with examples. 4

   ii) What is liquid range of a solvent ? Explain with suitable examples. 3

UNIT – II

4. a) State Wade's rule. Discuss the structure of Nidoboranes. 4

   b) Compare the properties of beryllium with those of the other member of the same group. 4

   c) i) Explain the preparation, structure and hybridisation of Xenon trioxide. 4

   ii) What are inter halogen compounds ? Give different types with examples. 3

5. a) Explain the preparation and properties of ionic hydride. 3

   b) Discuss the structure and bonding in diborane. Give chemical evidences for the bridge structure. 5

   c) i) Explain the preparation, properties and structure of $[BeF_4]^{-2}$. 4

   ii) Give the structure of meta phosphoric acid and pyro phosphoric acid. 3

UNIT – III

6. a) Explain the manufacture of water gas. 4

   b) Describe the different stages of manufacture of paper. 4

   c) i) What are the uses of binders, thinner, driers and fillers in paints ? 4

   ii) Explain the chemical reactions taking place during firing of ceramic articles. 3

7. a) What is setting of cement ? Write the chemical reactions taking place during setting of cement in first 24 hours. 3

   b) Outline the different steps involved in the production of cane sugar. 5

   c) i) Describe the manufacture of glass by tank furnace method. 4

   ii) What are the general characteristics of refractories ? 3

UNIT – IV

8. a) Give one example each for Chichibabin reaction and Meerwein-Ponndorf-Verly reduction. 4

   b) Explain the mechanism of electrophilic addition of hydrogen bromide to propene. 4

   c) i) Give the mechanism of allylic bromination of alkenes using N-bromosuccinimide. 4

   ii) Explain stereo specificity in electrophilic addition of bromine to butene – 2. 3

9. a) Explain open carbocation mechanism of electrophilic addition of bromine to ethene. 3

   b) Give the mechanism of oxidation of alkenes using dilute solution of potassium permanganate in alkaline medium. 5

   c) i) Explain Diels-Alder reaction. Mention its importance. 4

   ii) What is Dakin reaction ? How do you convert salicylaldehyde into catechol. 3

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BSCZOCN 201

II Semester B.Sc. Degree Examination, September 2022
ZOOLOGY
Biochemistry and Physiology (DSCC)
(NEP – 2020) (2021-22 Batch Onwards)

Time : 2 Hours Max. Marks : 60

Instruction : *Draw diagrams* ***wherever*** *necessary.*

PART – A

I. Answer **any six** questions from following questions : **(6×2=12)**

a) What are disaccharides ? Give two examples.

b) Write the equation of Michaelis-Menton.

c) Name any four enzymes of citric acid cycle.

d) What are peptide linkages ?

e) Define inspiratory capacity and expiratory capacity.

f) Define cardiac output.

g) Name any four hormones secreted by anterior pituitary gland.

h) What is a motor unit ?

PART – B
Unit – I

II. Answer **any two** of the following : **(2×3=6)**

a) Write a note on isozymes.

b) What are steroids and phospholipids ? Give example.

c) Write any three biological importances of carbohydrates.

III. Answer **any one** of the following : **(1×6=6)**

a) Explain the general properties of amino acids.

b) Give an account of classification of enzymes.

P.T.O.

Unit – II

IV. Answer **any two** of the following : **(2×3=6)**

a) Enumerate any three enzymes involved in the biosynthesis of palmitic acid.

b) Explain briefly transamination.

c) Write a short note on ketogenesis.

V. Answer **any one** of the following : **(1×6=6)**

a) With schematic representation, explain urea cycle.

b) Give the schematic representation of glycolysis.

Unit – III

VI. Answer **any two** of the following : **(2×3=6)**

a) Explain briefly digestion of fat in humans.

b) Explain counter current multiplier system.

c) Write a note on ABO blood group.

VII. Answer **any one** of the following : **(1×6=6)**

a) Define oxygen dissociation curve. Explain with suitable illustration. Add a note on factors affecting it.

b) Draw a neat labelled diagram of V.S. of mammalian heart.

Unit – IV

VIII. Answer **any two** of the following : **(2×3=6)**

a) Write a short note on smooth muscles.

b) What is action potential ? Explain.

c) Name adrenal medullary hormones. Write their functions.

IX. Answer **any one** of the following : **(1×6=6)**

a) Explain briefly the mechanism of hormone action.

b) With the aid of neat labelled diagram, explain the ultrastructure of a striated muscle.