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Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme Under CBCSS

History

Core Course VI

HY 1541 – MAJOR TRENDS IN HISTORICAL THOUGHT AND WRITINGS

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in one sentence or two each. Each question carries **1** mark.

1. Historical memoir.
2. Xenophone.
3. *The city of God.*
4. Szuma-Chien.
5. Descartes.
6. Hegel.
7. *A Book on General View of Positivism.*

P.T.O.

8. Scientific History.

9. Ferdinanad de Saussure.

10. March Bloch.

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** of the following in one paragraph. Each carries **2** marks.

11. Explain the features of Greek Historiography.

12. Write a note on the contributions of Tacitus to Roman Historiography.

13. Write a note on the origin of Annals historiography.

14. Contributions of Ranajith Guha to the development of Subaltern Studies.

15. Write a note on the Salient features of Chinese Historiography.

16. Explain the Cyclical View of the History.

17. Discuss the characteristics of Christian historiography.

18. Discuss the five causes to the growth of Christianity before Constantine, according to Gibbon.

19. Explain the idea of Universal History.

20. Discuss the belief of divine Providence of Vico.

21. Write a note on Positivism.

22. Livy.

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Answer **any six** of the following in not more than 120 words. Each carries **4** marks.

23. Analyse the French historical Revolution.

24. Discuss Anti-Carticianism.

25. Analyse the Theory of class war of Karl Marx.

26. Examine the salient features of structuralism.

27. Discuss the contributions of Ranke towards historical objectivity.

28. Examine the role of Antonio Gramci in the development of Subaltern studies.

29. Make an analysis on the contributions of Michel Foucault to historiography.

30. Discuss post modernism.

31. Write a note on the historiography of Pre-classical times in Greece.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** of the following. Each question carries **15** marks.

32. Critically analyze the contributions of Karl Marx to historiography.

33. Make a brief analysis of characteristics of Greeco-Roman Historiography.

34. How can structuralism be applicable in historical writing and analysis? Explain.

35. Assess the contributions of medieval historians to the development of historiography.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme under CBCSS

History

Core Course VII

HY 1542 : COLONIALISM AND RESISTANCE MOVEMENTS IN INDIA

(2014 Admission Onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in one sentence or two each. Each carrying **1** mark :

1. Dual Government
2. Robert Clive
3. Cornwallis
4. Battle of Plassey
5. Kattabhomman
6. Female infanticide
7. Treaty of Sreerangapattanam
8. Subsidiary Alliance
9. Bahadur Shah II
10. Queen Victoria's proclamation of 1858

(10× 1 = 10 Marks)

P.T.O.

PART – B

Answer any **eight** of the following in one paragraph each. Each question carries **2** marks.

11. Warren Hastings
12. Charter Act of 1813
13. Brahma Samaj
14. Explain the meaning of Industrial Capitalism
15. Discuss the significance of Carnatic wars
16. Ryotwari system
17. Doctrine of Lapse
18. Anglo-Maratha wars
19. Kundara proclamation
20. Santhal rebellion
21. Pitts India Act
22. Nawabs of Bengal

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Answer any **six** of the following in not more than **120** words. Each question carries **4** mark.

23. Write a note on the formation of East India Company
24. What are the reasons for the Pazhassis revolt against the British?
25. Analyse Robert Clive's service to consolidate East India Company's Power in India

26. Write a note on Macaulay's education mission

27. Write a note on the contribution of the British in abolition of Slavery

28. What were the consequences of the revolt of 1857?

29. The role of Christian Missionaries in the development of vernacular education in India.

30. Briefly describe the economic impact of colonial rule in India.

31. Describe the role of Vellore Mutiny in the history of liberation struggle.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** of the following as Long Essay. Each question carries **15** marks.

32. Describe the British Commercial expansion in India?

33. Discuss the early attempts of socio-religious reform movements in India

34. Discuss the drain of India's wealth to Britain from the period beginning with the British rule in India.

35. What are the factors and reasons behind the Revolt of 1857?

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme under CBCSS

History

Core Course IX

HY 1544: HISTORY OF PRE-MODERN KERALA

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in one sentences or two each. Each question carries **1** mark.

1. Ur.
2. Ashtanga Hridaya.
3. Sanketham.
4. Sree Mmulavasam.
5. Sankaranarayaneeyam.
6. Tolkappiyam.
7. Koodiyattam.

P.T.O.

8. Noottuvar.

9. Salais.

10. Ankam.

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** of the following in one paragraph each. Each question carries **2** marks.

11. Pathittupattu.

12. Muziris.

13. Jewish copper plate.

14. Anchuvannam.

15. Alwars and Nayanars.

16. Sakthan Thampuran.

17. Thunchath Ezhuthachan.

18. Marumakkathayam.

19. Horthus Malabaricus.

20. Mannappedi Pulappedi.

21. Sankaracharya.

22. Koothu.

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Answer **any six** of the following in not more than 120 words each. Each question carries **4** marks.

23. Onam as a festival of Kerala. Comment.

24. Assess the impact of Portuguese contact on Kerala society and culture.

25. Point out the relevance of Manipravalam literature as a historical source.

26. Give an account of the Brahmin migration to and settlements in Kerala.

27. Throw light on the emergence and growth of new trading centres Medieval Kerala.

28. Give a brief description on the prehistoric period of Kerala.

29. Account on the proliferation of caste system in medieval Kerala.

30. Describe the formation of Nadus and swaroopams in medieval Kerala.

31. Elucidate the cultural contribution of the Zamorins of Calicut.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** of the following. Each question carries **15** marks.

32. Discuss the influence of Geography on the evolution of the history and culture of Kerala.

33. Analyse the role of temple in medieval Kerala.

34. To what extent Marthanda varma can be considered as the maker of Modern Travancore.

35. Examine the Tamil Sanskrit and Malayalam literary sources that help in the reconstruction of Kerala History.

(2 × 15 = 30 Marks)

St. Xavier's College

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Name : .....

Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme under CBCSS

History

Core Course X

HY 1545 – MAKING OF INDIAN NATION

(2014 Admission onwards)

St Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in **one** or **two** sentences each. **Each** question carries **1** mark.

1. Bhagat Singh
2. Lucknow Pact
3. Ali Brothers
4. Kakori Train robbery
5. Ghadar party
6. Kalpana Dutta
7. Kheda Satyagraha

P.T.O.

8. Chauri Chaura incident

9. Irwin's delcaration

10. Wavell plan

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** of the following in one paragraph each. **Each** question carries **2** marks.

11. Bina Das

12. Poorna Swaraj resolution

13. Tebhaga Struggle

14. Poona pact

15. Moderates

16. Partion of Bengal

17. Round table conference

18. Harijan Sevak Sangh

19. Nehru report

20. Bardoli Sathyagraha

21. RIN mutiny

22. A.O.Hume

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Answer **any six** of the following in not more than 120 words each. **Each** question carries **4** marks.

23. Examine the impact of partition of India.

24. Critically examine the Khilafat agitation in India and its effects.

25. Describe the role if INA in India's freedom movement.

26. Mention the impact of First World War on Indian freedom struggle.

27. Critically examine the provisions of the Mount batten Plan.

28. Discuss the significance of Civil Disobedience movement in the anti-colonial Struggle.

29. Discuss the factors which led to the growth of communalism in British India.

30. Examine the economic impact of British rule in India.

31. Point out the historical significance of Quit India movement.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** of the following. **Each** question carries **15** marks.

32. Assess the role of Mahatma Gandhi in the Indian National movement.

33. Compare and contrast the policies and programmes of the Moderates and The Extremists.

34. Critically examine the government of India Act, 1935.

35. Examine the causative factors that led to the rise of Indian National awakening

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

History

Open Course I

HY 1551.2 – INTRODUCTION TO ARCHAEOLOGY

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

(Answer **all** questions in **one** sentence or **two** each. Each carries **1** mark)

1. Archaeology as a discipline
2. Assemblage
3. Aerial Archaeology
4. Archaeological culture
5. Salvage archaeology
6. Neolithic
7. Pollen analysis
8. Trench excavation

P.T.O.

9. Social Archaeology.

10. Archaeological site.

(10 × 1 = 10 Marks)

PART – B

(Answer **any eight** in one paragraph. Each carries **2** marks)

11. Underwater archaeology.

12. Highlight the salient features of Neolithic cultures in India.

13. Comment on the importance of archaeology.

14. Define Historical Archaeology

15. Discuss important methods of excavations.

16. Discuss the C14 and Thermo Luminiscence dating techniques.

17. What is Ethno Archaeology?

18. Elucidate the classification in Palaeolithic period.

19. Write a short note on Aerial Archaeology.

20. Describe the relation between Archaeology and Geography.

21. Absolute dating.

22. Cultural Evolution.

(8 × 2 = 16 Marks)

PART – C

(Answer **any six** questions in not more than **120** words. Each carries **4** marks)

23. What is environmental Archaeology?

24. Analyse the interdisciplinary approaches in Archaeology.

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25. Write a note on Importance of Museums.

26. Assess the contributions of Alexander Cunningham in Indian Archaeology.

27. Comment on the different types of archaeological dating.

28. What do you mean by geological time scale.

29. Bring out the significance of Radio Carbon methods.

30. Discuss the functions of ASI.

31. What is culture? What do you mean by cultural evolution?

(6 × 4 = 24 Marks)

PART – D

(Answer any **two** essay questions. **Each** question carries **15** marks)

32. Discuss scope and concepts of archaeology.

33. What do you mean by dating? Highlight the important dating techniques.

34. Make an assessment of the development of archaeology in India.

35. Discuss the general characteristics of Palaeolithic and Neolithic cultures in India.

(2 × 15 = 30 Marks)

St. Xavier's College

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Name : .....

Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme Under CBCSS

Economics

EC 1542 : MACRO ECONOMICS – II

(2014 Admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

Answer **all** questions. Each question carries 1 mark.

1. Average Propensity to Consume
2. Induced investment
3. Stagflation
4. Deflation
5. Real interest rate
6. Fisher Effect
7. Macroeconomics
8. Cash Reserve Ratio
9. Consumer Price Index (CPI)
10. Financial investment

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

Answer **any eight** questions not exceeding one paragraph. Each question carries **2** marks.

11. What is high powered money?

12. Define Endogenous variable.

13. How can you explain economic variable?

14. Write a note on Absolute Income Hypothesis.

15. Discuss briefly the Pigou effect.

16. Define Depression.

17. What do you mean by monetary policy?

18. Write a note on the role of Reserve Bank of India.

19. What do you mean by Gross investment?

20. Explain Relative Income hypothesis.

21. Define effective demand.

22. How can you explain natural rate of unemployment?

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – III

Answer **any six** questions not exceeding 120 words. Each question carries **4** marks.

23. What are the major qualitative credit control techniques adopted by Central Bank?

24. Explain the liquidity trap.

25. Explain Phillips Curve.

26. Discuss the Liquidity Preference Theory of Interest popularized by J.M. Keynes.

27. Write a note on Trade Cycle.

28. Elucidate the Milton Friedman's Restatement of quantity theory of money.

29. What are the major types of inflation?

30. Explain the concepts of real interest rate and nominal interest rate.

31. Define the concept of money supply. What are the different types of money supply?

(6 × 4 = 24 Marks)

SECTION – IV

Answer **any two** questions, not exceeding four pages. Each question carries **15** marks.

32. Explain the major monetary and fiscal policies for controlling inflation.

33. Explain the concepts of investment multiplier and accelerator.

34. Discuss elaborately the Relative Income Hypothesis and Life Cycle Hypothesis.

35. Explain the objectives and techniques of macroeconomic policies initiated by Central Government and the Reserve Bank of India.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A/B.Sc./B.Com Degree Examination, December 2019

First Degree Programme under CBCSS

Physical Education

Open Course

PE 1551 HEALTH AND FITNESS EDUCATION

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions. Each question carries **1** mark.

1. List the dimensions of Health.
2. Define Physical Education.
3. What is tidal volume?
4. Ranji Trophy is associated with which game?
5. List any five components of Performance related fitness.
6. What is malnutrition?
7. Olympic games are held after how many years?
8. What is a fracture?
9. What is cool down?
10. Write the formulae for calculating BMI.

(10 × 1 = 10 Marks)

P.T.O.

PART – B

Answer **any eight.** Each question carries **2** marks.

11. List the principles of first aid.

12. Write the first aid measures for sprain.

13. What is second wind?

14. What is HR max? What is the commonly used formulae to compute it?

15. Write a short note on Olympics Games.

16. How do hereditary factors effect health?

17. Brief the causes for hypertension.

18. What is cardio respiratory endurance? How can it be improved?

19. Write the remedial measures for Lordosis.

20. What is environmental hygiene? How it can be maintained?

21. Write a short note on body composition.

22. What is the social dimension of health?

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Answer any **six.** Each question carries **4** marks.

23. Describe the physical dimension of health.

24. Briefly describe the effect of smoking and chewing Tobacco on health?

25. What is balanced diet? Brief about the important nutrients.

26. What is computer addiction? How does it harm?

27. What is the significance of Cool down in sports training?

28. What is posture? Why it is important?

29. What is performance related fitness? Define any four of its components.

30. Write the first aid measures to be followed in case of electric shock.

31. What is obesity and its common causes.

(6 × 4 = 24 Marks)

PART – D

Answer any **two.** Each question carries **15** marks.

32. Throw light on respiratory system. Discuss the effect of exercise on Respiratory system.

33. What is the aim and objectives of physical education? Describe the significance of physical education in the present scenario.

34. What are the various hypokinetic diseases? Write the management of these diseases.

35. What are sport injuries? Enumerate common sport injuries and its management.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme Under CBCSS

Economics

Core Course VI

EC 1541 : MONEY AND MODERN BANKING

(2015 Admission Onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

I. Answer **all** questions. Answer in one or two sentences

1. Money
2. High powered money
3. Cheque
4. NPA
5. Debit card
6. Central Bank
7. CRR
8. ATM
9. Barter system
10. Gold standard

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

II. Answer **any eight** questions not exceeding one paragraph. Each question carries **2** marks.

11. What is the classical approach towards demand for money?

12. What is money multiplier?

13. What is the significance of balance sheet of a bank?

14. What are the difference between promissory note and bill of exchange?

15. Write a note on mobile banking.

16. What are the importance of cooperative credit societies in India?

17. What are the determinants of money supply?

18. What are the different types of bank accounts?

19. Review REI as Banker's Bank.

20. What are the difference between NEFT and RTGS?

21. Write a note on Securities and Exchange Board of India (SEBI).

22. State Quantity theory of money.

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – III

III. Answer **any six** of the following. Each answer should not exceed 120 words. Each question carries **4** marks

23. What are the objectives of monetary policy of RBI.

24. What are the electronic services available to the customers from the banks?

25. Examine the process of credit creation of banks?

26. Examine the significance of Sarfaesi act implemented in India.

27. What are the functions of money as a medium of transactions?

28. What are the different kinds of money available in India?

29. Write a note on Indian currency system.

30. Critically examine the banking sector reforms in India.

31. Narrate the history of commercial banks in India.

(6 × 4 = 24 Marks)

SECTION – IV

IV. Answer **any two** questions not exceeding 4 pages each. Each question carries **15** marks

32. Critically examine the functions of Reserve Bank of India?

33. What are the functions of commercial banks?

34. What are the different theoretical approaches towards demand for money?

35. Examine the recent innovations in Indian banking industry?

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme Under CBCSS

Economics

Core Course VII

EC 1542 – MACRO ECONOMICS II

(2015 Admission Onwards)

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in one word to maximum of two sentences. Each question carries **1** mark.

1. Psychological law of consumption function
2. Permanent income
3. Ratchet effect
4. Inventory investment
5. Money illusion
6. Fisher effect
7. Inflationary gap

St. Xavier's College

P.T.O.

8. Net present value

9. Marginal propensity to consume

10. Crowding out effect

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** questions not exceeding one paragraph. Each question carries **2** marks.

St. Xavier's College

11. Write a note on objective factors influencing consumption.

12. What is marginal efficiency of capital? Explain its determinants.

13. Keynes effect

14. What is Liquidity trap?

15. Explain the accelerator theory of investment.

16. Explain the H theory of money supply.

17. What are the instruments of fiscal policy?

18. Explain Kuznet's consumption puzzle.

19. What are the RBI measures of money supply?

20. What are the basic functions of money?

21. Is monetary policy effective in the situation of liquidity trap?

22. State the quantity theory of money.

(8 × 2 = 16 Marks)

PART – C

Answer **any six** questions not exceeding 120 words. Each question carries **4** marks.

23. Describe briefly the absolute income hypothesis. What are the main propositions of this hypothesis?

24. Explain briefly the concept of money multiplier.

25. Dampeners on accelerator.

26. Describe the demand-pull inflation.

27. State important propositions of monetarism.

28. Explain inflation and its causes. How do economists classify inflation?

29. Geometrically derive the IS curve.

30. Describe various anti-inflationary measures.

31. How does the Phillips curve explain the trade off between unemployment and inflation?

(6 × 4 = 24 Marks)

PART – D

Answer **any two** questions not exceeding four pages. Each question carries **15** marks.

32. Give the central idea of Hawtrey's trade cycle theory.

33. How does Relative Income Hypothesis explain consumption behaviour of households?

34. Explain the objectives and instruments of monetary policy.

35. Critically evaluate Keynesian liquidity preference theory of demand for money.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme under CBCSS

Economics

Core Course IX

EC 1544 : INDIAN ECONOMY

(2015 Admission Onwards)

Time : 3 Hours Max. Marks : 80

St. Xavier's College

PART – I

(Answer in **one** or **two** sentences attempt **all** questions)

1. Demographic dividend
2. Density of population
3. Globalisation
4. Evergreen revolution
5. MSMEs
6. Human Poverty
7. Labour force participation

P.T.O.

8. Sustainable development

9. Product market

10. Social infrastructure.

(10 × 1 = 10 Marks)

PART – II

(Answer **any eight** questions not to exceed one paragraph. Each questions carries **2** marks.)

11. What is Inclusive development?

12. Explain the institutional reforms in agriculture.

13. Point out the objectives of industrial policy resolution of 1991.

14. What is Green revolution?

15. Point out the strategic role of PSUs.

16. Explain the concepts of LPG.

17. Explain the importance of MUDRA.

18. Write a short note on NITI Aayog.

19. Critically explain the impact of WTO on Indian agriculture.

20. What are important causes of Poverty and Inequality in India?

21. What are the reasons for shifting Cropping pattern in India?

22. Explain the extent and magnitude of Unemployment in India.

(8 × 2 = 16 Marks)

St Xavier's College

PART – III

(Answer **any six** questions, not exceeding 120 words. Each questions carries **4** marks.)

23. Briefly explain the performance of agriculture during the pre-reform and post reform period.

24. Analyse the rate and pattern of industrial growth during the last two decades of liberal economic policy regime.

25. Discuss recent fiscal and financial reforms in India in detail.

26. Write a note on Demographic characteristics of India.

27. Explain salient features of Census 2011.

28. Is Universal Basic Income (UBI) a correct way to attain inclusive growth? Comment it.

29. Explain the challenges of Urbanisation in India.

30. Explain the role and performance of service sector in Indian economy.

31. Write a short note on New Agricultural Policy 2000.

(6 × 4 = 24 Marks)

St. Xavier's College

PART – IV

(Answer **any two** questions, not exceeding four pages. Each questions carries **15** marks.)

32. Critically evaluate the Indian planning process and sketch an overview of five year plans in India.

33. What are the highlights of National Population Policy 2000?

34. What are the reasons for introducing Economic reforms 1991 and explain in detail the Second Generation of Economic reforms.

35. Explain the role of MSMEs in Indian Economy.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.A. Degree Examination, December 2019

First Degree Programme under CBCSS

Economics

Core Course X

EC 1545 – PUBLIC ECONOMICS

(2015 Admission Onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

Answer in **one or two** sentences. Attempt **all** questions

1. Social good
2. VAT
3. Laffer curve
4. Forfeitures
5. Redeemable and Irredeemable debt
6. Programme Budgeting
7. Advalorem tax
8. Compensatory fiscal policy
9. Deficit financing
10. Indirect tax

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

Answer **any eight** questions not exceeding **one** paragraph. Each question carries **2** marks.

11. Explain the principles of taxation.

12. What are the difference between public finance and private finance?

13. Write a note on market failure and externalities.

14. What are the canons of public expenditure

15. Describe the sources of non-tax revenue.

16. Distinguish between vertical and horizontal imbalance.

17. What are the merits and demerits of VAT?

18. Write a note on zero based budget.

19. Distinguish between impact and incidence of a tax.

20. Explain the difference between tax avoidance and tax evasion.

21. Describe the advantages of capital levy.

22. What are the principles of public debt management?

(8 × 2 = 16 Marks)

SECTION – III

Answer **any six** questions not exceeding **one** paragraph. Each question carries **4** marks.

23. Distinguish between Classical and Keynesian approaches to fiscal policy.

24. What are the economic effects of deficit financing?

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25. Explain the ways of government intervention to correct negative externalities.

26. Describe the features of Peacock and Wiseman Hypothesis.

27. Give an account of the effect of public expenditure on production, consumption and distribution.

28. Critically examine the principle of maximum social advantage.

29. Explain Centre-State financial relations in India.

30. Briefly explain the various revenue sources of Local government in India.

31. Describe the reasons for growing public expenditure in India.

(6 × 4 = 24 Marks

St. Xavier's College

SECTION – IV

Answer **any two** questions not exceeding **four** pages. Each question carries **15** marks.

32. What is meant by a tax? Describe the various classification of taxes.

33. Give an account of the role of the 15th finance commission of India and analyze the fiscal imbalances between Central and State Governments in India.

34. Distinguish between impact, incidence and shifting of taxation. Explain Musgrave's theory of incidence of taxation.

35. Explain meaning and scope of Public economics and how to evaluate the changing role of government in a modern economy.

(2 × 15 = 30 Marks)

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Reg. No. : .....

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Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2019

First Degree Programme Under CBCSS

Economics

Open Course

EC 1551 : HUMAN RESOURCE MANAGEMENT

(2015 Admission Onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

I. Answer **all** questions. Answer in **one** or **two** sentences.

1. HR Management
2. Human capital
3. Recruitment
4. Demotion
5. Labor theory of value
6. Industrial democracy
7. Job enrichment
8. Define 'on the job training'

P.T.O.

9. Selection

10. Employee motivation

(10 × 1 = 10 Marks)

SECTION – II

II. Answer any **eight** questions **not** to exceed one paragraph. **Each** question carries **2** marks.

11. What is job analysis?

12. What are the different methods of recruitment?

13. Career planning.

14. What is meant by job description?

15. What are the objectives of training?

16. What is meant by 360 degree appraisal?

17. Performance appraisal.

18. Difference between layoff and retrenchment.

19. What are the objectives of industrial democracy?

20. Write a note on WPM.

21. Succession planning of a company.

22. What do you mean by Induction Training?

(8 × 2 = 16 Marks)

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SECTION – III

III. Answer any **six** of the following. Each answer should not exceed **120** words. **Each** question carries **4** marks.

23. Difference between HRD and HRM.

24. 'India's development rest upon manpower planning'. Discuss.

25. Differentiate recruitment and selection

26. Explain the trends in India's working age population.

27. What are the reasons for transfer of workers?

28. Explain about the collective bargaining.

29. Examine the power and responsibilities of an HR manager in an organization.

30. Examine about different methods of promotion. List out the advantages of merit based promotion.

31. Liberalization and Privatization weakens trade union movement in India. Discuss.

(6 × 4 = 24 Marks)

SECTION – IV

IV. Answer any **two** questions not exceeding **4** pages each. **Each** question carries **15** marks.

32. Role of HRM in the emerging economic environment with special reference to India.

33. Define training and what are the benefits of training to the employees of company. What are the different methods of training?

34. What are the functions of HRM and how it could be differentiated from personnel management?

35. Discuss about the meaning of discipline and what are the procedures for disciplinary action.

(2 × 15 = 30 Marks)

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Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

Mathematics

Open Course

MM 1551.1 : OPERATIONS RESEARCH

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** the **ten** are compulsory. They carry 1 mark each.

1. Write standard form of a Linear programming Problem.
2. Define a feasible solution to an a Linear programming Problem.
3. Define a basic variable in a Linear programming Problem.
4. Name any two methods to solve a Linear programming Problem.
5. Define a transportation problem.
6. If a standard transportation problem has $(m+n)$ constraints, then find the number of positive value variables?
7. Which is the superior method to find the initial solution of a transportation problem?

P.T.O.

8. If the cost of doing any job on machine 1 is reduced by k, then what will be the change in the objective function of the assignment problem?

9. Which methods are used for project management?

10. Who is the inventor of CPM?

PART – B

Answer **any eight** questions from this section. Each question caries **2** marks.

11. Mark the feasible region of the Linear programming Problem

Maximize $50x + 18y$

Subject to

$2x + y \leq 10$
$x + y \leq 8$
$x \geq 0, y \geq 0.$

12. Which are the main features of a Linear programming Problem in standard form?

13. Reduce the following Linear programming Problem in standard form

Maximize $Z = x_1 - 2x_2 + 3x_3$

Subject to

$x_1 + x_2 + x_3 \leq 7$
$x_1 - x_2 + x_3 \geq 2$
$3x_1 - x_2 - 2x_3 = -5$
$x_1, x_2 \geq 0,\ x_3$ unrestricted in sign

14. What is a transportation Problem?

15. Write the standard form of a transportation problem when total demand exceeds total supply?

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16. Furnish the transportation table for the following transportation problem with three ware houses and four markets.

The ware house capacities are $a_1 = 250$, $a_2 = 300$ and $a_3 = 400$. The market demands are $b_1 = 200$, $b_2 = 225$, $b_3 = 275$ and $b_4 = 250$. The unit cost of shipping is giving by the following table :

	M_1	M_2	M_3	M_4
W_1	11	13	17	14
W_2	16	18	14	10
W_3	21	24	13	10

17. What is an assignment problem?

18. What is the condition for solving an assignment problem by Hungarian method?

19. Write the transportation matrix of a standard assignment problem with *n* Jobs and *n* Machines.

20. Define an event in network problem.

21. If the optimistic time of a job is 5, most probable time is 14 and pessimistic time is 17, then find standard deviation?

22. Write a short note on project management.

PART – C

Answer **any six** questions from this section. Each question carries **4** marks

23. Solve graphically

Maximize $Z = 50x_1 + 18x_2$

Subject to the constraints

$2x_1 + x_2 \leq 100$

$x_1 + x_2 \leq 80$

$x_1 \geq 0, x_2 \geq 0$

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24. Use simplex method to solve

Maximize $Z = 2x_1 + 3x_2$

Subject to the constraints

$x_1 + x_2 \leq 1$

$3x_1 + x_2 \leq 40$

$x_1, x_2 \geq 0.$

25. A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below :

Machine	Time per unit (minutes)			Machine capacity (minutes/day)
	Product 1	Product 2	Product 3	
M_1	2	3	2	440
M_2	4	-	3	470
M_3	2	5	-	430

It is required to determine the daily number of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is Rs. 4, Rs. 3 and Rs. 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the Linear programming Problem that will maximize the daily profit.

26. Explain a model of a transportation problem.

27. Solve the following transportation problem with North West Corner Rule.

	M_1	M_2	M_3	Supplies
W_1	5	8	4	50
W_2	6	6	3	40
W_3	3	9	6	60
Demand	20	95	35	

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28. Find the optimal assignment of three jobs and three machines when the cost of assignment is given by the following table.

	J_1	J_2	J_3
M_1	8	5	6
M_2	7	7	8
M_3	6	8	7

29. Solve the following cost matrix of an assignment problem ; where J_1, J_2, J_3 are jobs and M_1, M_2 and M_3 are machines.

	J_1	J_2	J_3
M_1	250	400	350
M_2	400	600	350
M_3	200	400	250

30. Draw a Network for the following activities in a project.

Active	Predecessor Activity
A	–
B	A
C	A
D	B
E	B, C

31. Find the average time and standard deviation of the following activities.

Activity	Time estimates in weeks		
	Optimistic	Most likely	Pessimistic
A	5	8	11
B	3	6	9

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PART – D

Answer **any two** questions from this section. Each question caries **15** marks

32. Solve

Maximize $Z = x_1 + x_2 + x_3$

Subject to

$x_1 + 2x_2 + 3x_3 \leq 1$
$3x_1 + x_2 + 3x_3 \leq 1$
$2x_1 + 3x_2 + x_3 \leq 1$
$x_1, x_2, x_3 \geq 0$

33. Find an initial basic feasible solution to the transportation problem using the North-west corner rule.

	M_1	M_2	M_3	M_4	Supplies
W_1	3	5	7	6	50
W_2	2	5	8	2	75
W_3	3	6	9	2	25
Demand	20	20	50	60	

34. Find the optimal assignment of four jobs and four machines when the cost of assignment is given by the following table.

	J_1	J_2	J_3	J_4
M_1	10	9	8	7
M_2	3	4	5	6
M_3	2	1	1	2
M_4	4	3	5	6

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35. An architect has been awarded a contract to prepare a plans for an urban renewal project. The job consists of the following activities and estimated times.

Activity	Duration (Weeks)	Predecessors
A	2	-
B	1	-
C	3	A
D	2	A, B
E	1	C, D
F	3	D
G	1	E, F

(a) Draw the network diagram of activities for the project

(b) Identify the critical path.

St. Xavier's College

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Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Physics

Core Course VI

PY 1542 : QUANTUM MECHANICS

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** the questions in **one** or **two** sentences. Each question carries **1** mark.

1. What is Compton shift?
2. What is Wein's displacement law?
3. What is de Broglie hypothesis?
4. Define expectation value.
5. Explain Born's statistical interpretation of the wave function.
6. State the uncertainity principle.
7. Define Hilbert space.

P.T.O.

8. What are the characteristics of a wave function?

9. Define tunneling.

10. What are Hermitian operators?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions, not exceeding a paragraph. Each question carries **2** marks.

11. Explain the Rutherford planetary model.

12. Briefly discuss correspondence principle.

13. Briefly outline the mechanism by which photoelectrons are emitted.

14. Write down the momentum and energy operators in quantum mechanics.

15. Discuss the eigen functions and eigen values of Harmonic oscillator.

16. Discuss generalized statistical interpretation.

17. Solve the Schrodinger equation of a free particle.

18. Discuss the concept of normalization.

19. Why observables in quantum mechanics need to be Hermitian?

20. Define bound states and scattering states.

21. Explain the conditions for admissible wave functions.

22. Briefly discuss the stationary states of the free particle.

(8 × 2 = 16 Marks)

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SECTION – C

Answer **any six** questions. Each question carries **4** marks.

23. The photoelectric threshold wavelength of silver is 2762 Å. Calculate the maximum kinetic energy of the ejected electrons when the silver surface is illuminated with ultraviolet light of wavelength 2000 Å.

24. X-rays of wavelength 1.4 Å are scattered from a block of carbon. What will be the wavelength of scattered X-rays at 180° and 0°?

25. Calculate the maximum wavelength that hydrogen in its ground state can absorb where the ground state energy is -13.6 eV.

26. Find the frequency of revolution of electrons in n = 1 and n = 2 orbits.

27. Determine the de Broglie wavelength of an electron that has been accelerated through a potential difference of 100 V.

28. Calculate the expectation value of momentum of a particle trapped in a one dimensional box of width L.

29. Calculate the probability of finding the particle in the region $0 < x < a$ where the wave function of the particle confined in a box of length $-a$ to $+a$ is $\psi(x) = \{1/\sqrt{a}\}\sin(\pi x/2a)$.

30. An operator A defined by $A\psi(x) = \frac{d^{\psi}(x)}{dx} + 2\psi(x)$. Check whether the operator is linear or not.

31. The uncertainity in the velocity of a particle is equal to its velocity. If $\Delta p \cdot \Delta x = h$, show that the uncertainity in its location is its de Broglie wavelength.

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

32. Obtain the eigen functions and eigen values of a particle in an infinite square potential well.

33. Derive steady state form of Schrodinger equation from time dependent form.

34. Obtain the general uncertainity principle.

35. Derive the transmission and reflection coefficients of a particle approaching a delta function potential.

(2 × 15 = 30 Marks)

St. Xavier's College

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Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Physics

Core Course VII

PY 1543 – ELECTRONICS

(2014 Admission onwards)

Time : 3 Hours Max. Marks : 80

SECTION A

*Very short answer type questions (Answer all **10** questions of **1** mark each)*

1. What is an ideal diode?
2. Which are the most commonly used semiconductors and why?
3. Define power rating of a transistor.
4. What is stability factor of a transistor?
5. Define distortion of a power amplifier.
6. Equation gain of amplifier with negative feedback.
7. The frequency of oscillation of colpitts oscillator is _____.
8. What is modulation factor?
9. Why UJT is called double based diode?
10. What is the input stage of amp?

(10 × 1 = 10 Marks)

P.T.O.

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SECTION – B

*Short answer type questions (Answer any **eight** questions of **2** marks each)*

11. What is a voltage follower? And draw its circuit diagram.
12. Explain the features of an ideal amplifier.
13. Draw the equivalent circuit of SCR.
14. What are the advantages of LED?
15. Write a short note on demodulation.
16. Draw the frequency spectrum of AM wave,
17. What are the advantages and disadvantages of wein-bridge oscillator'?
18. What are the effects of negative feedback on amplifiers?
19. Explain the working of' practical power amplifier with the help of block diagram.
20. Explain the transistor biasing and its need.
21. With the help of circuit diagram. explain the working of full wave bridge rectifier.
22. Write short note on zener breakdown.

(8 × 2 = 16 Marks)

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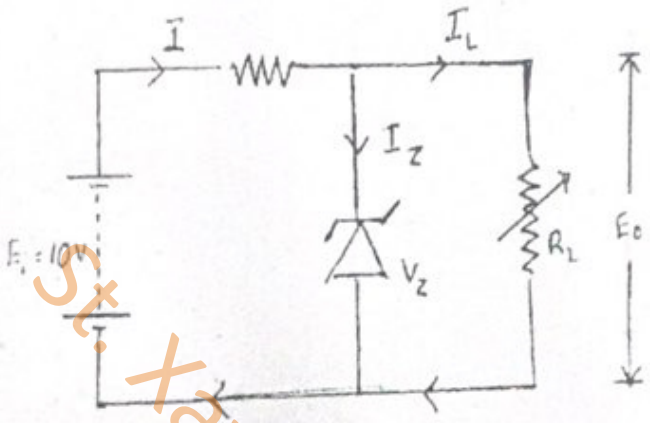
SECTION – C

*Answer any **six** questions. Each question carries **4** marks*

23. An ac. supply of 240V is applied to a half wave rectifier through a transformer of turn ratio 20:1. Find (i) The output d.c. voltage, (ii) The peak inverse voltage assume the diode to he ideal
24. Four diode used in a bridge rectifier circuit have forward resistance which may be considered at 1Ω and infinite reverse resistance. The a.c. input voltage is 240V r.m.s and load resistance is 480Ω. Calculate (i) mean load current and (ii) power dissipated in each diode.

25. A power supply A deliver 20V dc with ripple of 0.5 V r.m.s while the power supply B delivers 25 V d.c with a ripple of 10 mV r.m.s; which is better power supply.

26. A 6.4V zener is used in the circuit as shown in figure and load current is to vary from 12 to 100 mA. Find the value of series resistance R to maintain a voltage of 7.2V across the load. The input voltage is constant at 10V and the minimum zetier current is 10mA.



27. What value of series resistor is required to limit the current through a LED to 30mA with a forward voltage drop of 1.8V when connected to a 12 V supply?

28. Calculate the value of 1_g in a transistor for which $\beta = 80$ and $1_B - 20\mu A$.

29. For a certain transistor. $1_B - 20\mu A$. $1_C - 2mA$. $\beta = 80$. Calculate the leakage current 1_{CBO}

30. A transistor uses potential divider method of biasing $R_1 = 100k\Omega$. $R_2 = 20k\Omega$ and $R_E = 1k\Omega$.. Find the value of Ic; given $V_{BE} = 0.3v$

31. Find the capacitance of the capacitor required to build an LC oscillator that uses an inductor of L = 1mH to produce a sine wave of frequency 1GHz.

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

*Answer any **two** questions. Each question carries **15** marks*

32. With the help of circuit diagram explain the principle and working of half wave rectifier and full wave bridge rectifier. Compare its efficiency and ripple factor with proper equations.

33. With the help of circuit diagram explain the operation of a transistor as an amplifier and also explain the necessity for negative feed backing.

34. Describe the various methods used for transistor biasing. State their advantages and disadvantages.

35. Discuss the essentials Is of an oscillator and also discuss the circuit operation of tuned collector oscillator.

(2 × 15 = 30 Marks)

St Xavier's College

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Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Physics

Open Course

PY 1551.2 - ASTRONOMY AND ASTROPHYSICS

(2014 Admission onwards)

St. Xavier's College

.Time : 3 Hours Max. Marks: 80

SECTION – A

(Very Short Answer Type questions)

Answer **all** questions of **1** mark each.

1. Why is Astro physics called to be an extension of Astronomy?
2. What's meant by celestial Mechanics?
3. What is the basis of Lunar theory?
4. Define Chandrasekhar limit.
5. What is the ratio of brightness between the I magnitude and VIth magnitude stars?
6. What is the main source of energy in stars?
7. Explain Solstices.
8. What is meant by a protostar?
9. Name the galaxy and its type to which our solar system belongs to _____.
10. What is the force responsible for the rotation of planets around the sun?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

(Short Answer Type Questions)

Answer any **eight** questions of **2** marks each.

11. Explain the forces that counterbalance a main sequence star.

12. Give two features of a neutron star.

13. Why is a neutron star highly dense?

14. Plot an H-R diagram and mark the stars of different stages of formation in it.

15. List the colour indices of Stars.

16. Distinguish between effective temperature and colour temperature of a star.

17. What is our galaxy called and name the type of galaxy it is?

18. Explain how a star can become a White dwarf in its end state.

19. Describe a Red Giant star.

20. Why can't a black hole be seen in a telescope.

21. Distinguish between intrinsic and extrinsic variable stars.

22. What is the significance of Schwarzschild radius.

(8 × 2 = 16 Marks)

St Xavier's College

SECTION – C

Answer any **six** questions of **4** marks each.

23. Bring out the difference between Astronomy and Astrophysics and give the difference between solar time and sidereal time.

24. Discuss the Big Bang theory and how does it support the birth of the universe.

25. Discuss the constituents of the solar system in detail.

26. What are the different seasons in the earth? How are they formed?

27. Discuss the different calenders in History.

28. Discuss in detail the motion of the Earth.

29. Write notes on
    (a) Black holes
    (b) Asteroids

30. What is a comet? Discuss the motion of Halley's comet.

31. Discuss the role of sun in the solar system.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two**. Each question carries **15** marks.

32. Write in detail how the solar system is formed. Discuss the relevance of Kepler's laws in the stability of the solar system.

33. How are stars formed? Discuss the stability of stars. What happens when the star gets older with regard to its material constitution.

34. Write short notes on:
    (a) The microwave background radiation
    (b) Neutron stars
    (c) Types of Galaxies.

35. Discuss the important findings and contributions of Medieval and Ancient Astronomy.

(2 × 15 = 30 Marks)

St Xavier's College

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Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme Under CBCSS

Core Course – V

CH 1541 : PHYSICAL CHEMISTRY – I

(2014-2016 Admissions)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark. (answer in a word/sentence)

1. Define compressibility factor.
2. Define critical constants.
3. Explain the term space lattice.
4. What are intrinsic semiconductors
5. Define fluidity.
6. What is the point group of NH_3 molecule.
7. Write the first law equation for an isobaric process.
8. What is intensive thermodynamic properties? Give one example.
9. Explain the term entropy.
10. Write the symmetry elements of a C_{2v} point group.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. Each question carries **2** marks. (short answer type)

11. Calculate the *rms* velocity of N_2 at 300K.

12. Define mean free path.

13. What is meant by Osmotic pressure of a solution?

14. Define the term colligative properties.

15. Define enthalpy of vaporization.

16. State and illustrate Hess's law.

17. Discuss partition function.

18. State Carnot's theorem.

19. Explain axis of symmetry of a molecule with one example.

20. Define smectic liquid crystals.

21. State and explain the second law of thermodynamics.

22. Explain the term C_p and C_v and write down the relationship between them.

(8 × 2 = 16 Marks)

St Xavier's College

SECTION – C

Answer **any six** questions. Each question carries **4** marks. (short essay type)

23. Calculate the work done in expanding one mole of an ideal gas from a volume of 2 dm^3 to 20 dm^3 at 27° C.

24. Write a short note on metal excess defect and metal deficiency defects.

25. Derive an expression for work done in the reversible isothermal expansion of an ideal gas.

26. Derive Gibbs Duhem equation.

27. Discuss the structure of Rutile and Zinc blent.

28. Briefly describe the determination of fugacity of a gas.

29. Identify the symmetric elements present in BF_3 and H_2O.

30. Discuss how critical temperature and critical pressure are determined experimentally?

31. Write a short note on Bravis lattices.

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer **any two** questions. Each question carries **15** marks. (essay type)

32. (a) What is Joule-Thomson expansion? Show that it is an iso enthalpic process. How μ_{JT} is related with Joule-Thomson expansion.

    (b) Derive the expression for μ_{JT} ideal gas.

33. Derive Bragg's law and discuss about rotating crystal method of XRD.

34. (a) Discuss Maxwell-Botzmann distribution of molecular velocities.

    (b) Derive an expression for *rms, most probable and average.*velocity.

35. Explain Andrew's experiment on isotherms of gases showing the significance of critical constants.

(2 × 15 = 30 Marks)

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Reg. No. : .....

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Fifth Semester B.Sc.Degree Examination, December 2019

First Degree Programme under CBCSS

Core Course VII

CH 1543 : PHYSICAL CHEMISTRY – II

(2014–2016 Admissions)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions. Each question carries 1 mark.

1. State Nernst heat theorem.
2. Write the relationship between entropy and probability.
3. What is meant by citical micelle concentration?
4. What is Compton effect?
5. Antistoke's lines are less intense than stoke's lines. Give reason.
6. Sketch the stretching modes of CO_2 molecule.
7. How is the energy of radiation related to its wave number?
8. How many allowed spin states are there for a nucleus with spin quantum number.

P.T.O.

9. How many normal modes of vibrations may a diatomic molecule have?

10. Define Parachor.

(10 × 1 = 10 Marks)

PART – B

Short answer type. Answer **any eight** questions, Each question carries **2** marks.

11. What is meant by residual entropy? Give example of a substance posses residual entropy.

12. Define partition function. How is it related to temperature?

13. Explain Hardy – Schulz rule.

14. Distinguish between Chemical and Physical adsorption.

15. What is meant by a well behaved function?

16. Write the expression for energy and wave function of a particle in a ID box.

17. What is the essential condition for a molecule to absorb microwave radiation?

18. Calculate the reduced mass of carbon monoxide. [C = 12; O = 16].

19. What is all auxochrome?

20. Define molar extinction coefficient.

21. How is the magnetic moment of a paramagnetic substance varies with the number of unpaired electrons?

22. CO_2 molecule have zero dipole moment. Why?

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Short essay type. Answer **any six** questions, Each question carries **4** marks.

23. Derive the expression for internal energy in term of partition function.

24. Write the statement of third law of Thermodynamics and explain.

25. The rotational spectrum of gaseous HBr has a series of equispaced lines separated by 16.94 cm^{-1}. Calculate the moment of inertia for HBr.

26. Write down the Schrodinger Wave equation for hydrogen atom in Cartesian and spherical polar co-ordinates arid explain the terms.

27. Given that the force constant for the carbon – oxygen bond in CO is 1850.60 N m^{-1}. Calculate the fundamental vibrational frequency in s^{-1}.

28. Explain the term chemical shift in NMR spectroscopy.

29. How is the magnetic moment of a paramagnetic substance varies with the number of unpaired electrons? Calculate the magnetic moment of Chromium atom.

30. Explain the application of colloids.

31. What is electron spin resonance spectroscopy? Write the important uses of this technique.

(6 × 4 = 24 Marks)

St. Xavier's College

PART – D

Essay type. Answer **any two** questions, Each question carries **15** marks.

32. (a) Evaluate absolute entropy of a gas using third law of Thermodynamics.

(b) Derive the expression for Langmuir adsorption isotherm.

33. Describe briefly the principle of microwave spectroscopy What are its applications.

34. (a) Discuss the postulates of Quantum mechanics.

    (b) Explain the electrical and optical properties of colloids.

35. Write notes on

    (a) Chromophore

    (b) spin — spin Splitting

    (c) Dipolemoment and molecular structure.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

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Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Mathematics

Core Course

MM 1541 : REAL ANALYSIS — I

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

All the first **ten** questions are compulsory. They carry 1 mark each.

1. Define an ordered set.
2. Find the supremum of $E = \{1, 1/2, 1/3, \ldots\}$
3. State the Archimedean property of R.
4. Define a bounded set of real numbers.
5. Give an example of an infinite set which has no limit points.
6. Define a Cauchy sequence.
7. Show by an example that every bounded sequence need not be convergent.
8. State the necessary condition for convergence of a series.

9. Find $\lim_{x \to 0} \frac{x}{|x|}$.

10. Show that the sequence $\{(-1)^n\}$ is not convergent.

SECTION – II

Answer **any eight** questions (11-22). Each question carries **2** marks.

11. Show that there exists no rational number whose square is 3.

12. State the order properties of R.

13. State the triangle inequality.

14. Show that between any two real numbers there is a rational one.

15. Show that a convergent sequence has only one limit.

16. Show that the sequence $\{(-1)^n\}$ is not convergent.

17. Check whether the sequence $\{2n + (-1)^n\}$ monotonic or not.

18. Show that a Cauchy sequence of real numbers is bounded.

19. Show that $\lim_{n \to \infty} \frac{\sin n}{n} = 0$.

20. Find $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$.

21. Show that $\sum_{1}^{\infty} \frac{1}{\sqrt{n+1}}$ is divergent.

22. Show that $\sum_{1}^{\infty} \frac{1}{n(n+1)} = 1$.

St. Xavier's College

SECTION – III

Answer **any six** questions (23- 31). Each question carries **4** marks.

23. State and prove density theorem.

24. State squeezing theorem for sequences.

25. Give an example of sequences $\{x_n\}$ and $\{y_n\}$ which are not convergent but the sequence $\{x_n y_n\}$ is convergent.

26. Show that $\sum_{1}^{\infty} \frac{\cos n}{n^2}$ is convergent.

27. Show that the sequence $\left(\frac{2n+3}{3n-2}\right)$ is convergent.

28. Test for convergence the series $\sum_{1}^{\infty} n^{\frac{1}{n}}$.

29. Show that $\lim_{n\to\infty} n^{1/n} = 1$.

30. Show that $\lim_{x\to 0} x \sin(1/x) = 0$.

31. Discuss the convergence of the series whose n^{th} term is given by

$u_n = (10n+1)/(n(n+1)(n+2))$.

SECTION – IV

Answer **any two** questions (32-35). Each question carries **15** marks.

32. (a) If $\{I_n\}$ is a sequence of intervals in R such that $I_n \supseteq I_{n+1} (n = 1, 2, 3, \ldots)$ then $\bigcap_{n=1}^{\infty} I_n$ is non empty.

(b) Prove that a monotonic sequence is convergent if and only if it is bounded.

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33. (a) Show that $\sum_{1}^{\infty} \frac{1}{n^p}$ converges if p > 1 and diverges if $p \leq 1$.

(b) State the sequential criterion for a limit of a function with giving an example.

34. (a) Let $\{x_n\}$ and $\{y_n\}$ be two sequences of real numbers such that $\lim x_n = x$ and $\lim y_n = y$. Show that

$$\lim(x_n y_n) = \lim x_n \cdot \lim y_n = xy.$$

(b) Prove that every bounded infinite set has at least one limit point.

35. (a) Establish Cauchy criteria for convergence of sequence of real numbers.

(b) Define a contractive sequence and show that every contractive sequence is a convergent sequence.

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme Under CBCSS

Mathematics

Core Course — V

MM 1542 : COMPLEX ANALYSIS — I

(2014 admn. onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – I

All the first **ten** questions are compulsory. They carry **1** mark each.

1. Express $\frac{1}{i}$ in the form $a+bi$.

2. What is the geometrical representation of $\{z : z = \bar{z}\}$?

3. Define Cauchy sequence.

4. Define region.

5. Define analyticity at a point.

6. If $f(z) = u + 7i$ is an analytic function, then u is ...

7. State Uniqueness theorem for power series.

8. Give an example of an entire function.

9. Find $\int_C z^2 dz$, where C is any smooth closed curve.

10. State Integral theorem.

SECTION – II

Answer any **eight** questions from among the questions 11 to 22. These questions carry **2** marks each.

11. Find square roots of $2i$.

12. Show that $\sum_{k=1}^{\infty} \frac{1}{k+i}$ diverges.

13. Prove that $\overline{z_1 z_2} = \bar{z}_1 \cdot \bar{z}_2$.

14. Prove that $\{z_n\}$ converges if and only if $\{z_n\}$ is a Cauchy sequence.

15. Prove that power series are infinitely differentiable within their domain of convergence.

16. State sufficient conditions for differentiability of $f(z)$ at a point z.

17. Find the radius of convergence of $\sum_{n=0}^{\infty} \frac{(-1)^n z^n}{n!}$.

18. Verify that $f(z) = z^2$ is analytic in the complex plane.

19. Prove that $\sin 2z = 2 \sin z \cos z$.

20. Let $f = u + iv$ is analytic in a region D and u is a constant. Prove that $f(z)$ is a constant.

21. Prove that $e^z \neq 0$, for any $z \in c$.

22. Let C_1 and C_2 are smoothly equivalent. Prove that $\int_{C_1} f = \int_{C_2} f$.

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SECTION – III

Answer any **six** questions from among the questions 23 to 31. These questions carry **4** marks each.

23. Prove that a polynomial $P(x, y)$ is analytic if and only if $P_y = iP_x$.

24. Show that $f(z) = |z|^2$ is differentiable at $z = 0$, but nowhere analytic.

25. Let $f(z) = \begin{cases} \frac{z^2}{z}, & when\ n \neq 0 \\ 0, & when\ z = 0 \end{cases}$. Even though partial derivatives of the component functions exists and satisfy Cauchy-Riemann equations at $z = 0$, show that $f(z)$ is not differentiable at $z = 0$.

26. Show that the power series $f(z) = z - \frac{z^3}{3!} + \frac{z^5}{5!} - \ldots$ is equal to $\sin z$.

27. Evaluate $\int_C f(z)dz$, where $f(z) = \frac{1}{z}$ and C is $z(t) = R\cos t + iR\sin t,\ 0 \leq t \leq 2\pi$, $R \neq 0$.

28. Let C be a smooth curve; let f and g be continuous functions on C; and let α be any complex number. Prove that $\int_C [f(z) + g(z)]dz = \int_C f(z)dz + \int_C g(z)dz$.

29. Show that, if f is a continuous real-valued function and $f << 1$, then $\int_{|z|=1} f << 4$.

30. Suppose f is the derivative of an analytic function F-that is, $f(z) = F'(z)$, where F is analytic on the smooth curve $C: z(t), a \leq t \leq b$. Prove that $\int_C f(z)dz = F(z(b)) - F(z(a))$.

31. State and prove closed curve theorem.

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SECTION – IV

Answer any **two** questions from among the questions 32 to 35. These questions carry **15** marks each.

32. (a) Suppose $f(z) = \sum_{n=0}^{\infty} C_n Z^n$ converges for $|z| < R$. Prove that $f'(z)$ exists and equals to $\sum_{n=0}^{\infty} nC_n Z^{n-1}$ throughout $|z| < R$.

(b) Prove that a region S is polygonally connected.

33. (a) Show that the function $f(z) = xy + iy$ is nowhere analytic.

(b) Suppose f is analytic in a region and $f' \equiv 0$ there. Show that f is constant.

(c) If real part of an analytic function is a constant, then show that the function is a constant.

34. (a) State and prove necessary conditions for differentiability of $f(z)$ at point z.

(b) Prove that $2\sin z_1 \cos z_2 = \sin(z_1 + z_2) + \sin(z_1 - z_2)$.

35. State and prove Rectangle theorem.

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programe Under CBCSS

Mathematics

Core Course

MM 1544 – VECTOR ANALYSIS

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

All the first **ten** questions are compulsory. Each carries **1** mark.

1. Define Gradient of a real valued function in R^2.
2. If $r = xi + yj + zk$, show that $curlr = 0$.
3. Define conservative vector field.
4. Define curl of a vector point function.
5. If C is the curve represented by the equation $x = \sin t$, $y - \cos t, z = t$, $0 \le t \le 2\pi$, evaluate $\int_C ydx - xdy + dz$.
6. State Greens theorem.
7. State Gauss Divergence theorem.
8. Write sphere $x^2 + y^2 + z^2 = 1$ as the graph of a vector valued function.

P.T.O.

9. Write the formula for finding the unit normal to a surface $r = x(u,v)i + y(u,v)j + z(u,v)k$.

10. State conservation of energy principle.

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** questions from this section. Each question carries **2** marks.

11. Find the directional derivative of $f(x,y) = e^{xy}$ at $(-2,0)$ in the direction of the unit vector that makes an angle $\frac{\pi}{3}$ with the positive x-axis.

12. Find the divergence and curl of the vector field $F(x,y,z) = x^2yi + 2y^3zj + 3zk$.

13. Evaluate $\int_C f(x,y)\,ds$ where $f(x,y) = \frac{x^3}{y}; C: y = \frac{1}{2}x^2, 0 \le x \le 2$.

14. Evaluate the line integral $\int_C (xy + z^3)ds$ from $(1,0,0)$ to $(-1,0,\pi)$, where C is the helix given by $x = \cos t, y = \sin t, z = t, (0 \le t \le \pi)$.

15. Find the work done by the force $F = (y+z)i + (z+x)j + (x+y)k$ over the line segment from $(0,0,0)$ to $(1,1,0)$ followed by the segment from (1,1,0) to (1, 1,1).

16. If F is a conservative vector field, then prove that the work done by F over any smooth closed curve C is equal to zero.

17. Find the area of the surface extending from the circle $x^2 + y^2 = 1$ in the xy-plane to the parabolic cylinder $z = 1 - x^2$.

18. Evaluate $\int_C (x-y)\,dx + (y-x)\,dy$ using Greens theorem where C is the square bounded by $x = 0$, $y = 0, x = 1$ and $y = 1$.

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19. Using line integral to find the area enclosed by the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$.

20. Evaluate $\int_{\sigma}\left(x^2+y^2+z^2\right)dS$ where σ is a sphere of radius 2 centered at origin.

21. Evaluate the flux of $F=xi+yj+zk$ across the surface $x^2+y^2+z^2=1$.

22. Evaluate outward flux of $F=xi+yj+zk$ across the unit cube.

(8 × 2 = 16 Marks)

PART – C

Answer **any six** questions from among the questions 23 to 31. These questions carry **4** marks each.

23. Let $f(x,y)=x^2e^y$. Find the maximum value of a directional derivative at (–2,0) and find the unit vector in the direction in which the maximum value occurs.

24. Show that the divergence of the "verse square filed $F(x,y,z)=\frac{c}{\left(x^2+y^2+z^2\right)^{3/2}}(xi+yj+zk)$ is zero.

25. Find the work done by the force $F(x,y))=(x+y)i+xyj+z^2k$ on a particle which moves along the line segments (0,0,0) to (1,3,1) to (2,–1,4).

26. Show that $F=\left(e^x\cos y+yz\right)i+\left(xz-e^x\sin y\right)j+(xy+z)k$ is conservative and find its potential function.

27. Show that the integral $\int_{(0,0)}^{(1,\pi/2)}e^x\sin y\,dx+e^x\cos y\,dy$ is independent of path and find its value.

28. Show that for a vector valued function $r(t), r.\frac{d}{dt}\left(r\times\frac{dr}{dt}\right)=0$.

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29. Verify Greens theorem for the field $F(x,y)=(x-y)i+xj$ and the region R bounded by the unit circle centered at origin.

30. Evaluate the surface integral $\int\int_{\sigma} x^2 ds$ over the sphere $x^2+y^2+z^2=1$.

31. If the curved lamina σ with constant density δ_0 is the portion of the paraboloid $z=x^2+y^2$ below the z-plane $z=1$, find the mass of the lamina.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** questions from among the questions 32 to 35. These questions carry **15** marks each.

32. (a) Prove that for any continuously differentiable vector point function $f(x,y,z)$, $div(curlf)=0$.

(b) Prove that $curl(\phi F)=\phi curl\, F+\nabla\phi\times F$, for any smooth vector field F and for any amooth scalar point function ϕ.

33. (a) State stokes theorem and verify it for the field $F=yi-xj$ for the hemisphere S given by $x^2+y^2+z^2=9, z\geq 0$.

(b) Integrate $G(x,y,z)=xyz$ over the surface of the cube cut from the first octant by the planes $x=1, y=1$ and $z=1$.

34. Find the flux of $F=yzj+z^2k$ outward through the surface S cut from the cylinder $y^2+z^2=1, z\geq 0$ by the planes $x=0$ and $x=1$.

35. Using divergence theorem find the outward flux of the vector field $x^3i+y^3j+z^3k$ across the surface of the region that is enclosed by the hemisphere $z=\sqrt{a^2-x^2-y^2}$ and the plane $z=0$.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Mathematics

Core Course VIII

MM 1545 ABSTRACT ALGEBRA I

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer all the **Ten** are compulsory. They carry **1** mark each

1. Consider the three permutations in S_6

$$\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 3 & 1 & 4 & 5 & 6 & 2 \end{pmatrix} \quad \tau = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 4 & 1 & 3 & 6 & 5 \end{pmatrix}$$ compute $\tau^{-2}\sigma$.

2. Any two groups of three elements are isomorphic. True or False.

3. Find the number of generators of the cyclic group of order 12.

4. Define symmetric group.

5. Determine whether the function $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = x + 1$ is a permutation.

6. Show that Klien 4-group is not isomorphic to $\mathbb{Z}_4$.

P.T.O.

7. Find the orbit of 1 under σ ; where

$$\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 3 & 1 & 4 & 5 & 6 & 2 \end{pmatrix}$$

8. S_n is not cyclic for any n True or False. Why?

9. Find the order of the Permutations $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 8 & 2 & 6 & 3 & 7 & 4 & 5 & 1 \end{pmatrix}$.

10. Find the number of cosets of $\langle 18 \rangle$ in $\mathbb{Z}_{36}$.

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** questions from this section. Each question caries **2** marks

11. Show that in a group G with operation $*$, there is only one identity element e such that $e * x = x * e = x$ for all $x \in G$.

12. Prove or disprove "A group may have more than one identity element".

13. Show that in a group $(ab)^{-1} = b^{-1}a^{-1}$.

14. Prove that if a is a generator of a cyclic group G, then a^{-1} is also generator of G.

15. Show by an example that every proper subgroup of a nonabelian group may be abelian.

16. Let p and q be prime numbers. Find the number of generators of the cyclic group $\mathbb{Z}_{pq}$.

17. Prove that a Cyclic group with only one generator can have at most 2 elements.

18. Find all the subgroups of $\mathbb{Z}_{36}$.

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19. Show that a group with at least two elements but with no proper nontrivial subgroup must be finite and of prime order.

20. Let A be an infinite set. Let K be the set of all $\sigma \in S_A$ that move at most 50 elements of A. Is K a subgroup of S_A? Why?

21. Show that if H is a subgroup of index 2 of a finite group G, then every left coset of H is also a right coset of H.

22. Show that a group with at leat two elements but with no proper nontrivial subgroup must be finite and of prime order.

(8 × 2 = 16 Marks)

PART – C

Answer **any six** questions from this section. Each question caries **4** marks

23. Show that a nonempty subset H of a group G is a subgroup of G if and only if $ab^{-1} \in H$ for all $a, b \in H$.

24. Prove that if G is an abelian group with identity e, then all elements of G satisfies the equation $x^2 = e$ form a subgroup H of G.

25. Prove that "Any infinite cyclic group G is isomorphic to the group $\mathbb{Z}$ of integers under addition."

26. Show that for every subgroup H of S_n for $n \geq 2$ either all the permutations in H are even or exactly half them are even?

27. Show that every permutation in S_A can be written as a product of at most $n-1$ transpositions.

28. If A is a set, then a subgroup H of S_n is transitive on A *if* for each a, $b \in A$ there exists $\sigma \in H$ such that $\sigma(a) = b$.. Show that *if* A is a nonempty finite set, then there exists a finite cyclic subgroup H of S_A with |H| = |A| which is transitive on A.

29. Show that if n is odd, then an abelian group of order $2n$ contains precisely one element of order 2.

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30. Show that for every subgroup H of S_n. for $n \geq 2$ either all the permutations in H are even or exactly half them are even?

31. Show that if σ is a cycle, then σ^2 is a cycle, provided that the length of σ is an odd integer.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** questions from this section. Each question caries **15** marks

32. (a) Prove that "Let G be a group and let $a \in G$. Then

$$H = \{a^n \mid n \in \mathbb{Z}\}$$

is a subgroup of G and is the smallest subgroup of G that contains a, that is, every subgroup containing a contains H."

(b) Let the binary operation of a group G be closed on a nonempty finite subset H of G. Show that H is a subgroup of G.

33. (a) Prove that "A subgroup of a cyclic group is cyclic".

(b) If m is a positive integer and n is any integer, then there exist unique integers q and r such that

$$n = mq + r \text{ and } 0 \leq r < m.$$

34. State and prove Cayleys Theorem

35. Prove that "Let G and G' be groups and let $\phi : G \to G'$ be one to one such that $\phi(xy) = \phi(x)\phi(y)$ for all $x, y \in G$. then $\phi[G]$ is a subgroup of G' and ϕ provides an isomorphism of G with $\phi[G]$".

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme Under CBCSS

Physics

Core Course V

PY 1541 – METHODOLOGY IN PHYSICS AND RELATIVISTC MECHANICS

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

(Very Short answer type questions. Answer **all** questions of **1** mark each)

1. Write any two objectives of Research
2. What is meant by qualitative research
3. Define extraneous variables in the context of Research design
4. What is meant by sample design in research
5. What are non-inertial frames of references?
6. Mention the consequences of Lorentz transformation.
7. What are non-inertial frames of references?
8. When is an equation said to be invariant under a transformation?
9. What is meant by relativity of simultaneity?
10. Explain time dilation in relativity.

(10 × 1 = 10 Marks)

P.T.O.

SECTION– B

(Short answer type questions. Answer any **eight** questions of **2** marks each)

11. What are the crireria for good research.

12. In the context of Research design,explaifl Research Hypothesis.

13. What is meant by dominant error? How can they be minimised?

14. Interpretation is a fundamental component of research process-Explain.

15. Calculate the energy equivalent of 1 mass unit, given Avogadro number 6.023×10^{23}.

16. Assuming Lorentz-Fitzgerald contraction, calculate the apparent length of a meter scale moving at a speed of 2.5×10^{8} m/s

17. A clock keeps correct time. With what speed should it be moved relative to an observer so that it may seem to lose 2 minutes in 24 hours.

18. Write the Hamiltonian for a simple pendulum

19. Prove that the generalized momentum conjugate to a cyclic coordinate is conserved

20. Prove that the Hamiltonian H of a conservative system is equal to the total energy of the systems

21. Discuss the concept of space and time in Special theory of Relativity.

22. Calculate the rest energy of an electron if the rest mass of the electron is 9.1×10^{-31} kg. **(8 × 2 = 16 Marks)**

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SECTION– C

(Answer any **six** questions of **4** marks each)

23. Discuss any two problems faced by researchers in India.

24. Discuss on Research and scientific method.

25. What are the different types of energy?

26. Explain and illustrate the procedure of selecting a random sample.

27. Deduce the variation of mass with velocity.

28. Give examples to prove the relation $E=mc^2$.

29. Explain the concepts of Lorentz transformation.

30. Deduce the Hamilton's equations for Harmonic oscillator.

31. (a) From D'Alembert's principle deduce Hamilton's principle.

    (b) From Hamilton's Principle deduce Lagrange's equations.

(6 × 4 = 24 Marks)

SECTION– D

(Answer any **two** questions. Each question carries **15** marks)

32. What are the different types of Scientific Research. Discuss the development of scientific research in India.

33. Discuss the various procedure while unity the main text and conclusion of research thesis.

34. Discuss the Michelson – Morley expt and its results and their interpretations in the theory of relativity

35. What are Significant digits? Differentiate between absolute and relative errors. How are errors graphically represented. **(2 × 15 = 30 Marks)**

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme Under CBCSS

Physics

Core Course VIII

PY 1544 : ATOMIC AND MOLECULAR PHYSICS

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **one** or **two** sentences, **each** question carries **1** mark.

1. Explain Larmor theorem.
2. What are singlet and triplet states?
3. What do you understand by fine structure of spectral lines?
4. Define Lande's splitting factor "g".
5. What do you meant by chemical shift NMR spectroscopy?
6. What is a spherical top molecule? Give two examples.
7. What is rotational constant? How does it influence a spectrum?
8. What is infrared spectroscopy?

P.T.O.

9. Homonuclear diatomic molecules do not show vibrational spectra. Why?

10. Why stokes lines are more intense than antistokes lines?

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions, **not** exceeding a paragraph; **each** question carries **2** marks.

11. Distinguish between normal and anomalous Zeeman effect.

12. What is Paschan back effect?

13. Give an account of quantum numbers associated with the vector atom model.

14. Explain spin-orbit coupling.

15. State and explain Pauli's exclusion principle.

16. State and explain Moseley's law.

17. Explain isotope effect in rotational spectra.

18. What is an anharmonic oscillator?

19. Explain the P branch and R branch of a rotation vibration spectrum.

20. Explain Raman scattering and Rayleigh scattering.

21. State Bohr's correspondence principle.

22. What are the applications of NMR spectroscopy?

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

Answer any **six** questions, **each** question carries **4** marks.

23. Calculate the wavelength separation between the two component lines which are observed in the normal zeeman effect. The magnetic field used is 0.4 weber/m^2) specific charge = 1.76×10^{11} Ckg^{-1} and $\lambda = 6000$ Å

24. Calculate the energy in electron volts of a beam of electrons used to excite hydrogen atoms so as to emit first Balmer series.

25. An electron in a particular state of hydrogen atom has a magnetic potential energy of about $10^{-23} J$. Estimate the magnitude of magnetic field acting on the spin magnetic moment of the electron which is of the order of 1 Bohr magneton.

26. The moment inertia of the CO molecule is $1.46 \times 10^{-46} kgm^{-2}$. Calculate the energy in electron Volt and the angular velocity in the lowest rotational energy levels of the CO molecule.

27. Given that the spacing between the vibrational levels of a CO molecule is 8.45×10^{-2} electron volt and the reduced mass is $1.14 \times 10^{-24} kg$. Calculate the value of the force constant k of the bond in a CO molecule.

28. The exciting line in an experiment is 5460Å. Find the wavelength of the anti-stokes line.

29. What is the minimum voltage to be applied to a X-ray tube to produce X-ray of 1 Å?

30. Calculate the wavelength separation between the unmodified line of wavelength 6000 Å and the modified lines when a magnetic induction of $1 Wbm^{-2}$ is appeared in normal Zeeman effect.

31. Calculate the strength of the magnetic field required to give processional frequency of 100MHz for ^{17}O nucleus. Given $g_N = -0.757$, $\mu_N = 5.051 \times 10^{-27} JT^{-1}$, $I = 5/2$.

(6 × 4 = 24 Marks)

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SECTION – D

Answer any **two** questions; **each** question carries **15** marks.

32. Give an account of Somerfields atom model. How does it account for the fine structure of hydrogen?

33. Give an account of the production, properties and application of X rays.

34. Obtain an expression for the rotational energy levels of a diatomic molecule taking it as a rigid rotator. Draw the energy level diagram of a rigid diatomic rotator.

35. What is an ESR Spectrophotometer? Explain it in detail with block diagram. Explain the application of ESR.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Chemistry

Core Course

CH 1541 : PHYSICAL CHEMISTRY – I

(2017 Admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries 1 mark.

1. The number of atoms per unit cell in FCC lattice is ————.
2. For an ideal gas ,the compressibility factor z is equal to ————.
3. Vapour pressure of a liquid ———— with increase in Temperature.
4. Liquids with high intermolecular attractive forces have ———— viscosity.
5. For equilibrium $\Delta S_{universe}$ = ————.
6. For a spontaneous change, $\Delta S_{system} + \Delta S_{surroundings}$ is ————.
7. The number of crystal systems among 32 crystal classes is ————.
8. Give the SI unit of coefficient of viscosity.
9. A tetrahedral CH_4 molecule has four ———— axes.
10. All ———— molecules have a C_∞ axis.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. **Each** question carries 2 marks.

11. What is plane of symmetry?

12. What is a point group?

13. A system absorbs 6 kJ of heat and performs 3000 J of work Calculate the internal energy change produced.

14. What is Gibbs energy?

15. State the 3rd law of thermodynamics.

16. What is an isochoric process?

17. Mention two factors that affect viscosity.

18. What is a semipermeable membrane? Give an example.

19. What are liquid crystals?

20. What are Weiss indices?

21. What is explosion temperature?

22. What is normality of a solution?

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

23. What features distinguish a real gas from an ideal gas?

24. At what temperature RMS velocity of N_2 equals that of CO_2 at 300K?

25. The Weiss coefficients of *a* lattice plane are 3, 3 and 2. Calculate its Miller indices.

26. Why do crystals diffract X-rays?

27. Explain how reverse osmosis is applied in desalination of sea water?

28. How do you find out Avogadro number from crystallographic data?

29. Calculate the osmotic pressure of an aqueous solution of 10 g of glucose ($C_6H_{12}O_6$) in 600 ml.

30. Give the group multiplication table for the point group C_{2v}.

31. One mole of an ideal gas is isothermally compressed from a pressure of 1.013×10^5 Pa to a pressure of 1.013×10^7 at 300 K. Calculate

    a) ΔG and

    b) ΔS.

(6 × 4 = 24 Marks)

St Xavier's College

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

32. a) Show that Cp – Cv = R for one mole of an ideal gas

    b) State Hess's law.

    c) The standard enthalpy of combustion of benzene is –3268.0 kJ/mol. The standard enthalpies of formation of $CO_2(g)$,$H_2O(l)$are –393.5 kJ/mol and 285.8 kJ/mol respectively Calculate the standard enthalpy of formation of benzene.

33. a) Discuss the following properties of liquids on the basis of intermolecular attractions.

1) vapour pressure.

2) viscosity

3) surface tension.

b) Discuss the determination of viscosity by viscometer method.

34. a) Discuss the powder method for the X-ray diffraction studies of crystals

b) Explain the features of Zinc blende structure.

35. Derive Vander Waal 's equation of state and give its importance.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Core Course VII

CH 1543 : ORGANIC CHEMISTRY II

(2017 Admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer all. Each question carries **1** marks. Answer in one word to maximum two sentences.

1. Which has a higher boiling point

   (a) O-nitro phenol

   (b) p-nitro phenol?

2. How can you convert formaldehyde to benzyl alcohol?

3. Give the name of the reaction which produces salicylic acid by the action of carbon dioxide on sodium phenate under pressure and subsequent hydrolysis.

4. How is salicylic acid converted into phenol?

5. Give the structure of coumarin.

6. Which kind of amines are obtained by Gabriel's phthalimide synthesis?

7. Give the structure of t Butyl amine and N-methylmethanamine.
8. In the NMR spectrum of ethanol, proton of which group will show absorption at lowest field strength?
9. In UV-spectroscopy, what is the effect of conjugation in shifting absorption maximum?
10. What is meant by atom economy.

(10 × 1 = 10 Marks)

SECTION – B

(Short answer questions)

Answer **any eight** questions. Each question carries **2** marks

11. Explain the acidic nature of phenol.
12. Give the mechanism of Benzidine rearrangement.
13. Give two tests to distinguish acetaldehyde from formaldehyde.
14. Give the structure of the compound from which o-Methylallyl phenol can be obtained by Claisen rearrangement. Give the equation.
15. How is benzene converted into adipic acid?.
16. What is Williamson's synthesis?
17. Illustrate Wolff kishner reduction.
18. Write down the structure of Urotropine .How is it prepared?.
19. What are auxochromes? Give examples to such groups?
20. Explain the terms hyper chromic effect and hypo chromic effect?
21. Explain chemical shift.
22. Explain one ultrasound assisted reaction and its superiority over its thermal counterpart.

(8 × 2 = 16 Marks)

SECTION– C

(Short Essay questions)

Answer **any Six** questions. Each question carries **4** marks

23. Explain the mechanism of pinacol - pinacolone rearrangement.

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24. Give the detailed method of separation of primary, secondary and tertiary amines. Give the equations.

25. How will you accomplish the following conversions?

    (a) Toluene to 2-hydroxy-2-phenylacetic acid

    (b) Benzene to m-nitrobenzoic acid

26. Write down the mechanism of the following reaction.

    (a) Deckmann rearrangement

    (b) Reimer-Tiemann reaction.

27. Explain illustratively the term Nef's reaction?

28. Illustrate Hoffmann elimination .Discuss the mechanism.?

29. Give one microwave-assisted reaction that can be carried out in aqueous medium.

30. Explain the splitting of a signal into multiplets due to spin spin coupling taking the example of HNMR spectrum of Ethanol.

31. Discuss the U V spectral characteristics of benzene ? Mention the applications of the UV spectroscopy in organic studies.

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay Questions)

Answer **any Two**. Each question carries 15 marks

32. State and discuss the 12 principles of green chemistry

33. Sketch the low resolution NMR spectra and the fine structure of NMR spectra of the following compounds. Show the signals in the increasing order of chemical shift values. Indicate the relative intensities of the lines obtained due to spin spin coupling

    (a) Toluene.

    (b) 1– Propanol

    (c) 2– Bromobutanoic acid

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34. Explain

(a) HVZ reaction

(b) MPV reduction

(c) Oppenaur oxidation

(d) Biodiesel

(e) Crown ethers

35. (a) Discuss the importance of $LiAlH_4$ and $NaBH_4$ in carbonyl chemistry.

(b) Discuss the preparation and important reactions of toluene sulphonic acid.

(c) Discuss the synthesis and applications of Saccharin

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 8) H – 6323

Reg. No. : .....

Name : .....

Fifth Semester B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

Core Course : CO1543

ACCOUNTING FOR SPECIALISED INSTITUTIONS

(2014 Admission onwards)

(Common for CC 1544 (2014 Admission onwards))

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark :

1. Which insurance does not provide any bonus to the policy holders?
2. Schedule 8 of bank final accounts explain _____.
3. What are standard assets?
4. What is life insurance?
5. Mention any two stock exchanges in India.
6. Explain tariff dividend control reserve.
7. What do you mean by clear profit?

P.T.O.

8. What are group c shares?

9. Who is the present CAG of India?

10. Who is responsible for auditing of govt accounts?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each question carries **2** mark.

11. What is valuation balance sheet?

12. What is bonus in reduction of premium?

13. Explain the terms SLR.

14. What do you mean reversionary bonus?

15. What is development reserve?

16. What is general reserve of electricity company?

17. Explain the functions of stock broker.

18. What is backwardation?

19. A life insurance company disclosed a fund of Rs. 14,00,000 on 31/3/2019 before taking the following into consideration

(a)	Interest approved on investment	14,250
(b)	Outstanding premium	14,400
(c)	Bonus in reduction in premium	3,375
(d)	Claims intimated but not admitted	8,700
(e)	Claims covered under reinsurance	3,250

Prepare a statement for re computation of funds.

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20. What do you mean by short selling?

21. From the following information prepare schedule 3 of banking companies.

(a)	Demand deposit	40,000
(b)	Office expenses	5,000
(c)	Borrowing from RBI	50,000
(d)	Savings bank deposits	80,000
(e)	Bills payable	2,000
(f)	Term deposits	1,00,000

22. What do you mean by Kerb Market?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. Each question carries **4** mark.

23. Krishna bank limited has the following bills to be discounted on 31/3/2018. Compute the rebate on bills discounted.

Date of bill	Amount	Term	Rate of discount
10/1/2015	9,00,000	3 months	10%
16/2/2015	7,00,000	4 months	12%
11/3/2015	5,00,000	3 months	11%

24. How do you treat rebate on bills discounted if

(a) Rebate on bills discounted is given in trail balance

(b) If rebate on bills discounted is given in adjustment

St. Xaviers College

25. The life assurance fund of Bharat life insurance company limited was 4192000 as on 31/12/2018 its actuarial valuation on 31/12/2018 disclose a net liability of 4040000 an interim bonus of 40000 was paid to the policy holders. It is now proposed to carry forward 32000 and divide the balance between policy holders and share holders. You are required to show

(a) valuation balance sheet

(b) distribution of net profit

(c) final bonus payable to policy holders.

26. Explain the difference between life insurance and general insurance.

27. Explain the functions of CAG in India.

28. Write a note on features of bank accounting.

29. Write a note on contingency reserve.

30. Give a summarized format of Revenue account of insurance companies.

31. From the following information calculate the amount of provision to be made in the profit and loss account for the year ended 31st March.

Particulars	Amount in lakhs
Standard	10,000
Sub standard	64,000
Doubtful assets :	
For one year	3,200
For two years	1,800
For three years	900
For more than 3 years	1,100
Loss assets	3,000

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

32. What is stock exchange? Explain the major functions of stock exchange.

33. From the following particular prepare profit and loss account of global bank limited for the year ended 31/3/2019.

Interest on loans	2,59,000
Interest on fixed deposit	2,75,000
Rebate on bills discounted	49,000
Commission charge to customers	8,200
Establishment expenses	54,000
Interest on cash credit	2,23,000
Interest on current account	42,000
Rent and taxes	18,000
Interest on over draft	54,000
Director's and audit fees	4,200
Interest on savings bank deposit	68,000
Discount on bills discounted	1,95,000
Postage	1,400
Printing	2,900
Sundry charges	1,700

St. Xavier's College

34. Following are the details extracted from the books of Bharat Life Assurance Company as on 31st March 2019

	Amount in lakhs
Premium	1,200
Reinsurance premium ceded	250
Reinsurance premium accepted	175
Claims paid	675
Surrenders	125
Commission on direct business	50
Commission on reinsurance ceded	20
Commission on reinsurance accepted	15
Consideration for annuity granted	40
Annuities paid	32
Interest dividend (after deduction of income tax at source 2 lakhs)	23
Reinsurance claims received	12
Registration fees	2
Salaries and allowances	15
Managerial remuneration	3
General expenses	2
Depreciation on fixed assets	3
Profit on sale of investment	5

St. Xavier's College

Prepare revenue account after adjusting the following

Premium outstanding Rs. 20 lakhs

Claims outstanding Rs. 4 lakhs

Reinsurance claim receivable Rs. 12 lakh

Commission on direct business Rs. 3 lakhs

35. Following balances are extracted from the books of city light supply corporation as on 31st March 2019

Equity shares		1,64,700
Debentures		60,000
Sundry Creditors on open account		300
Depreciation fund		75,000
Capital expenditure on 31.3.2018	2,85,000	
Capital Expenditure on 2018-19	18,300	
Sundry debtors for Current supplied	12,000	
Other debtors	150	
Stores in hand	1,500	
Cash in hand	1,500	
Cost of generation of electricity	9,000	
Cost of distribution of electricity	1,500	
Management expenses	3,600	
Depreciation	6,000	
Interest on debentures	3,000	
Interim dividend	6,000	
Sale of current		39,000
Meter rent		
Balance of net revenue accounts as on 01.0.4.2018		8,550
	3,47,550	3,47,550

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Prepare

(a) Capital account

(b) Revenue account

(c) Net Revenue account

(d) General balance sheet.

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 6) H – 6332

Reg. No. : .....

Name : .....

Fifth Semester B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

Core Course : CO 1541/CC 1542

FUNDAMENTALS OF INCOME TAX

(2014 Admission onwards)

(Common for Commerce/Commerce with Computer Application)

St Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Who is a deemed assessee?
2. What is meant by LTCG?
3. What is depreciation?
4. What do you mean by income tax?
5. Define FRV.
6. What do you mean by vocation?
7. What do you mean by arrears of rent?
8. Define Annual value.
9. What is meant by LTC?
10. What do you mean by grossing up of securities?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. **Each** question carries **2** marks.

11. What is meant by casual income? Write any two examples.

12. What is Gross Total Income?

13. What are the deductions from Gross Salary u/s 16?

14. What do you mean by transferred balance?

15. What is meant by assessment year?

16. What do you mean by converted property?

17. When an assessee becomes an assessee in default?

18. Define salary.

19. Why income from other source is called residuary heads of income?

20. What do you mean by clubbing of income?

21. What are the conditions for deducting unrealized rent?

22. What is the tax treatment for medical benefit given to the employee in a private hospital?

(8 × 2 = 16 Marks)

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SECTION – C

Answer **any six** questions. Each question carries **4** marks.

23. What are the assets not treated as capital assets?

24. Explain the tax treatment of RFA.

25. Mr. Ram was getting pension from a bank Rs. 12,000 pm. With effect from 1.6.2018, he commuted two third of the pension and received Rs. 4,80,000.

Compute the taxable amount of pension if :

a) He received gratuity at the time of retirement

b) He did not receive gratuity at the time of retirement.

26. Compute depreciation allowance from the following information.

WDV on 1.4.2018	1,10,000
Furniture purchased on 2.6.2018	15,000
Furniture purchased on 8.1.2019	20,000
Sale of old furniture on 10.3.2019	3,000

Rate of depreciation 10%

27. Explain the provisions relating to set-off of losses.

28. Following are the incomes of Mr. Mohan for the previous year 2018-19.

Profit from business in Canada received in India	Rs. 1,20,000
Income from house property in India	Rs. 14,000
Income from house property in Canada received in India	Rs. 30,000
Income from business in Uganda deposited in a bank there	Rs. 45,000
Profit from business in Indonesia deposited in a bank there,	
This business is controlled from India	Rs. 1,00,000
Share of profit from a firm in India	Rs. 14,000
Salary received in India for services rendered in Iraq	Rs. 54,000
Income from business in India controlled from Bangladesh	Rs. 43,000

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Compute total income of Mr. Mohan if he is

a) Ordinarily resident

b) Not ordinarily resident and

c) Non- resident.

29. From the following information, compute Long Term Capital Gain;

Cost of acquisition of house property on 1.1.2003	Rs. 1,33,000
Cost of improvement on 21.4.2005	Rs. 1,00,000
Cost of improvement on 2.2.2008	Rs. 3,20,000
Sales consideration on 16.5.2018	Rs. 15,23,000

CII – 2002 – 03 = 105; 2005 – 06 = 117; 2007 – 08 = 129; 2018 – 19 = 280.

30. What are the inadmissible expenses while computing income from business or profession?

31. Determine annual value from the following information.

Municipal value	40,000
Fair rental value	42,000
Monthly rent (let-out)	4,000
Vacancy	1 month
Municipal tax (paid by tenant)	2,000

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

32. Explain the residential status of an Individual.

33. Compute Income from House property.

Municipal value	Rs. 43,000
Fair rent	Rs. 45,000
Standard rent	Rs. 50,000
Monthly rent	Rs. 4,000
Municipal tax	Rs. 4,300
Interest on loan	Rs. 14,000

Unrealized rent for the previous year 2015–16 is recovered during the previous year 2018–19 Rs.10,000.

Arrear of rent of 2016-17 Rs. 4,000 is recovered during the previous year 2018–19.

The house remained vacant for 1 month.

34. Mr. Kishore is working in a Private Bank in Ahmadabad. The following are his incomes.

- Basic Pay — Rs. 30,000 p.m
- D.A — 20%
- Entertainment Allowance — 1,000 p.m
- City Compensatory Allowance — 1000 p.m
- Children education Allowance (for two children) — 300 p.m

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- Deputation Allowance 500 p.m
- House rent allowance 3,000 p.m (he resides in his own house)
- His domestic telephones expenses are paid by the bank amounted to Rs. 6,000
- The bank gave him a watch as birthday gift, the cost of which was Rs. 2,000
- He owns a car which he uses for official purposes also. The expenses reimbursed by the employer in this respect of the car amounted to Rs. 40,000. A driver is also provided. The cubic capacity of the car is 1,500.
- He paid professional tax Rs. 2,500 during the year.

Compute income from salary for the A.Y 2019 – 20 .

35. Explain the various income exempted u/s 10.

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 6) H – 6333

Reg. No. : .....

Name : .....

Fifth Semester B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

Core Course : CO 1542 / CC 1543 / CX 1543/ HM 1543 / TT 1543

COST ACCOUNTING

(2014 Admn. onwards)

(Common for Commerce / Commerce with Computer Application / Commerce and Tax Procedure and Practice / Commerce and Hotel Management and Catering / Commerce and Tourism and Travel Management)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark :

1. Define cost accounting.
2. What is labour?
3. What is cost centre?
4. What are overheads?
5. What is ABC analysis?
6. What is primary distribution?
7. Define unit costing.

P.T.O.

8. What is machine hour rate?

9. What is absorption costing?

10. What is idle time?

(10 × 1 = 10 Marks

SECTION – B

Answer any **eight** questions. Each question carries **2** marks.

11. What is cost unit?

12. What is batch costing?

13. What are semi-variable costs? Give an example.

14. What is opportunity cost?

15. State the importance of cost classification.

16. What is prime cost?

17. What are the objectives of material control?

18. What is bin card?

19. What is re-order level?

20. What are casual workers?

21. What is apportionment of overheads?

22. What is over absorption?

(8 × 2 = 16 Mark

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SECTION – C

Answer any **six** questions. Each question carries **4** marks. :

23. Distinguish between cost accounting and financial accounting.

24. Explain the steps in purchase procedure.

25. What are the advantages of perpetual inventory system?

26. Distinguish between time wage system and piece wage system.

27. Calculate EOQ from the following data

    Annual usage — 6000 units

    Cost of material per unit — Rs.20

    Cost of placing an order — Rs.60

    Annual carrying cost of per unit — 10% of inventory value.

28. Calculate re-order level and maximum level from the following data

    Time lag for procurement of materials: Maximum 6 months, Minimum – 2 months

    Maximum usage — 300 units

    Minimum usage — 200 units

    Re-order quantity — 750 units

29. The standard time for a job is 10 hours. Actual hours taken are 8. Wage rate per hour is Rs.5. Calculate total earnings and effective rate of earnings per hour under Halsey Plan.

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30. Calculate machine hour rate from the following

Cost of machine — Rs.8,000

Cost of installation — Rs.2,000

Scrap value after 10 years — Rs.2,000

Rates and rent for a quarter for the shop — Rs.300

General lighting — Rs.20 p.m.

Shop supervisor's salary — Rs.600 per quarter

Insurance premium for a machine — Rs.60 p.a

Estimated repairs — Rs.100 p.a

Power 2 units per hour @ 5 per 100 units

Estimated working hours p.a 2000

The machine occupies ¼ of the total area of the shop. The supervisor is expected to devote 1/6th of his time for supervising the machine. General expenses are to be apportioned on the basis of floor area.

31. From the following transactions, calculate the closing balance of materials in units and value by using FIFO method

2018	
Nov 1	Opening balance 200 units at Rs.2 per unit
Nov 2	Issued 40 units
Nov 8	Returned to vendors 50 units
Nov 12	Purchased 150 units at Rs.3 per unit
Nov 19	Issued 60 units
Nov 26	Purchased 210 units at Rs.4 each
Nov 30	Stock audit note shows a shortage of 10 units

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer any **two** questions. Each question carries **15** marks. :

32. Explain the advantages of cost accounting.

33. The cost accounts of a firm reveals the following details:

Stock on hand on 01-03-2018 :	
Raw materials	25,000
Finished goods	17,360
Stock on hand on 31-03-2018:	
Raw materials	26,250
Finished goods	15,750
Purchase of raw materials	21,900
Work in Progress:	
01-03-2018	8,220
31-03-2018	9,100
Sales of finished goods	72,310
Direct wages	17,150
Work expenses	8,340
Office and administration expenses	6,870
Selling and distribution expenses	4,210
Sale of scrap	330

Prepare a cost sheet for the month March, 2018.

34. X Ltd has three production departments A, B and C and two service departments D and E. From the following figures, calculate the overhead rate per labour hour:

	Rs.		Rs.
Indirect materials	15,000	Rent rates and taxes	10,000
Indirect wages	10,000	Electric power for machinery	15,000
Depreciation on machinery	25,000	Electric power for lighting	500
Depreciation on buildings	5,000	General expense	15,000

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Items	Total	A	B	C	D	E
Direct material (Rs.)	60,000	20,000	10,000	19,000	6,000	5,000
Direct wages (Rs.)	40,000	15,000	15,000	4,000	2,000	4,000
Value of machinery (Rs.)	2,50,000	60,000	1,00,000	40,000	25,000	25,000
Floor area (Sq.Ft)	50,000	15,000	10,000	10,000	5,000	10,000
Horse power of machines	150	50	60	30	5	5
No. of light points	50	15	10	10	5	10
Labour hours	15,000	5,000	5,000	2,000	1,000	2,000

The expenses of service departments D and E are to be apportioned as follows:

	A	B	C	D	E
D	40%	20%	30%	-	10%
E	30%	30%	40%	–	–

35. Prepare a Stores Ledger account for the following transactions on the basis of LIFO method

2018 Jan 1 Opening balance 12000 kg at Rs.7.5
Jan 1 Purchased 22000 kg at Rs.7.6
Jan 1 Issued 5000 kg
Jan 5 Issued 7000 kg
Jan 12 Issued 8000 kg
Jan 13 Surplus returned from production 2000 kg
Jan 18 Issued 12000 kg
Jan 22 Purchased 25000 kg at Rs.7.40
Jan 23 Issued 7000 kg
Jan 28 Issued 6000 kg
Jan 31 Stock verified and 500 kg was found to be excess

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 3) H – 6334

Reg. No. : .....

Name : .....

Fifth Semester B.Com. Degree Examination, December 2019

First Degree programme under CBCSS

Stream 1: Finance

Elective course III: CO 1561.1

FINANCIAL MARKETS AND SERVICES

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

(Answer **all** questions Each question carries **1** mark)

1. What do you mean by portfolio?
2. Who is a merchant banker?
3. What is money market?
4. Which is the regulatory authority of stock exchanges?
5. What is EMI?
6. What do you mean by mutual fund?
7. Who is a lessor?
8. Define Financial market.
9. What is DUPN?
10. What is OTCEI?

(10 × 1= 10 marks)

P.T.O.

SECTION – B

(Answer any **eight** questions .Each question carries **2** marks)

11. What is call money market?
12. Define financial services.
13. What is securitization?
14. What do you mean by infrastructure financing?
15. Define forfaiting.
16. What do you mean by credit rating?
17. What is meant by foreign exchange market?
18. What is growth fund?
19. What do you mean by primary market?
20. What is online trading?
21. What is NBFC?
22. What do you mean by financial instruments?

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

(Answer any **six** questions. Each question carries **4** marks)

23. Explain different types of factoring.
24. What are the objectives of securitization?
25. State the differences between operating lease and financial lease.

26. What are the features of a developed money market?

27. What are the elements of indian financial system?

28. Write a note on Housing finance.

29. What are the advantages of venture capital?

30. What are the objectives of credit rating?

31. State the differences between hire purchase and installment system.

(6 × 4 = 24 Marks)

SECTION – D

(Answer any **two** questions. Each question carries **15** marks)

32. Explain money market instruments.

33. Explain different types of mutual funds.

34. What are the functions of merchant banker?

35. Briefly explain the classification of financial markets.

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 3) H – 6337

Reg. No. : .....

Name : .....

Fifth Semester B.Com. Degree Examination, December 2019

First Degree Programme under CBCSS

Open Course I : CO 1551.3/CC 1551.3/CX 1551.3/TT 1551.3

CAPITAL MARKET OPERATIONS

(2014 Admn. onwards)

(Common for Commerce / Commerce with Computer Application / Commerce and Tax Procedure and Practice / Commerce and Tourism and Travel management)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **1** word or to a maximum of **2** sentences each. Each question carries **1** mark.

1. What is a Capital market?
2. What is primary market?
3. What is Beta?
4. What do mean by Money Market?
5. What is Call Option?
6. What is Money market?
7. Who is a STT?

P.T.O.

8. What is Arbitration?

9. What is Stock exchange?

10. What are the Securities traded on a stock exchange?

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions in not exceeding **1** paragraph each. Each question carries **2** marks.

11. What is Book-building?

12. What is meant by Call Option?

13. What is a stop limit order?

14. What is a Depository?

15. What are stuck indicess?

16. What is NSE?

17. Explain rolling settlement.

18. What is Margin Trading?

19. What are derivatives?

20. What is a forward contract?

21. What is the importance of capital market?

22. Which are the major indices in India?

(8 × 2 = 16 Marks)

St Xavier's College

SECTION – C

Answer any **six** questions in about **120** words each. Each question carries **4** marks. :

23. Explain Capital market instruments.

24. Distinguish between primary and secondary market.

25. What are the types of limit orders?

26. Discuss the nature of capital market.

27. What are the types of stock exchange orders?

28. What is known as a Depository Participant?

29. How is a demat account opened?

30. Explain the services provided by Depository.

31. Explain the Functions of an index.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions in not exceeding **4** pages each. Each question carries **15** marks.

32. Discuss the institutions involved in the Indian capital rnarket.

33. What are the functions of capital market?

34. Explain the products dealt in the secondary markets.

35. Explain the process of buting and selling of securities.

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 3) H – 6356

Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Group 2(a)

Malayalam and Mass Communication Vocational Course – VII

MX 1571 – RADIO PROGRAMME PRODUCTION

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

I. Answer the following in one or two words or in one or two sentences.

1. Radio bridge.
2. Adobe Audition cc
3. Ham radio
4. AM.
5. Radio Club of Bombay.
6. Dubbing.
7. Radio magazine.
8. Frequency.
9. Cellular radio.
10. Lapel.

(10 × 1 = 10 Marks)

P.T.O.

II. Answer **any eight** questions each in **60** words.

11. What are the different types of headphones ?

12. What is timber?

13. Radio announcements

14. Discuss the importance of sound mixing

15. What is running commentary?

16. What are the different types of waves.

17. List the equipments used in a radio studio.

18. Appreciate any two radio programmes of your choice.

19. What are the characteristics of radio news writing?

20. What are the different sound formats?

21. What are the characteristic of a radio discussion?

22. Important of Akashavani.

(8 × 2 = 16 Marks)

III. Answer **any six** questions each in **120** words.

23. Discuss the features of audio editing software.

24. What are the differences between satellite radio and internet radio?

25. Write a script for a radio drama of five minutes duration.

26. Discuss the different types of speakers.

27. Argue the role of community radio in the rural development.

28. What are the qualities needed for a radio jockey?

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29. Trace the brief history of FM broadcasting.

30. Discuss the functions of microphones in Radio Production.

31. What are the different types of radio programmes?

(6 × 4 = 24 Marks)

IV. Write long essays on **any two** of the following.

32. Describe different types of radio broadcasting in detail.

33. Elucidate the strengths and limitations of radio as a mass medium.

34. Explain the different stages of a radio programme production.

35. Discuss the structure and format of radio news bulletin.Also explain the skills required for producing a news bulletin.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Malayalam and Mass Communication

Core Course VII

MX 1541 : നാടോടി വിജ്ഞാനീയം

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

I. എല്ലാ ചോദ്യത്തിനും ഒരു വാക്കിലോ രണ്ടു വാക്യത്തിലോ ഉത്തരം എഴുതുക.

1. നാടോടി വിജ്ഞാനീയം എന്ന ഗ്രന്ഥം രചിച്ചതാര്?

2. സീതക്കളി ഇന്ന് അറിയപ്പെടുന്നത് ഏതു പേരിലാണ്?

3. മദ്ധ്യകേരളത്തിലെ ഭഗവതിക്കാവുകളിൽ വർഷത്തിലൊരിക്കൽ നടത്തുന്ന അനുഷ്ഠാനാത്മക പ്രകടനരൂപം ഏത്?

4. ഫോക്‌ലോർ എന്ന പദം ആദ്യമായി പ്രയോഗിച്ചതാര്?

5. ഇക്കോ-ടൈപ്പ് എന്ന ആശയം ആദ്യമായി അവതരിപ്പിച്ചതാര്?

6. ഫോക്‌ലോർ എന്ന പദത്തിന്റെ അർത്ഥമെന്ത്?

7. ഫോക്‌ലോറിസം എന്ന ആശയത്തിന്റെ വക്താവാര്?

8. അജ്ഞാതഫോക്‌ലോർ എന്നാലെന്ത്?

P.T.O.

9. അവചപുരാവൃത്തം - നിർവ്വചിക്കുക.

10. കേരള ഫോക്‌ലോർ അക്കാദമിയുടെ ആസ്ഥാനമെവിടെ?

(10 × 1 = 10 Marks)

II. ഒരു ഖണ്ഡികയിൽ കവിയാതെ എട്ടു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

11. പ്രായോഗിക ഫോക്‌ലോർ എന്നാലെന്ത്?

12. നാടോടി വിജ്ഞാനീയം എന്ന പദത്തിന്റെ അർത്ഥവ്യാപ്തിയെന്ത്?

13. പ്രചലിത ഫോക്‌ലോർ - കുറിപ്പെഴുതുക.

14. കടങ്കഥയുടെ ഘടനയെന്ത്?

15. തോറ്റംപാട്ടുകൾ എന്നാലെന്ത്?

16. പൊറാട്ടുനാടകം - കുറിപ്പെഴുതുക.

17. പുരാവൃത്തത്തെ നിർവ്വചിക്കുക.

18. പെരുന്തച്ചൻ കഥയുടെ മനഃശാസ്ത്രാധിഷ്ഠാനം വ്യക്തമാക്കുക.

19. ഫോക്‌ലോർ മ്യൂസിയത്തിന്റെ പ്രാധാന്യമെന്ത്?

20. നാടൻ കലാവിരുത് - കരവിരുത് എന്നീ പദങ്ങൾകൊണ്ട് വിവക്ഷിക്കുന്നതെന്ത്?

21. മാർഗ്ഗംകളിയിലെ പ്രതിപാദ്യമെന്ത്?

22. പഴഞ്ചൊല്ലുകളുടെ ധർമ്മമെന്ത്?

(8 × 2 = 16 Marks)

III. **120** വാക്കിൽ കവിയാതെ ആറു ചോദ്യത്തിന് ഉത്തരം എഴുതുക.

23. നാടൻപാചകവിദ്യയുടെ ധർമ്മങ്ങൾ വിവരിക്കുക.

24. ഫോക്‌ലോറിസം എന്നാലെന്ത്?

St. Xavier's College

25. വിവിധ സൂത്രരൂപങ്ങൾ ഏവ? വിശദമാക്കുക.

26. കുറത്തിയാട്ടത്തെക്കുറിച്ച് വിവരിക്കുക.

27. കടങ്കഥയെ എങ്ങനെ വർഗ്ഗീകരിക്കാം?

28. നാടൻപാട്ടുകളുടെ പ്രായോഗികമേഖലകളെ പരിചയപ്പെടുത്തുക.

29. ഫോക്‌ലോറിന്റെ സവിശേഷതകളേവ?

30. വടക്കൻപാട്ടിന്റെ ഇതിവൃത്തമെന്ത്? വടക്കൻപാട്ടുകളിൽ പുരുഷരിയങ്കുരത്തിന്റെ പ്രാധാന്യമെന്ത്?

31. ഐതിഹ്യങ്ങളെ തരംതിരിക്കുന്നതെങ്ങനെ?

(6 × 4 = 24 Marks)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ രണ്ടു ചോദ്യത്തിന് ഉപന്യാസം തയ്യാറാക്കുക.

32. നാടോടി ഗീതങ്ങളുടെ സവിശേഷതകൾ ഏവ?

33. നാടൻ ഭക്ഷണരീതിയെക്കുറിച്ചും പാചകവിദ്യയെക്കുറിച്ചും ഉപന്യസിക്കുക.

34. വിവിധ ഫോക്‌ലോർ നിർവ്വചനങ്ങളെ വിമർശനബുദ്ധ്യാ വിലയിരുത്തുക.

35. നാടോടി വിജ്ഞാനീയത്തിലെ സങ്കേതങ്ങളെക്കുറിച്ചും പുതിയ പ്രവണതകളെക്കുറിച്ചും ഉപന്യസിക്കുക.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Malayalam and Mass Communication

Core Course VIII

MX 1542 : കേരള സംസ്കാരം ഭാഗം II

(2014 Admission onwards)

Time : 3 Hours Max. Marks : 80

I. എല്ലാ ചോദ്യത്തിനും ഒരു വാക്കിലോ രണ്ടു വാക്യത്തിലോ ഉത്തരം എഴുതുക.

1. ഹരിനാമകീർത്തനം എഴുതിയതാര്?

2. കേരള സംസ്ഥാനത്തിലെ ആദ്യത്തെ മുഖ്യമന്ത്രി ആര്?

3. കൂനൻകുരിശ് സത്യം നടന്ന വർഷം ഏത്?

4. കേരള ഗാന്ധി എന്ന പേരിൽ അറിയപ്പെടുന്നതാര്?

5. ചാന്നാർ ലഹളയുടെ കാരണം എന്ത്?

6. അയ്യങ്കാളി രൂപീകരിച്ച സംഘടന ഏത്?

7 ഭാഗവതത്തെ അടിസ്ഥാനമാക്കി ചെറുശ്ശേരി എഴുതിയ കാവ്യം ഏത്?

8. അദ്വൈത മതസ്ഥാപകൻ ആര്?

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St. Xavier's College

9. എസ്.എൻ.ഡി.പി. രൂപീകരിച്ച വർഷം ഏത്?

10. കേരള സാഹിത്യ അക്കാദമി സ്ഥിതിചെയ്യുന്നത് എവിടെ?

(10 × 1 = 10 Marks)

II. **ഒരു** ഖണ്ഡികയിൽ കവിയാതെ **എട്ടു** ചോദ്യത്തിന് ഉത്തരം എഴുതുക.

11. യോഗക്ഷേമസഭ.

12. കേരളത്തിലെ അനുഷ്ഠാനകലകൾ.

13. അയിത്തോച്ചാടനം.

14. ചട്ടമ്പിസ്വാമികൾ.

15. ക്ഷേത്രപ്രവേശന വിളംബരം.

16. മലയാളി മെമ്മോറിയൽ.

17. ചവിട്ടു നാടകം.

18. ശ്രീമൂലം പ്രജാസഭ.

19. വൈക്കം സത്യാഗ്രഹം.

20. പുന്നപ്ര വയലാർ സമരം.

21. ഉത്തരവാദ ഭരണം.

22. പഴശ്ശിരാജ.

(8 × 2 = 16 Marks)

III. **120** വാക്കിൽ കവിയാതെ ഏതെങ്കിലും **ആറു** ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

23. മലബാർ കലാപത്തിന്റെ കാരണങ്ങൾ എന്തെല്ലാം?

24. കേരളത്തിലെ ഭക്തിപ്രസ്ഥാനത്തിൽ എഴുത്തച്ഛൻ വഹിച്ച പങ്ക് എന്ത്?

St. Xavier's College

25. മിഷനറിമാർ മലയാള ഭാഷയ്ക്ക് നൽകിയ സംഭാവനകൾ എന്തെല്ലാം?

26. ഗുരുവായൂർ സത്യാഗ്രഹത്തിന്റെ ദേശീയ പ്രാധാന്യം വിവരിക്കുക.

27. മതകോളനീകരണത്തിനെതിരായുള്ള ചെറുത്തുനില്പായിരുന്നു കൂനൻകുരിശുസത്യം - വിശദീകരിക്കുക.

28. ഡച്ച്-പോർച്ചുഗീസ് ഭരണങ്ങൾ കേരള സംസ്കാരത്തിൽ ചെലുത്തിയ സ്വാധീനത്തെക്കുറിച്ച് വിവരിക്കുക.

29. മൈസൂർ ആക്രമണവും അനന്തരഫലങ്ങളും വിശദമാക്കുക.

30. സാമൂഹിക ജീവിതത്തിൽ ശ്രീനാരായണഗുരുവിന്റെ വിപ്ലവകരമായ പ്രവർത്തനങ്ങൾ എന്തെല്ലാമായിരുന്നു?

31. ആധുനിക ഗദ്യത്തിന്റെ വളർച്ചയ്ക്ക് പത്ത മാസികകളുടെ സംഭാവനകൾ വിലയിരുത്തുക.

(6 × 4 = 24 Marks)

IV. **മൂന്നു** പുറത്തിൽ കവിയാതെ ഏതെങ്കിലും **രണ്ടു** ചോദ്യത്തിന് ഉത്തരം എഴുതുക.

32. വിദേശാധിപത്യം കേരള സംസ്കാരത്തിൽ ഉളവാക്കിയ ചലനങ്ങൾ എന്തെല്ലാം?

33. കേരളത്തിന്റെ കലാപാരമ്പര്യത്തെക്കുറിച്ച് ഉപന്യസിക്കുക.

34. കേരളീയ നവോത്ഥാനത്തിന്റെ വക്താക്കളെപ്പറ്റി ഉപന്യസിക്കുക.

35. സ്വാതന്ത്ര്യാനന്തരം കേരളത്തിലെ വിദ്യാഭ്യാസ മേഖലയിലുണ്ടായ പുരോഗതിയെപ്പറ്റി ചർച്ച ചെയ്യുക.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

Career Related First Degree Programme Under CBCSS

Group 2(a) Malayalam and Mass Communication

Vocational Course VIII

MX 1572 INTRODUCTION TO TELEVISION PRODUCTION

(2014 Admn onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

PART – A

Answer all the **ten** questions, each one in **one** or **two** sentence.

1. Aperture control
2. Colour temperature
3. Key Light
4. Piece to Camera
5. Panning
6. Medium Shot
7. Teleprompter
8. Tripod
9. White balance
10. Fade-in

(10 × 1 = 10 Marks)

P.T.O.

PART – B

Write short notes, not exceeding **sixty** words, on any **eight** of the following.

11. Chroma keying
12. Qualities of a script
13. What is ambient sound?
14. What do you mean by Audio Mixing Console
15. Qualities of a camera person
16. Rule of thirds
17. Three point lighting
18. Visual editor
19. Special effects supervisor
20. Background music
21. Sound bridge
22. Types of light

(8 × 2 = 16 Marks)

St. Xavier's College

PART – C

Write short essays, each not exceeding **120** words, on any **six** of the following.

23. Describe the characteristics of television.
24. What are the objectives of visual editing?
25. List out the important stages in pre-production.
26. What are the different camera movements?
27. Explain in detail the different studio lighting instruments.

28. Brief the importance of script in a good TV production. -

29. Explain the properties of lighting

30. Write in detail about different types of shot scales.

31. Discuss the potentials and limitations of TV as a medium

(6 × 4 = 24 Marks)

PART – D

Write long essays, each not exceeding **500** words, on any **two** of the following.

32. Discuss in detail single and multi-camera productions

33. TV production is evolving as time passes. Analyse the statement.

34. Explain the organisation and functioning of production department of a TV channel'

35. What are the major stages involved in post-production? Discuss in detail

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.A. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Group 2(a)

Malayalam and Mass Communication

Open Course

MX 1551.1 — FILM APPRECIATION

(2014 Admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

Answer **all** the questions, **each** one in one or two sentences.

1. Biopic
2. The Great Train Robbery
3. Shooting script
4. Art Director
5. Fade
6. Master shot
7. Low-angle shot
8. Match cut
9. Close-up
10. Dolly

(10 × 1 = 10 Marks)

P.T.O.

Write short notes, **each** not exceeding sixty words, on **any eight** of the following.

11. Storyboard

12. Backlighting

13. Ambient sound

14. Background characters

15. Treatment

16. Casting

17. Crossing the line

18. Automatic dialogue replacement

19. Jump cut

20. Trailer

21. Call Sheet

22. Deep focus

(8 × 2 = 16 Marks)

Write short essays, each not exceeding **120** words, on **any six** of the following.

23. What are short films?

24. Discuss mise-en-scene.

25. What is an avant-garde film?

26. When did cinema arrive in India?

27. Explain the contributions of Lumiere Brothers.

28. Discuss Italian Neo-realism in film making.

St. Xavier's College

29. Why is lighting very important in a film?

30. Discuss Continuity editing.

31. Describe the differences between studio-shooting and shooting at locations.

(6 × 4 = 24 Marks)

Write long essays, each not exceeding **500** words, on **any two** of the following.

32. Elucidate the post-production work of a feature film.

33. The documentary is 'the creative treatment of actuality' Discuss.

34. What do you mean by the director's cut? Analyze any one movie of a director of your choice.

35. Examine the contributions of Adoor Gopalakrishnan and G. Aravindan to Malayalam film industry.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme Under CBCSS

Group 2(a) Botany and Biotechnology

Vocational Course X

BB 1572 : PLANT BIOTECHNOLOGY

(2014 admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type; Maximum **two** sentences. Answer **all** the questions; **each** question carries **1** mark.

1. Define callus.
2. What are cytokinins?
3. What is *Agrobacterium tumefaciens*?
4. What are transgenic plants?
5. Name any two commonly used plant tissue culture media.
6. Define totipotency.
7. Name the enzymes which are known as 'molecular Scissors' in transgenics.
8. What is mean by anther culture?

P.T.O.

9. Define cybrids.

10. What are pBR 322?

(10 × 1 = 10 Marks)

SECTION – B

Short answer type; answer in **one** paragraph; answer any **eight** questions; **each** question carries **2** marks.

11. What are the potential uses of artificial seeds?

12. How virus free plants produced through tissue culture?

13. Write short note on somatic embryogenesis?

14. What is mean by biological method of gene transfer? Give an example.

15. Define biopharming? What are its uses?

16. How explants are sterilized in plant tissue culture technique?

17. Differentiate between differentiation from dedifferentiation.

18. Differentiate between caulogenesis from rhizogenesis.

19. Why periodic subculturing of callus is essential?

20. How media sterilization is achieved in plant tissue culture work?

21. Differentiate between direct organogenesis from indirect organogenesis.

22. Explain the non agricultural applications of transgenic plants.

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

Short essay type; Answer should not exceed **120** words. Answer any **six** questions; **each** question carries **4** marks.

23. What are the advantageous of suspension culture over callus culture?
24. Explain the basic chemical composition of MS medium.
25. Explain protoplast culture and its applications.
26. Write an account on micropropagation with its application.
27. Write a note on hairy root culture and its applications.
28. Describe virus mediated gene transfer in plants.
29. Define somaclonal variation. What are the possible reasons for somaclonal variation?
30. Write short notes on transgenic plants with appropriate examples and the transgene involved.
31. How callus tissue is formed in *in vitro*? What are the types of callus noticed in tissue culture?

(6 × 4 = 24 Marks)

SECTION – D

Long essay type; answer any **two** questions. **each** question carries **15** marks.

32. Explain the application of plant tissue culture in Plant Science.
33. Write an essay on the scope of plant secondary metabolites production through plant cell, tissue and organ culture.
34. Write an essay on the role of *Agrobacterium tumefaciens* in plant genetic engineering.
35. Explain briefly:

    (a) restriction endonucleases and their role in genetic engineering.
    (b) various cloning vectors, their properties and uses.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme Under CBCSS

Group 2(a) Botany and Biotechnology

Core Course

BB 1541 : PLANT PHYSIOLOGY

(2015 admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in word or **one** or **two** sentences. **Each** question carries **1** mark, draw diagrams only if specified in the questions.

1. What do you mean by Symplast pathway?
2. Why C4 Cycle is deemed as more advanced?
3. Site of auxin synthesis.
4. Write down the photosynthetic formula.
5. Site of Light reaction in chloroplast.
6. Explain Nyctinastic movement.
7. What is a co-factor?
8. Write an example of a ripening hormone.

9. What are NIF genes?

10. What is respiratory quotient?

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions, **each** questions carries **2** marks, answer not to exceed **one paragraph**.

11. What are the symptoms of Potassium deficiency?

12. Explain the Radial movement of water through the root.

13. Water is regarded as a universal solvent. Why?

14. Succulent plants of the family Crassulaceae will be sour in taste in the evening explain why?

15. What is foliar nutrition?

16. Describe in detail the Starch-Sugar Interconversion theory of stomatal movement.

17. Write a short note on ATP yield of Anaerobic respiration.

18. What is the significance of Biological nitrogen fixation?

19. What is the principle of Limiting factor?

20. What are coenzymes? What makes it different from co-factors?

21. What is florigen, how is it important in plant life?

22. What is photoperiodism? Explain with examples.

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

Answer any **six** the following, answer not to exceed **120 words**, **each** question carries **4** marks.

23. Transpiration is termed as a necessary evil, why?

24. Write a short note on IUB system classification.

25. Write a brief note on Lock and Key mechanism of enzyme Action.

26. Differentiate between semi-permeable and selectively permeable membrane.

27. Explain Cohesion - Tension Theory of Ascent of Sap.

28. Differentiate between Hydroponics and aeroponics.

29. C3 Cycle is Known as an evolutionary flaw, why?

30. What is the physiology of senescence, and illustrate the abscission layer?

31. What is Guttation? Illustrate the water stomata which helps in Guttation.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions in not more than **three pages**, **each** question carries **15** marks.

32. Differentiate between C3 and C4 Cycle with special emphasis on spatial separation and the advantages over photosynthetic yield.

33. What is Cyclic and non-cyclic photo-phosphorylation, explain in detail with illustration.

34. Describe in detail various steps involved in oxidative phosphorylation and the significance of terminal oxidation, comment on cyanide resistant respiration.

35. Explain the active and passive method of translocation.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Common for Group 2(a) Botany and Biotechnology and

Group 2(b) Biotechnology (Multimajor)

BB 1542/BV 1541.1 : ANGIOSPERM MORPHOLOGY AND SYSTEMATIC BOTANY

(2015 Admission onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in a word or one or two sentences. **Each** question carries **1** mark.

1. Distinguish between Raceme and Cyme.
2. Based on the position of ovary how flowers can be classified?
3. Distinguish between cohesion and adhesion.
4. What is ICBN?
5. Give one example of natural system of classification?

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6. Describe the characters of stamens in Apocynaceae.

7. Describe the gynoecium of Apiaceae.

8. Define molecular systematics.

9. Write on the placentation of Cucurbitaceae.

10. Name one fibre yielding plant from Malvaceae.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks. (Answer not to exceed one paragraph)

11. Describe Pollinium.

12. What is verticillaster inflorescence?

13. Distinguish aggregate and multiple fruit

14. What is Phylogenetic system of classification? Give one example.

15. Name two Botanical gardens in Kerala.

16. Write on the floral features of Solanaceae.

17. Describe the fruit of Apiaceae.

18. Write on the important floral features of Asclepiadaceae.

19. What are the characteristics features Verbinaceae?

20. What are the common chemicals used in herbarium Poisoning?

21. Write on the economic importance of Anacaordiaceae.

22. Mention two vegetative features of sapataceae.

(8 × 2 = 16 Marks)

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SECTION – C

Answer any **six** questions. **Each** question carries **4** marks. Answer not to exceed 120 words.

23. Describe artificial classification with example of Linnaeus.

24. Flower is considered as a modified shoot. Substantiate the statement with reasons.

25. With the help of diagrams describe the various placentations studied by you.

26. Describe the vegetative features of Apiaceae.

27. Write on the floral characters of Euphorbiaceae.

28. Illustrate and describe spikelet.

29. Write an account on Cytotaxonomy.

30. Write any four common and botanical name of economically important plants belonging to Cucurbitaceae.

31. What are the floral characters of Liliaceae? Add a note on its economic importance.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks. Answer not to exceed THREE pages.

32. List out the salient features of Asteraceae and mention its advanced features.

33. Outline the classification of Bentham and Hooker and mention its merits and demerits.

34. Writing examples, describe the classification of Inflorescence.

35. Write a detailed accont on Chemotaxonomy.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Group 2 (a) Botany and Biotechnology

BB 1572 : PLANT BIOTECHNOLOGY

(2015 admission onwards)

St. Xavier's College

Time : 3 Hours

Max. Marks : 80

SECTION – A

I. Very short answer type. Maximum **two** sentences. Answer **all** questions :

1. Define Callus.
2. What are millipore filters?
3. What is mean by anther culture?
4. Define Cybrids.
5. What are p^{BR322}?
6. Name any two chemicals used for surface sterilization of explants.
7. Name any two cytokinins used in plant tissue culture medium.
8. What is Bt cotton?
9. What are restriction enzymes?
10. Name a therapeutic protein produced by a transgenic plant.

(10 × 1= 10 Marks)

P.T.O.

SECTION– B

II. Short answer type. Answer in **one** paragraph. Answer any **eight**.

11. What is hairy root culture? What is their use?

12. How explants are sterilized in plant tissue culture technique?

13. Differentiate between callus culture from suspension culture.

14. Write short note on wet sterilization methods followed in plant tissue culture.

15. Name any two methods of protoplast isolation.

16. What is the significance of embryo culture?

17. Define totipotency.Who coined this term?

18. What are the potential uses of artificial seeds?

19. How virus free plants produced through tissue culture?

20. Write short note on somatic embryogenesis.

21. What is mean by biological method of gene transfer? Give one example.

22. Define biopharming.What are its uses?

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

III. Short essay Answer should not exceed **120** words. Write **any six** :

23. How callus tissue is formed in *in vitro*? What are the types of callus noticed in tissue culture?

24. Write a note on the role of plant biotechnology in solving plant pathological problems.

25. Define micropropagation. What are its applications?

26. Explain the impact of transgenic plants in agriculture and horticulture.

27. Explain virus mediated gene transfer in plants.

28. What are haploid plants? How are they produced?

29. Describe the composition of MS medium.

30. Discuss the role of haploids in crop improvement.

31. Explain the methods of meristem culture and its application.

(6 × 4 = 24 Marks)

SECTION – D

IV. Essay type. Answer **any two** questions :

32. Write an essay on various methods of gene transfer practiced in plants.

33. Explain the scope and applications of plant secondary metabolite production.

34. Describe in detail about various in vitro culture methods practised in plant tissue culture.

35. Explain briefly:

(a) Various types of restriction endonucleases and their role in genetic engineering.

(b) Different types of cloning vectors, their properties and uses.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme under CBCSS

Group 2 (a) Botany and Biotechnology

BB 1573 : ANIMAL BIOTECHNOLOGY

(2015 admission onwards)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in a word or **one** or **two** sentences. Each question carries **1** mark :

1. What is primary cell culture?
2. Define organ culture.
3. What is the function of cell adhesion molecules?
4. What is suspension culture?
5. What is Hayflick limit?
6. Which is the most common serum supplement in animal cell culture media?
7. What is CHO cell lines?
8. What is factor IX?
9. Define cell viability assay?
10. What is a stem cell?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. Each question carries **2** marks. (Answer not to exceed one paragraph)

11. What is an immortalized cell line?

12. What is trypsinization?

13. What is tissue grafting?

14. Write a note on the use of fetal bovine serum in cell culture.

15. What are cryoprotectants?

16. Write the features of a spinner flask.

17. Differentiate between cell lines and cell strains.

18. Write a brief note on passaging cells.

19. What is senescence?

20. What is the procedure for reviving cryopreserved cells?

21. What is Gene therapy?

22. What is a knockout animal?

(8 × 2 = 16 Marks)

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SECTION – C

Answer **any six** questions. Each question carries **4** marks. (Answer not to exceed 120 words) :

23. Write an account of different components of the media used in animal cell culture.
24. What are the methods for animal cell transformation?
25. Discuss the use of serum - free media.
26. Write briefly on virus cultivation.
27. Write a note on the physical parameters applied in animal cell culture.
28. What are the advantages and limitations of animal cell culture?
29. Differentiate between adherent and suspension cultures.
30. What do you mean by bioethics? Discuss the ethical issues in the production of transgenic animals.
31. Differentiate between roller bottle and spinner cultures.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Each question carries **15** marks.(Answer not to exceed **3** pages)

32. Explain in detail about the equipments and other requirements to setup an animal cell culture laboratory. Briefly describe the potential applications of animal cell cultures.
33. Describe the methods for preservation and maintenance of animal cell cultures.
34. Elaborate on the various products of animal cell cultures.
35. How the transgenic animals are being created? Write a note on the practical use of transgenic animals.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2019

Career Related First Degree Programme Under CBCSS

Group 2(a) — Botany and Biotechnology

BB 1552 : FOOD AND DAIRY BIOTECHNOLOGY

(2015 Admission Onwards)

St. Xavier's College

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in a **word** or **one** of **two** sentences.

1. Name a bacteria involved in the fermentation of milk.
2. What is ELISA stands for?
3. Name one eukaryotic organism used in fermentation.
4. Define mycotoxicosis.
5. Name a common food-borne infection and its causative organism.
6. Name a natural food preservative.
7. What is the colour of resazurin?
8. Name a mold involved in spoilage of meat.

P.T.O.

9. Which is the primary protein in milk?

10. Which is the highest milk producing country in the world?

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. Answer not to exceed one **paragraph**.

11. What is a food composition data?

12. Write about any two factors affecting the growth of microorganisms.

13. What you mean by food intoxication?

14. Name a food-borne viral infection. What is its major symptom?

15. What is the role of salt in pickling?

16. What are the possible sources of food contamination?

17. What is the role of indicator organism in food safety?

18. Briefly explain the principle behind irradiation as a food preservation method.

19. Describe Hurdle technology.

20. What are the signs of spoiled food?

21. What are the three basic classes of chemical preservatives?

22. Write a short note on the methylene blue reduction test for milk quality.

(8 × 2 = 16 Marks)

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SECTION – C

Answer any **six** questions. Answer not to exceed **half** page.

23. Write note on the spoilage of meat.

24. Explain the various immunological methods for microbial examination of foods.

25. What are the reasons for the spoilage of canned food?

26. Explain the process of pasteurization and its importance in dairy industry.

27. Differentiate between Class I and Class II preservatives with examples.

28. Explain briefly about the factors affecting microbial growth in food.

29. Explain how the osmotic pressure can be utilised in the preservation of food materials.

30. What are major chemical changes occurring in spoiled food?

31. Describe the milk-borne diseases in brief.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Answer not to exceed **three** pages.

32. Elaborate on the different steps involved in industrial cheese manufacture.

33. Write an essay on fermented foods and various micro organisms involved in fermentation.

34. Give a detailed account on the various methods and techniques for the pathogenic microbial examination of foods.

35. What are the different kinds of food preservation techniques? Write the principles, advantages and disadvantages of each of them.

(2 × 15 = 30 Marks)

St. Xavier's College

(Pages : 3) H – 6709

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, January 2020

First Degree Programme under CBCSS

Chemistry

Core Course VI

CH 1542 : INORGANIC CHEMISTRY — III

(2014 - 2016 Admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

Answer **all** each carries **1** mark :

1. What is the magnetic behaviour of Cu^+ ion?
2. Acidic character of transition metal oxides ———— with increase in oxidation number.
3. Nickel is purified by ———— process.
4. The number of bridging co present in $Fe_2(CO)_9$ is ————.
5. What is Zeise's salt?
6. What is the unit of magnetic moment.
7. Give an example for bidentate ligand.
8. What is Zeigler = Natta catalyst?
9. The hybridisation of Xe in XeF_6 is ————.
10. The shape of XeF_4 is ————.

(10 × 1 = 10 Marks)

P.T.O.

Answer **any eight :**

11. Zn, Cd and Hg are not considered as transition metals. Why?
12. What is lanthanoid contraction? Explain its causes.
13. Among Fe^{2+} and Fe^{+3} which is more paramagnetic and why?
14. State and explain 18 electron rule.
15. Write any two major iron proteins in a normal adult.
16. $2C_2H_6 + 2N(Et)_2H + FeCl_2 \rightarrow \xrightarrow{?} +2[N(Et)_2H_2]^+Cl^-$.
17. Define the term ligand. Give two examples.
18. Why do tetrahedral complex not show geometrical isomerism.
19. Give an evidence that $[Co(NH_3)_5Cl]SO_4$ and $[Co(NH_3)_5SO_4]Cl$ are ionisation isomers.
20. Give any two methods for the preparation of B_2H_6.
21. List the various oxyacids of phosphorous.
22. $SiCl_4$ is readily hydrolysed but not CCl_4 why?

(8 × 2 = 16 Marks)

Answer **any six :**

23. Write any four applications of co-ordination compounds.
24. Explain why transition elements exhibit variable oxidation state.
25. Chromium is a typical metal while mercury is a liquid why?
26. Write a note on haemocyanin.
27. What is Ziegler-Natta catalyst? What is it used for?
28. $[CN(NH_3)_6^{3+}]$ is paramagnetic while $[Ni(CN)_4^{2-}]$ is diamagnetic explain why?

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29. What are silicones? Give their preparation and uses.

30. Explain lanthanoid contraction.

31. What are interhalogen compounds? Give examples.

(6 × 4 = 24 Marks)

Answer **any two**

32. Explain the extraction of lanthanides from monozite.

33. (a) Briefly discuss the biochemistry of calcium and magnesium.

    (b) Discuss the functions of haemoglobin and myoglobin.

34. For the complex $[Fe(en)_2Cl_2]Cl$ identify

    (a) the oxidation number of iron

    (b) the hybrid orbitals and shape of the complex

    (c) the magnetic behaviour of the complex

    (d) name of the complex.

35. (a) What are the different types of glasses? List their uses.

    (b) Give an account of zeolites and their uses.

(2 × 15 = 30 Marks)

St. Xavier's College

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, January 2020

First Degree Programme Under CBCSS

Chemistry

Core Course

CH 1542 : INORGANIC CHEMISTRY III

(2017 Admission)

St. Xavier's College

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Answer in a word/sentence. Each question carries **1** mark.

1. Give an example for a dihapto and a pentahapto ligand.
2. Give the general electronic configuration of lanthanides.
3. Sketch the d orbital splitting in tetrahedral complexes.
4. Explain spectrochemical series.
5. What is the oxidation state of metal in metal carbonyls.
6. Who do transition metals show variable valency?
7. Differentiate between calcination and roasting.

P.T.O.

8. What are the shapes of $[Ni(CO)_4]$ and $[NiCl_4]^{2-}$?

9. What is sodium-potassium pump?

10. Give the IUPAC name of the complex $K[Ag(CN)_2]$.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions, each question carries **2** marks. (short answer questions)

11. Explain the structure of Zeise's salt.

12. Give a short note on froth floatation and zone refining.

13. What is Beer Lambert law?

14. Explain lanthanide contraction and its consequence.

15. How does electronic spectra of the lanthanide complexes differ that of the transition metal complexes?

16. What are labile and inert complexes?

17. Discuss the structure of ferrocene.

18. Briefly explain Transition Electron Microscopy (TEM).

19. Tetrahedral complexes are generally high spin. Why?

20. What is 18 electron rule? Explain with an example.

21. List some important applications of transition metals.

22. Calculate the CFSE of the complex $[Cu(NH_3)_6]^{2+}$.

(8 × 2 = 16 Marks)

St. Xavier's College

SECTION – C

Answer **any six** questions, each question carries **4** marks. (short essay type)

23. Explain the application of coordination compounds in the qualitative and quantitative analysis.

24. Discuss the mechanism of oxygen transport in blood.

25. What are the factors affecting the stability of a complex?

26. Explain vapour phase refining and electro-refining.

27. Differentiate between atomic absorption spectroscopy and flame emission spectroscopy.

28. Briefly explain the storage and transport of iron in biological systems.

29. Give a short note on Jahn Teller distrotion and its consequence.

30. Write a note on the preparation, properties and uses of $kMnO_4$.

31. Write a note on the metallurgy of aluminium.

(6 × 4 = 24 Marks)

St. Xavier's College

SECTION – D

Answer **any two** questions, each question carries **15** marks. (essay type)

32. (a) Describe the occurrence and separation of lanthanides from monazite sand. 8

(b) Explain the factors affecting crystal field theory. 7

33. (a) Give a note on the ligands substitution reactions in metal complexes. 5

(b) Mention the applications of organometallic compounds. 5

(c) What are iron sulphur proteins? 5

34. (a) Write a note on AFM and SEM. 5

(b) Briefly explain the metallurgy of iron and zinc. 5

(c) Explain the role of metal ions in biological system with special reference to the biochemistry of magnesium and calcium. 5

35. (a) Write a note on the magnetic properties and colour of metal complexes. 5

(b) Differentiate between haemoglobin and myoglobin in terms of their structure and function. 5

(c) Explain the bonding in mononuclear and polynuclar metal carbonyls. 5

(2 × 15 = 30 Marks)

St. Xavier's College