



(Pages : 2)

F – 2251

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018
First Degree Programme under CBCSS
HISTORY

Core Course – VI

HY 1541 : Major Trends in Historical Thought and Writings
(2013 Admission Onwards)

Time : 3 Hours

PART – A

Max. Marks : 80

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

1. Clio.
2. Thucydides.
3. "Al-Tariff".
4. "The City of God".
5. Berlin Revolution.
6. Fernand Brandel.
7. "Prison Note Books".
8. "What is History" ?
9. Great Man.Theory.
10. Local History.

(10×1=10 Marks)

PART – B

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

11. Folk Literature.
12. Su-ma-Chien.
13. Explain the idea of the cyclic view of History.
14. Discuss the concept of science of history.
15. Vico's anti-Cartesian Movement.

P.T.O.

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16. "The System of Positivistic Policy".
17. Assess the features of Seminar on history.
18. Examine the conception of Historicism.
19. Base and super structure.
20. Describe the doctrine of "idea of progress".
21. "Feudal Society" of Marc Bloch.
22. Foucault's "archaeology of knowledge".

(8×2=16 Marks)

PART – C

Answer **any six** of the following in **not** more than **120** words, **each** carrying **four** marks.

23. Assess the features of Roman historiography.
24. Analyse the weaknesses of church historiography.
25. Briefly analyse the views expressed by Herodotus in his composed work 'The Histories'.
26. Point out the merits of enlightenment historiography.
27. Examine the influence of vico on intellectual history.
28. Assess the relevance of Quasi History.
29. Discuss the influence of structuralism in History.
30. Critically evaluate the universal history of Ibn Khaldoun.
31. What do you mean by positivism ? Discuss its contribution in making history scientific.

(6×4=24 Marks)

PART – D

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

32. Explain the concept of historical materialism and its influence on the writing of history.
33. Sketch the salient features of Greek historiography.
34. "Annales school and its historians definitely effected a shift in historical writing"- Comment.
35. Assess the importance of Subaltern studies as a counter hegemonic movement in historical writing.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme under CBCSS

ECONOMICS

Core Course - VI

EC 1541 : Money and Modern Banking

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION - I

Attempt all questions. Each question carries one mark.

1. Narrow money.
2. PIN.
3. Minimum reserve system.
4. Debit card.
5. ATM.
6. Reverse Repo.
7. Near money.
8. RTGS.
9. Promissory note.
10. NPA.

(10×1=10 Marks)

SECTION - II

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

11. What do you mean by velocity of money ?
12. What is certificate of deposits ?
13. What is high-powered money ?
14. Define general crossing. What are its essentials ?
15. What is mutual fund ?

P.T.O.



16. Write a note on NEFT and IFSC.
17. List the various forms of money.
18. What do you mean by devaluation ?
19. What are basic lending principle ?
20. Explain CRR.
21. Explain equation of exchange.
22. What are different types of negotiable instruments ?

(8×2=16 Marks)

SECTION – III

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

23. Explain how supply of money depends up on the high powered money, the currency deposit ratio and cash reserve ratio.
24. Explain credit creation. Describe the factors which determine the volume of credit which can be created.
25. Write a note on telephone banking.
26. Explain the instruments of quantitative credit control policy.
27. Describe the role of non-banking financial institutions in Indian financial system.
28. Money is what money does. Discuss.
29. Give details of different types of cheque.
30. Explain Keynesian theory of demand for money.
31. Elucidate the functions of RBI.

(6×4=24 Marks)

SECTION – IV

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

32. "Computerization made revolutionary changes in modern banking". Comment.
33. Explain the functions of Commercial bank. Discuss the role of commercial bank in the economic development of India.
34. Briefly explain the recent reforms in Indian banking sector.
35. Define endorsement. Explain with illustrations the different kinds of endorsement and bring out their significance.

(2×15=30 Marks)



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Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2018

First Degree Programme under CBCSS

Open Course

EC 1551 : HUMAN RESOURCE MANAGEMENT

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Man Power Planning.
2. Labour Market
3. Internal sources of recruitment.
4. What do you understand by refresher training ?
5. Job forecasting.
6. H R Management
7. Human capital
8. Apprenticeship training
9. Demotion.
10. Industrial democracy.

(10×1=10 Marks)

SECTION – II

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

11. Briefly explain the objectives of HRM.
12. Distinguish between recruitment and selection.
13. HRIS
14. State the importance of selection.
15. What are the benefits of training ?
16. Explain labour theory of value.

P.T.O.



17. Difference between on the job and off the job training.
18. Types of discipline.
19. Explain the purpose of promotion.
20. Define separation.
21. Distinguish between layoff and retrenchment.
22. Job enrichment.

(8×2=16 Marks)

SECTION – III

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

23. Explain the different types of training.
24. What is meant by e-recruitment ? What are the advantages of e-recruitment ?
25. Explain the procedure for taking disciplinary action.
26. What are the pre-requisites for effective collective bargaining ?
27. Discuss the challenges and relevance of HRM.
28. Explain the trends in working age population in India.
29. Briefly explain the different sources of external recruitment.
30. What are the reasons for transfer ?
31. Explain the importance of industrial democracy.

(6×4=24 Marks)

SECTION – IV

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

32. Describe the various steps in selection process.
33. Explain the nature, scope and functions of Human Resource management
34. Explain the various factors affecting recruitment policy and programme.
35. Discuss the role of workers' participation in management in India.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

History

Core Course – X

HY 1545 – MAKING OF INDIAN NATION

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. Rowlat Act.
2. Safety-Valve Theory.
3. Partition of Bengal.
4. Bardoli Satyagraha.
5. Abhinav Bharat.
6. Simon Commission.
7. Intreme Government.
8. Kalpana Dutt.
9. Direct Action Day.
10. Annie Besant.

(10×1=10 Marks)

PART – B

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

11. Jallian Wallabagh Massacre.
12. Ilbert Bill Controversy.
13. Swaraj Party.
14. Malabar Rebellion.

P.T.O.

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15. Moderates.
16. Lucknow Pact.
17. RIN Mutiny.
18. Cripps Mission.
19. Gopala Krishna Gokhale.
20. Communal Award.
21. Quit India Movement.
22. Muhammed Ali Jinnah.

(8×2=16 Marks)

PART – C

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

23. Give a brief account of the Swadesi Movement.
24. Assess the formation of the Muslim League.
25. Explain the Women Revolutionary Movement.
26. Point out the Government of India Act of 1935.
27. Highlight the Trade Union Movement.
28. Write an account of the Non Co Operation Movement.
29. Discuss the Cabinet Mission Plan.
30. Evaluate the Integration of Indian States with Indian Union.
31. Trace the growth of Communalism in India.

(6×4=24 Marks)

PART – D

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

32. Analyse the formation of Indian National Congress with reference to its various phases.
33. Examine the role played by Gandhiji in India's Struggle for freedom.
34. Critically examine the role played by Subhash Chandra Bose and Indian National Army.
35. Dr. B. R. Ambedkar is considered as the Architect of Indian Constitution –
Comments.

(2×15=30 Marks)



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F – 2259

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme under CBCSS

Branch : Economics

EC 1541 – MICRO ECONOMICS II

(2013 & 2014 Admissions)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Market failure.
2. Product differentiation.
3. Duopoly.
4. Externalities.
5. Public good.
6. Marginal product.
7. Collective Bargaining.
8. Monopoly.
9. Pure strategy.
10. Risk.

(10x1=10 Marks)

SECTION – B

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

11. What do you mean by Quasi Rent ?
12. What is Nash Equilibrium ?
13. What do you mean by expected utility ?
14. Explain Welfare Economics.

P.T.O.



15. Define Pareto Optimality.
16. Elucidate Euler's Theorem.
17. Distinguish between positive externalities and negative externalities.
18. Explain Excess capacity.
19. Explain price discrimination.
20. Explain Social Welfare function.
21. What is meant by Economic Rent ?
22. Explain Free Rider's problem.

(8×2=16 Marks)

SECTION – C

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

23. Explain the three marginal conditions of Pareto Optimality.
24. Examine Ricardo's Rent theory.
25. Elucidate Marginal Productivity theory of distribution.
26. What are the basic characteristics of Oligopoly Market ?
27. Explain Prisoner's Dilemma.
28. Explain Cartel and Price leadership.
29. Examine the features of Monopolistic Competition.
30. Distinguish between mixed strategy and pure strategy.
31. What are the causes of Market failure ?

(6×4=24 Marks)

SECTION – D

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

32. Explain the determination of equilibrium price and quantity under Monopoly market.
33. Briefly explain Expected Utility theory.
34. Explain the short run and long run equilibrium condition of a firm under perfect competition.
35. Discuss the role of profit in a free market economy. Is there any conflict between profit earning and social welfare.

(2×15=30 Marks)



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F – 2264

Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2018

First Degree Programme Under CBCSS

Open Course

EC 1551 : HUMAN RESOURCE MANAGEMENT

(2013 and 2014 Admissions)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Human Resource Planning.
 2. Human capital.
 3. Personal Management.
 4. Promotion.
 5. Placement.
 6. Induction.
 7. Industrial relation.
 8. Recruitment.
 9. Management.
 10. Transfer.
- (10×1=10 Marks)**

SECTION – B

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

11. What are objectives Human Resource Management ?
12. Explain strategic Human Resource Management.
13. Define career planning.
14. Explain types of transfer.
15. Explain objectives of trade union.
16. Explain the features of collective bargaining.

P.T.O.



17. Distinguish between personal management and human resource management.
18. What are the types of training ?
19. What do you mean by job evaluation ?
20. What are different forms of employee separation ?
21. What are the objectives of human resource development ?
22. What are the sources of recruitment ?

(8×2=16 Marks)

SECTION – C

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

23. Elucidate various training techniques.
24. What are the various aspects of changing environment of Human Resource development ?
25. What are the different steps involved in selection process ?
26. Explain different steps of collective bargaining.
27. Describe various steps in induction programme.
28. Explain the need and significance of HR planning.
29. Describe the functions of personal management.
30. Examine the main problems of human resource planning process.
31. Examine the process of performance appraisal.

(6×4=24 Marks)

SECTION – D

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

32. Discuss the scope and functions of human resource management.
33. Discuss the importance and determinant of Industrial Relation.
34. Discuss the importance and process of Human Resource planning.
35. Examine the process of recruitment.

(2×15=30 Marks)



(Pages : 2)

F – 2344

Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2018
First Degree Programme Under CBCSS
Physical Education
Open Course
PE 1551 : HEALTH AND FITNESS EDUCATION
(2013 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

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

(10×1=10 Marks)

1. What is Dhronacharya award ?
2. Define doping.
3. What is Bow leg ?
4. List the criteria that decide the severity of burn.
5. What is speed endurance ?
6. Define Body composition.
7. Where is inter coastal muscle located ?
8. What do you mean by athletes heart ?
9. List the personal factors effecting health.
10. What is the aim of Physical Education ?

PART – B

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

(8×2=16 Marks)

11. What is the social dimension of health ?
12. How socio cultural factor effect health ? Describe.
13. Brief the causes of Diabetes Mellitus.
14. What is aerobic exercise ?

P.T.O.



15. List the ill effects of overuse of Television.
16. Write the benefits of exercise.
17. What is the difference between muscular strength and muscular endurance ?
18. Write the remedial measures for flat foot.
19. List the things to maintain hygiene
20. What is flexibility ? How it can be improved ?
21. Write a short note on Asian Games.
22. How does warm up help to perform better ?

PART – C

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

(6×4=24 Marks)

23. Write a short note on the harmful effects of alcohol.
24. How is physical education important to the present society ?
25. Why is recreation important for healthy living ? Discuss.
26. Differentiate between aerobic exercise and anaerobic exercise.
27. Write a short note on performance related fitness.
28. What is wellness ? How it can be improved?
29. Write the first aid measures to be followed for snake bite.
30. Define fracture. Discuss its management.
31. Write the remedial measures for Kyphosis.

PART – D

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

(2×15=30 Marks)

32. Explain the term health. Explain the dimensions of health.
 33. Describe health related fitness components. Explain the ways and means to develop these components.
 34. What is Hygiene ? Describe the types of hygiene and measures to keep it.
 35. Sport is an excellent media to empower women. Discuss.
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F – 2375

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

Economics

Core Course – VIII

EC 1543 : ECONOMICS OF GROWTH AND DEVELOPMENT

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Human Poverty Index.
2. Morbidity rate.
3. Capital Output Ratio.
4. Dualism.
5. Economic growth.
6. PQLI.
7. Golden Age.
8. SOC.
9. Below Poverty Line.
10. Innovation. (10×1=10 Marks)

SECTION – II

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

11. What is Development gap ?
12. What are various indicators of Development ?
13. Give an account of Adam Smith's theory of economic development.
14. Distinguish between absolute and relative poverty.

P.T.O.



15. What do you mean by economic inequality ?
16. Point out the properties of Lorenz curve.
17. Diagrammatically explain Kuznet's hypothesis.
18. Explain Happiness index.
19. Explain Gender Development Index.
20. What are 'shocks' according to Leibenstein ?
21. Explain poverty gap.
22. What do you mean by vicious cycle of Poverty ?

(8×2=16 Marks)

SECTION – III

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

23. Define the 'Big Push' theory.
24. What is Sen's Capability approach ?
25. Explain Critical Minimum Effort thesis.
26. Write a short note on social dualism.
27. Explain the Balanced theory of economic development.
28. Explain Myrdal's theory of circular causation.
29. Explain poverty gap index.
30. Give an account of Robert Solow's growth model.
31. Point out the main characteristics of LDC's.

(6×4=24 Marks)

SECTION – IV

Answer **any two** questions **not** exceeding **120** words. **Each** question carries **15** marks.

32. Explain Harrod-Domar growth model.
33. Discuss Lewis theory of unlimited supply of labour.
34. What is Gini coefficient ? Is this tool is a good one in measuring inequality ?
35. Explain Fei-Ranis model.

(2×15=30 Marks)



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F – 2377

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018
First Degree Programme Under CBCSS

Economics
Core Course X
EC 1545 : PUBLIC ECONOMICS
(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Externalities.
2. Club goods.
3. Incidence of tax.
4. Internal debt.
5. Deficit financing.
6. Revenue deficit.
7. Compensatory fiscal policy.
8. Fiscal imbalance.
9. Displacement effect.
10. VAT.

(10×1=10 Marks)

SECTION – II

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

11. Why is public sector needed in a national economy ?
12. What are merit goods ?
13. Distinguish between direct and indirect tax.
14. Explain the main sources of public debt.

P.T.O.

F – 2377



15. What is Contingency fund ?
16. Define the term Balanced Budget Multiplier.
17. State the difference between backward and forward shifting of tax.
18. Give an account of the various organs of local self government.
19. Define Ad Valorem tax.
20. What do you understand by free rider problem ?
21. Write a note on non tax revenue of government.
22. Distinguish between revenue budget and capital budget. (8×2=16 Marks)

SECTION – III

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

23. Write down the scope of Public Finance.
24. Explain Peacock and Wiseman hypothesis.
25. Examine the cannons of public expenditure.
26. Write down the various classification of public debt.
27. What do you understand by the term PPBS ? Explain.
28. Highlight the main features of good tax system.
29. Explain the sources of revenue of local bodies.
30. State the difference between positive and negative externalities with an example.
31. Discuss the various instrument of fiscal policy. (6×4=24 Marks)

SECTION – IV

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

32. Discuss Dalton's Principle of Maximum Social Advantage. Explain its limitations.
 33. What are the objectives of public expenditure ? Examine the causes for the growth of public expenditure in India.
 34. Explain the effects of taxation on production and distribution.
 35. Examine the main problems of federal finance. Discuss the various suggestions for improvement in federal financial relationship. (2×15=30 Marks)
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(Pages : 2)

F – 2571

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018
(Career Related First Degree Programme Under CBCSS)
Group – 2(a) : Malayalam and Mass Communication
Vocational Course – VIII

MX 1572 : INTRODUCTION TO TELEVISION PRODUCTION
(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. Answer the following in **one/two** sentences.

- 1) Character generator.
- 2) Tele prompter.
- 3) Cut away.
- 4) Sound bite.
- 5) Final Cut Pro.
- 6) Wipe.
- 7) OLED.
- 8) Sound mixer.
- 9) Rushes.
- 10) Depth of field.

(10×1=10 Marks)

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

- 11) Dissolve.
- 12) Microphone.
- 13) Analogue transmission.
- 14) Rule of thirds.
- 15) Linear editing.
- 16) Floor Manager.
- 17) Low angle shot.

P.T.O.



- 18) Story board.
- 19) White balance.
- 20) Continuity.
- 21) Promo.
- 22) Dubbing.

(8×2=16 Marks)

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

- 23) What are the similarities and differences in tilting and panning ?
- 24) Explain the lighting required for indoor and outdoor production.
- 25) Elaborate the important principles of sound mixing.
- 26) Describe the important types of microphones used in a TV studio.
- 27) Elaborate the various activities done at the pre-production stage.
- 28) Briefly explain the different camera angles.
- 29) What are the important lenses used in a TV camera ?
- 30) Define ELS and ECU. When do we use these shots ?
- 31) How does lighting contribute to the tone, texture and meaning of a TV production ?

(6×4=24 Marks)

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

- 32) Describe the various transition devices. When do we use these transitions in a programme ?
- 33) 'It's the video editor who converts the rushes into priceless gems.' Elaborate the work done at editing.
- 34) Elucidate the characteristics of TV and the challenges faced by this medium in the digital era.
- 35) Elaborate the equipment required for outdoor shooting.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(Career Related First Degree Programme under CBCSS)
Group 2(a) Botany and Biotechnology
BB 1552 : Food and Dairy Biotechnology
(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in a word or **one** of **two** sentences. (10×1=10 Marks)

1. Name any two major component of food.
2. Name an immunological method for the detection of microbial spoilage.
3. Give any one physical method for food preservation.
4. Name any mycotoxin.
5. Name two microbes involved in food spoilage.
6. Which organism is responsible for the fermentation of yogurt ?
7. Who invented pasteurization ?
8. Which toxin cause botulism ?
9. Which is the most common symptom associated with a foodborne illness ?
10. Name the carbohydrate present in the milk.

SECTION – B

Answer **any 8** questions. Answer **not** to exceed **one** paragraph. (8×2=16 Marks)

1. What are fermented foods ?
2. How can you prevent the outbreak of Staphylococcal intoxication ?
3. Brief the role of indicator organisms in food safety.
4. Is raw milk safe for drinking and why ?
5. Name two most common pathogenic bacteria that may found in spoiled meat.

P.T.O.



16. Explain the signs of spoiled food.
17. Give two examples of chemical food preservatives.
18. How the salt preserve food ?
19. What is resazurin test used for ?
20. Write down the principle behind irradiation as a food preservation method.
21. What is the principle behind the methylene blue test for milk quality ?
22. Name two fermented dairy products.

SECTION – C

Answer **any 6** questions. Answer **not** to exceed **half** page. (6×4=24 Marks)

23. Write briefly about the major sources of food contamination.
24. Explain the direct methods for the microbial evaluation of food.
25. Differentiate between food contamination and food spoilage.
26. Explain the role of refrigeration in preservation of food.
27. Explain the types spoilage occurring in canned foods.
28. Give the basic steps involved in the industrial cheese manufacture.
29. Give an account food irradiation.
30. Explain the pasteurization process.
31. Describe the microbial spoilage of fish.

SECTION – D

Answer **any 2** questions. Answer **not** to exceed **three** pages. (2×15=30 Marks)

32. Write an essay on various food-borne disease and intoxications.
 33. Explain the various food preservation techniques with the principles behind each of that.
 34. Explain the various spoilage conditions of milk and dairy products and the microbes responsible for it. Elaborate on milk borne illnesses.
 35. What are the different tests to access the quality of milk ? Explain the principle behind each method. What are the procedures ?
-



(Pages : 3)

F – 2252

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

HISTORY

Core Course – VII

**HY 1542 – Colonialism and Resistance Movements in India
(2013 Admission Onwards)**

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. Serampore
2. Fort St. David
3. Blue Water Policy
4. Ananda Ranga Pillai
5. Holwell
6. 'Sunset Law'
7. Dadni System
8. Fort William College
9. Jhalkari Bai
10. James Neil.

(10×1=10 Marks)

P.T.O.



PART – B

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

11. Asiatic Society of Bengal.
12. Battle of Colachel.
13. Pitt's India Act.
14. Charter Act of 1813.
15. Orientalist and Anglicist Controversy.
16. Vivian Derozio.
17. Commercialization of Agriculture.
18. *Sati*.
19. *Mahalwari* System.
20. Veluthambi.
21. Jambudwipa Proclamation.
22. Mangal Pandey.

(8×2=16 Marks)

PART – C

Answer **any six** of the following in **not** more than **120** words **each** carrying **four** marks.

23. Nationalist Historiography.
24. Battle of Buxar.
25. Doctrine of Lapse.
26. Regulating Act of 1773.
27. Causes for the decline of Traditional Crafts.



- 28. Widow Remarriage Act.
- 29. Santhal Rebellion.
- 30. Kattabomman.
- 31. Consequences of 1857 Revolt.

(6×4=24 Marks)

PART – D

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

- 32. Describe the Anglo-Mysore Wars.
- 33. Examine the development of education in India under East India Company rule.
- 34. Bring out the main features of Permanent Settlement system and trace its merits and demerits.
- 35. What was the nature of 1857 Revolt and assess the causes for its failure ?

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme under CBCSS

HISTORY

Core Course – VIII

HY 1543 – History of Modern World (Part – II)

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. Nazi Party
2. Young Italy
3. Hague Conference
4. Lateran Accord
5. Green backs
6. Clara Barton
7. Radical Republicans
8. Axis Powers
9. UNESCO
10. 'Four freedoms' of Roosevelt.

(10×1=10 Marks)



PART – B

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

11. Aims and objectives of The United Nations.

12. Treaty of Trianon.

13. Cavour and Italian unification.

14. Results of the American Civil War.

15. League Council.

16. Lincoln Douglas Debate.

17. Alliances in the First World War.

18. Character of Mussolini.

19. Emancipation Proclamation.

20. Austro-Prussian War.

21. The Fourteen points of Woodrow Wilson.

22. Impact of the Second World War.

(8×2=16 Marks)

PART – C

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

23. Describe the role played by of the League of Nations in bringing peace.

24. *Kulturkampf*.

25. The Young Turk Revolution in Turkey.

26. Germany's acceptance of Hitler as savior.

27. Analyse the peace Conferences after the Second World War.



28. Examine the Constitution of the United Nations.
29. Evaluate the role of Mazzini and Garibaldi in Italian unification.
30. Elaborate the provisions of the Munich Pact.
31. Describe the home policy of Benito Mussolini.

(6×4= 24 Marks)

PART – D

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

32. Analyse the Paris Peace Conference and Treaty of Paris.
33. How did the great depression affect the nations ?
34. Examine the role of the dictators in creating the Second World War.
35. Evaluate the policies of Adolf Hitler.

(2×15= 30 Marks)



(Pages : 3)

F – 2257

Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2018

First Degree Programme under CBCSS

Open Course – I

HY 1551.2 : INTRODUCTION TO ARCHAEOLOGY

(2013 Admission Onwards)

Max. Marks : 80

Time : 3 Hours

PART – A

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

1. Artifacts.
2. Carbon dating method.
3. Museums.
4. John Marshall.
5. Sir Alexander Cunningham.
6. Lothal.
7. Numismatics.
8. Inscriptions.
9. Excavations.
10. Archaeologist.

(10×1=10 Marks)

P.T.O.



PART – B

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

11. What is Ethno archaeology ?
12. What is the importance of Archaeology ?
13. How are stone tools made and for what uses ?
14. How Asiatic Society contributed to the Archaeological development ?
15. List the basic objectives of archaeological study.
16. What do we mean by archaeological survey ?
17. What are assemblages ?
18. How has Dendro chronology changed radiocarbon dating ?
19. How is archaeology useful in supporting national identity and cultural heritage ?
20. How can we reconstruct the life of the earliest human ancestors ?
21. What is the Pleistocene Period ?
22. Write a brief note on under water archaeology. (8×2=16 Marks)

PART – C

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

23. Discuss the nature and scope of archaeological studies.
24. Describe the relation between Archaeology and History.
25. Write a brief note on Neolithic Culture with reference to India.
26. Describe the importance of Pattanam excavation in the archaeological history of Kerala.



27. How do archaeologist determine the age of any findings such as pottery etc. ?
28. Explain briefly the different phases in Paleolithic Age.
29. Discuss the different types of archaeological dating.
30. Write a note on Geological time scale.
31. Briefly describe the relationship between archaeology and social sciences.
(6×4=24 Marks)

PART – D

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

32. Define archaeology in broadest term and explain the differences between different kinds of Archaeology.
 33. Debate and discuss the ethical aspects of archaeological research in relation to case study.
 34. Analyze the role and importance of museums for the preservation of archaeological heritage.
 35. Discuss the early characteristics of early Paleolithic, Neolithic and Megalithic cultures in India.
(2×15=30 Marks)
-



(Pages : 3)

F – 2260

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

Economics

Core Course – VII

EC – 1542 : MACRO ECONOMICS – II

(2013 Admn. and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Inflation.
2. Autonomous investment.
3. Consumption function.
4. Depreciation.
5. Accelerator.
6. Pigou effect.
7. Transfer payments.
8. Precautionary demand for money.
9. Stagflation.
10. APC and MPC.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Distinguish between gross and net investment.
12. What is natural rate of unemployment ?
13. Demand for money.
14. Distinguish between nominal and real rate of interest.
15. Consumption function.
16. Explain Fisher effect.
17. What is social cost of inflation ?
18. What are the different phases of a trade cycle ?
19. What is whole sale price index ?
20. Explain supply of money.
21. What is Liquidity Trap ?
22. What is classical dichotomy ?

(8×2=16 Marks)

SECTION – III

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

23. Explain relative income hypothesis.
24. Explain briefly the different types of inflation.
25. Explain fiscal policy.
26. Explain the concept of investment multiplier.
27. Explain super multiplier.



28. List out the factors affecting money supply in an economy.

29. What is H-theory of money supply ?

30. What is trade cycle ? How it can be controlled ?

31. Distinguish between real and nominal rate of interest.

(6×4=24 Marks)

SECTION – IV

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

32. Friedman's reformulation of Quantity Theory of Money (QTM) involves the inter-action of money, price level and rate of interest. Elucidate.

33. Explain Phillips curve.

34. Critically explain the Permanent Income Hypothesis.

35. What is monetary policy? What are its main instruments ?

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme under CBCSS

ECONOMICS

Core Course : VIII

**EC-1543 : Development Economics
(2013 Admn. and 2014 Admn.)**

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer in **one** or **two** sentences (Attempt **all** questions) :

1. Backward linkage.
2. Capital-output ratio.
3. Capital accumulation.
4. Economic growth.
5. Technical progress.
6. Positive sum incentives.
7. Infant mortality rate.
8. Warranted rate of growth.
9. Standard of living.
10. Zero sum incentives.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. What is growth agent according to Leibenstein ?
12. Explain the concept of foreword linkage.
13. What is division of labour ?
14. Explain the concept of SOC.
15. Explain stimulants.
16. Explain sustainable development.
17. Explain Gini Coefficient.
18. What is stimulant ?
19. Explain Human Deprivation Index.
20. Explain Lorenz curve.
21. Explain shocks.
22. Explain Surplus value. (8×2=16 Marks)

SECTION – III

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

23. What is balanced growth ?
24. Explain Schumpeter's concept of entrepreneurship.
25. Distinguish growth and development.
26. What is HDI ?
27. What are the different characteristics of LDCs ?
28. Discuss the development views of Joan Robinson.



29. Explain PQLI.

30. What is vicious circle of poverty ?

31. Explain the concept of indivisibilities.

(6×4=24 Marks)

SECTION – IV

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

32. Explain Harrod-Domar growth model.

33. Discuss the development views of Adam Smith.

34. Critically explain unlimited supplies of labour.

35. Explain the theory of unbalanced growth.

(2×15=30 Marks)



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F – 2263

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

ECONOMICS

Core Course : X

EC-1545 : Public Economics

(2013 Admn. & 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Externalities.
2. GST.
3. Market failure.
4. Fiscal policy.
5. Own Revenue.
6. Budget.
7. Public goods.
8. Market imperfections.
9. Direct tax.
10. Special assessments.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Distinguish between private finance and public finance.
12. Explain the concepts of impact and incidence of tax.
13. What are merit goods ?
14. What are the different sources of non-tax revenue ?
15. Explain proportional, progressive and regressive taxation.
16. Distinguish between developmental and non-developmental expenditure.
17. What do you mean by shifting of taxation ?
18. Explain cascading effect of tax.
19. Explain the concepts of deficit financing.
20. What do you mean by internal and external debt ?
21. Explain the working of Value Added Tax in avoiding the tax cascading effects.
22. Explain the concept of Taxable Capacity. **(8×2=16 Marks)**

SECTION – III

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

23. Evaluate the benefit theory of taxation.
24. Explain zero based budgeting.
25. Examine the reasons for the growth of public expenditure.
26. What are Adam Smith's canons of taxation ?
27. Explain Wagner's law of increasing state activities.



28. What are the methods of redemption of public debt ?
29. Examine the role of government in a modern economy.
30. Explain performance budgeting.
31. Explain the role of finance commission in maintaining centre state financial relations. (6×4=24 Marks)

SECTION – IV

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

32. Evaluate the ability to pay theory of taxation.
 33. Explain the economic effects of public expenditure on production, consumption and distribution.
 34. Critically evaluate the theory of maximum social advantage.
 35. Explain the nature, scope and significance of public finance. (2×15=30 Marks)
-



(Pages : 3)

F – 2374

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

First Degree Programme Under CBCSS

ECONOMICS

Core Course – VII

EC 1542 : Macro Economics – II

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Pigou effect
2. Transitory income
3. Keynesian consumption function
4. IS curve
5. Business cycle
6. Permanent income
7. Marginal efficiency of investment
8. Accelerator
9. Autonomous investment
10. Inflation.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Distinguish between MEC and MEI.
12. Define monetarism.
13. What are the factors that cause shift in LM curve ?
14. Give a short note on the concept of investment multiplier ?
15. What do you mean by Fisher effect ?
16. What are the subjective factors affect consumption function ?
17. Diagrammatically explain the effectiveness of fiscal policy in an IS-LM framework.
18. What do you mean by permanent income hypothesis ?
19. What do you mean by Stagflation ?
20. Explain the accelerator theory of investment.
21. Explain the major causes of business cycles.
22. What are the major effects of inflation on distribution ? **(8×2=16 Marks)**

SECTION – III

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

23. Explain the concept of liquidity trap.
24. What are the determinants of consumption function ?
25. Explain investment function.
26. What do you mean by real balance effect ?



27. Explain the concepts of inflationary gap.
 28. Explain the cash balance approach to the quantity theory of money.
 29. What are the main determinants of investment function ?
 30. Explain Hick's theory of trade cycles.
 31. What do you mean by MBA hypothesis ?
- (6×4=24 Marks)**

SECTION – IV

Answer **any two** questions **not** exceeding **120** words. **Each** question carries **15** marks :

32. Explain Hawtrey's theory of trade cycle.
 33. What do you mean by money and what are the main functions of money ?
 34. Explain IS-LM model.
 35. Critically examine Friedman's restatement of quantity theory of money.
- (2×15=30 Marks)**
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme under CBCSS

PHYSICS

Core Course V

PY 1541 : Classical Mechanics and Theory of Relativity

(2013 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

This Section contains very short answer questions of **one mark each**. Answer **all** questions.

1. State Newton's second law.
2. What is meant by the term homogeneity of space ?
3. Define a central force. Give an example.
4. Write down the relation connecting radius vector, linear momentum and angular momentum.
5. Give an example of a holonomic constraint.
6. Write down the relation between generalized co-ordinate and the conjugate momentum.
7. Write down the relation connecting Lagrangian and Hamiltonian.
8. What do you mean by the rest mass of an object ?
9. Name the experiment that confirmed the absence of an absolute rest frame.
10. What are tachyons ?

(10×1=10 Marks)

P.T.O.



SECTION – B

This Section contains short answer questions of **2 marks each**. (Answer **8** questions).

11. Write down the relation connecting torque and angular momentum and obtain the law of conservation of angular momentum.
12. What is meant by cyclotron frequency ? Write down the expression for the same.
13. Explain homogeneity of flow of time and conservation of energy.
14. What are the first integrals in central force problem ?
15. Distinguish between elastic and inelastic collisions.
16. What is meant by the term cross-section of scattering ?
17. Explain D'Alembert's principle.
18. Mention the situation for a system involving constraints, where Newtonian approach fails and Lagrangian approach provides solution.
19. Distinguish between inertial and non-inertial frames of references.
20. Discuss the effects of coriolis force as a result of earth's motion.
21. Write down the postulates of the special theory of relativity.
22. Discuss the absoluteness of simultaneity of two events occurring at the same point. **(8×2=16 Marks)**

SECTION – C

This Section contains short essay questions of **4 marks each**. (Answer **6** questions).

23. Calculate the reduced mass of CO molecule. Given $1 \text{ amu} = 1.67 \times 10^{-27} \text{ kg}$.
24. Check whether the force $F = (2xy + yz^2)\hat{i} + (x^2 + xz^2)\hat{j} + 2xyz\hat{k}$ is conservative or not.
25. A bullet of mass 10 gm strikes a ballistic pendulum of mass 2 kg. The centre of mass of the pendulum rises to a vertical height of 12 cm. Assuming that the bullet remains embedded in the pendulum, calculate its initial speed.



26. Obtain the Lagrangian for a system of two masses, connected by an inextensible string passing over a smooth frictionless pulley. Also write the Lagrange's equation of motion.
27. Setup the Hamiltonian for an ideal spring-mass arrangement and write down the Hamilton's equations of motion.
28. Prove that acceleration is invariant under Galilean transformations.
29. In a laboratory, the life-time of a particle moving with speed 2.8×10^8 m/sec is observed to be 2.5×10^{-7} sec. Determine the proper life-time of the particle.
30. Show that for a particle moving with velocity equal to that of light has zero rest mass.
31. Distinguish between space-like and time-like intervals. **(6×4=24 Marks)**

SECTION – D

This Section contains long essay questions of **15 marks each**. (Answer **2** questions).

32. Prove that a translational symmetry leads to conservation of linear momentum and rotational symmetry results in conservation of angular momentum.
 33. Deduce Kepler's laws of planetary motion.
 34. Derive Hamilton's equations of motion for a conservative system. Compare Newtonian, Lagrangian and Hamiltonian formalisms.
 35. Obtain Lorentz transformation equations for co-ordinates and time for two inertial frames. **(2×15=30 Marks)**
-



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F - 2394

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme under CBCSS

PHYSICS

Core Course – VI

PY 1542 : QUANTUM MECHANICS

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

This Section contains very short answer questions of **one mark each**.

Answer **all** questions.

1. Name the law that corresponds to the low frequency limit of Planck's distribution formula.
2. What is the relation between photoelectric current and light intensity ?
3. What is de Broglie's hypothesis ?
4. What is the quantum mechanical operator representing momentum ?
5. In hydrogen atom, what is the energy required for a transition of an electron from the innermost energy level to the first excited level ?
6. What is meant by a free particle ?
7. What are the eigenfunctions of a quantum harmonic oscillator ?
8. Give an example of a linear operator.
9. Write down the general eigenvalue equation.
10. What do you mean by orthogonal eigenfunctions ?

(10×1=10 Marks)

P.T.O.



SECTION – B

This Section contains short answer questions of 2 marks **each**.
(Answer 8 questions).

11. Why classical physics could not account for the spectral distribution of energy density of a black body ?
12. Write down Einstein's photoelectric equation and explain the terms involved.
13. What are Bohr's postulates with regard to hydrogen atom ?
14. What do you mean by the expectation value of an operator ? What is the expression for the same ?
15. What are the basic properties of stationary states ?
16. Discuss the position-momentum uncertainty principle.
17. Write down the admissible wavefunctions in different regions of a finite square well.
18. Explain why a quantum oscillator is found outside the parabolic potential barrier.
19. Can we measure the kinetic and potential energies of a particle simultaneously with arbitrary precision ? Justify the answer.
20. Explain :
 - i) Hermitian and
 - ii) Anti-Hermitian operators.
21. What do you mean by completeness of eigenfunctions ?
22. Illustrate what is meant by a delta function potential. **(8×2=16 Marks)**

SECTION – C

This Section contains short essay questions of 4 marks **each**.
(Answer 6 questions).

23. The photoelectric threshold for a material is $3000 \text{ \AA}$. Determine the kinetic energy of an electron emitted from it by a radiation of wavelength $1000 \text{ \AA}$.



24. Determine the de Broglie wavelength of an electron accelerated through a potential difference of 100 V.
 25. An eigen function of the operator $\frac{d^2}{dx^2}$ is e^{2x} . Find the corresponding eigen value.
 26. A 1 kw radio transmitter operates at a frequency of 880 kw. How many photons does it emit per second ?
 27. The average life time of an excited atomic state is 10^{-9} s. If the spectral line associated with the decay of this state is $6000 \text{ \AA}$, determine the width of the line.
 28. Obtain the expectation value of the momentum of a particle enclosed in a one-dimensional box.
 29. Normalize the wavefunction $\Psi(x) = e^{\frac{-x}{a}}$.
 30. Prove that the eigenvalues of Hermitian operators are real.
 31. Prove that commuting operators have common set of eigenfunctions.
- (6×4=24 Marks)**

SECTION - D

This Section contains long essay questions of **15 marks each**.
(Answer 2 questions).

32. What is Compton effect ? Obtain an expression for the Compton shift using conservation laws based on quantum theory.
 33. Setup the time-dependent Schrödinger equation for a free particle. What are its solutions ? Write down the normalized wavefunction for a free particle.
 34. Write down the Schrödinger equation for a particle confined to an infinite square well. Obtain the eigenfunctions and eigenvalues.
 35. Discuss the generalised statistical interpretation. Prove the generalized uncertainty principle.
- (2×15=30 Marks)**
-



(Pages : 3)

F – 2398

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme under CBCSS

PHYSICS

Open Course

PY 1551.2 : Astronomy and Astrophysics

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Name the nearest star to our Sun.
2. Name the galaxy to which we belong to
3. What is Hubble's distance ?
4. By which name is the first aeon of cosmic time is known ?
5. Which fundamental property of a star fixes its life style ?
6. What is the other name for radiation remaining from Big Bang ?
7. What is schwarzschild radius ?
8. Name any two planets of solar system which do not have a natural satellite.
9. What is the meaning of the sentence "The Earth has prograde rotation' ?
10. Name the planet that has the Greek name of the Roman God of war.

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. How could modern astronomy predict the existence of Neptune before it was discovered ?
12. Astronomy is by and large an observational science. Comment on this statement.
13. What is meant by the geocentric model of the Universe ? Why did it fail ?
14. What change do you expect in a mass of a body when it is accelerated to the speed of light ?
15. What is meant by Pogsen ratio ?
16. Distinguish between brightness and luminosity of a star.
17. What are the two major types of telescopes we use in astronomy ?
18. Name three major types of galaxies.
19. What is a neutron star ?
20. What is sidereal year ?
21. What is meant by escape velocity of a planet ?
22. How does modern science account for the sudden disappearance of dinosaurs from the earth ?

(8×2=16 Marks)

SECTION – C

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

23. What is meant by power of a lens ? How is it calculated ?
24. How do inflation model accounts for the missing of monopole in this universe ?



25. At a temperature above 10^{31} Kelvin all the four forces of nature becomes indistinguishable. Explain why ?
26. What are constellations ? Give two examples.
27. What are main sequence stars ?
28. What do you know about Supernova Explosion ?
29. Though Venus is twice far away from the sun than mercury, average surface temperature of Venus is more than that of Mercury. Why ?
30. What are sun spots ?
31. What are the co-ordinates used in equatorial system of co-ordinates ?
(6×4=24 Marks)

SECTION – D

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

32. What is meant by rate of expansion of the Universe ? How it leads us to different models of the Universe ?
 33. Explain structure of the Sun. What is the source of energy of the Sun ?
 34. Write short note on Comet, Asteroids and meteoroids bringing out the difference between them.
 35. Starting from Roman Calendar, describe the evolution of present day Gregorian-Calendar.
(15×2=30 Marks)
-



(Pages : 3)

F – 2402

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

(First Degree Programme under CBCSS)

CHEMISTRY

Core Course – V

CH 1541 : Physical Chemistry – I

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Define mean free path.
2. Arrange most probable velocity, average velocity and RMS velocity in the increasing order of magnitude.
3. The total number of Bravais lattices is _____
4. A plane cuts the a, b and c axes at 2a, 3b and c. Find the Miller indices of the plane.
5. Solutions having same osmotic pressure are called _____
6. One mole of an ideal gas at 0°C (volume 22.4 l) undergoes expansion against a constant pressure of 1 atm. The final volume is 224 l. The work done is _____ l atm.
7. During Joule-Thomson expansion, _____ remains constant.
8. According to Maxwell's relation $\left(\frac{\partial P}{\partial T}\right)_V =$ _____.
9. BF_3 belongs to _____ point group.
10. The two planes in water molecule are _____ (vertical, horizontal, one vertical and one horizontal)

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. Write Maxwell's distribution of molecular velocity. Represent it graphically. What is the effect of temperature on the distribution ? Explain.
12. Calculate most probable velocity for O_2 at $0^\circ C$.
13. What are the Bravais lattices under cubic system ? Find the number of atoms per unit cell in each of them.
14. KCl belongs to fcc. But XRD pattern of KCl resembles simple cubic. Why ?
15. 54.18 g of glucose ($M = 180$ g) is dissolved in water and made up to 1000 ml. Find the osmotic pressure of the solution $T = 298$ K.
16. Define inversion temperature. Explain its significance.
17. What is the effect of temperature on the viscosity of liquids ? Explain.
18. State and explain Hess's law.
19. Free energy functions are better criteria than entropy in predicting spontaneity. Why ?
20. What is the effect of
 - a) P
 - b) T on Gibb's free energy ? Explain.
21. Explain with example improper rotation axis.
22. Define liquid crystals. How are they classified ?

(8×2=16 Marks)

SECTION – C

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

23. Calculate the number of collisions per m^3 per sec. for O_2 at $0^\circ C$ and 1 bar pressure. Diameter of O_2 is 0.36 nm.
24. Define critical constants. Show that $T_c = \frac{8a}{27Rb}$ (a, b – Vander Waals constants).



25. The diffraction patterns of a cubic system are shown in $\sin\theta$ values of 0.1461, 0.1690, 0.2801, 0.2935 and 0.3697. Find the lattice type. Justify your answer.
26. Derive Poiseuille's equation. Discuss.
27. Show that $\bar{C}_p - \bar{C}_v = R$ for ideal gas.
28. Derive Kirchhoff's equation.
29. Derive Gibb's Helmholtz equation.
30. Define partial molal volume. How is it determined ? Discuss with the help of one example.
31. Discuss Swarm theory of liquid crystals. (6×4=24 Marks)

SECTION – D

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

32. a) Define fugacity. How is it determined ? Discuss.
b) Derive Gibbs-Duhem equation.
33. a) Define Vant Hoff's factor. How is it determined in cryoscopy ?
b) Derive equations for Δu , ΔH , ΔS , ΔA and ΔG for adiabatic expansion.
34. Write a brief account of
a) rotating crystal method
b) powder method in crystallography.
35. Discuss briefly
a) Virial equation of state
b) Non-stoichiometric defect
c) Joule Thomson effect. (2×15=30 Marks)
-



(Pages : 3)

F – 2403

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

(First Degree Programme Under CBCSS)

CHEMISTRY

Core Course – VI

CH 1542 : Inorganic Chemistry – III

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all**, **each** carries **1** mark.

1. The number of unpaired electrons in Fe^{2+} is _____
2. The general electronic configuration of inner transition metal is _____
3. In the octahedral ligand field theory, the 3d orbitals will split into _____ levels.
4. The hybridisation of XeF_6 is _____
5. The number of bridging CO present in $\text{Mn}_2(\text{CO})_{10}$ is _____
6. Give an example for hexadentate ligand.
7. What is the co-ordination number of Cr in $\text{NH}_4[\text{Cr}(\text{NH}_3)_2(\text{NCS})_4]$?
8. The purple colour of KMnO_4 is due to _____
9. Maximum oxidation number of Os is _____
10. The groups satisfying the secondary valencies of a cation in a complex are called _____

(10×1=10 Marks)

P.T.O.



SECTION – B

Answer **any 8**, **each** carries **2** marks.

11. Zn^{2+} salts are colourless. While Cu^{2+} salts are blue why ?
12. Why do transition metal form coloured compounds ?
13. The radii of elements from Cr to Cu are very close to one another. Why ?
14. How haemoglobin differ from myoglobin ?
15. Explain why palladium does not readily form stable carbonyl clusters like Ni and Pt unless stabilised by σ donor ligands like phosphine.
16. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is blue colour while CuSO_4 is colourless. Why ?
17. What is an ambidentate ligand ? Give examples.
18. Zn, Cd and Hg are not considered as transition metals. Why ?
19. A complex having scandium in +3 oxidation state was found colourless. Why ?
20. What is inorganic benzene ? How is it prepared ?
21. What is the EAN of palladium in tetra chloro palladium (II) ion ?
22. Explain the term haptically with an example.

(8×2=16 Marks)

SECTION – C

Answer **any 6**, **each** carries **4** marks.

23. Explain why :
 - a) Transition metal forms alloys with other transition elements
 - b) Why do transition metals form coloured compounds ?
24. Explain why Cu, Ag and Au, Zn, Cd and Hg have lower melting point than other transition metals.
25. Explain why $[\text{CoF}_6]^{3+}$ is paramagnetic while $[\text{Co}(\text{NH}_3)_6]^{3+}$ is diamagnetic.



26. Discuss the functions of haemoglobin and myoglobin.
27. What are inorganic polymers ? Write a note on their structure and applications.
28. Magnetic moment of $[\text{MnCl}_4]^{2-}$ is 5.92 BM. Explain giving reason.
29. Why are d block elements called transition elements ? Give their important characteristics.
30. Explain why $[\text{CoF}_6]^{3-}$ is paramagnetic while $[\text{Co}(\text{NH}_3)_6]^{3+}$ is diamagnetic.
31. What are silicones ? Give their preparation and uses.

(6×4=24 Marks)

SECTION - D

Answer **any 2**, each carries **15** marks.

32.
 - a) Write a note on the structure of ferrocene.
 - b) Explain the synthetic application of Ziegler-Natta catalyst.
33. State a reason for the following :
 - a) The molecular shape of $[\text{Ni}(\text{CO})_4]$ is not the same as that of $[\text{Ni}(\text{CN})_4]^{2-}$.
 - b) CO is a stronger complexing reagent than NH_3 .
34.
 - a) What are inter halogens ? Discuss the preparation and structure of any four inter halogen compounds.
 - b) What are carboranes ? How are they obtained ?
35. Write a note on function and mechanism of dioxygen binding of haemoglobin and myoglobin.

(2×15=30 Marks)



(Pages : 3)

F – 2405

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(First Degree Programme Under CBCSS)

Chemistry

Open Course – I

IC 1551.1/CH 1551.1 : ESSENTIALS OF CHEMISTRY

(Common for Group 2(a) Chemistry and Industrial Chemistry 2013 Admn. Onwards and Chemistry 2013 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. How many electrons can be accommodated in an orbital ?
2. What happens for the atomic mass of a nuclide when it decays by β -emission ?
3. What is the disease caused by the deficiency of Vitamin A ?
4. Write the ground state orbital electronic configuration of nitrogen atom.
5. Give an example for a thermoplastic.
6. Give an example for an antiseptic.
7. What is the monomer of natural rubber ?
8. Name the lowest layer of atmosphere.
9. What is the half-life period of C^{14} isotope ?
10. Which nucleic acid contains thymine ?

(10×1=10 Marks)

P.T.O.



SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks.

11. What is meant by the term electron affinity ?
12. Define valency.
13. What are the uses of teflon ?
14. What are the n , l and m values of an electron in the $3p_x$ orbital ?
15. How terylene is produced ?
16. What are vitamins ?
17. What is meant by half life period of a radio isotope ?
18. What is a soap ?
19. What is natural radioactivity ?
20. Define the term COD.
21. What is an enzyme ?
22. What are antipyretics ?

(8×2=16 Marks)

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks.

23. Discuss Hund's rule with suitable examples.
24. Explain the cleansing action of soap.
25. Explain hardness of water.
26. Explain group displacement law.
27. What are sex hormones ? Explain their functions.
28. Distinguish between cationic and anionic detergents? Illustrate with examples.



29. Explain the classification of enzymes.
30. What are the applications of synthetic rubber ?
31. Explain greenhouse effect and global warming.

(6×4=24 Marks)

SECTION – D

Answer **any 2** questions. **Each** question carries **15** marks.

32. Explain
- i) Classification of dyes.
 - ii) Water quality parameters.
 - iii) Ozone umbrella.
33. Give an account on
- i) Pauli's exclusion principle.
 - ii) Quantum numbers.
 - iii) Electronegativity.
34. Discuss about
- i) Nuclear fusion.
 - ii) Radio carbon dating.
 - iii) Radioactive decay series.

35. Discuss about the classification of polymers.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
First Degree Programme Under CBCSS
Mathematics
Core Course
MM 1541 : REAL ANALYSIS – I
(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – 1

All the first 10 questions are compulsory. They carry 1 mark each.

1. Define ε -nbd of $a \in \mathbb{R}$.
2. If $S = \left\{ \frac{1}{n} - \frac{1}{m} : n, m \in \mathbb{N} \right\}$, find $\inf S$.
3. Give an example of a set in $\mathbb{R}$ such that its infimum exists but has no upper bounds.
4. State Archimedean Property.
5. Give an example of a bounded sequence which is not convergent.
6. What is the limit of the sequence $\left\{ \left(1 + \frac{1}{n} \right)^n : n \in \mathbb{N} \right\}$?
7. Define a contractive sequence of real numbers.
8. Find $\lim \left(\frac{2n}{n^2 + 1} \right)$.
9. State necessary condition for convergence of a series.
0. Define signum function. Is the sequence $(\text{sgn}(x_n))$ converges ?

P.T.O.



SECTION – 2

Answer **any 8** questions from this Section. **Each** question carries **2** marks.

11. State order properties of $\mathbb{R}$.
12. State and prove Triangle Inequality.
13. Determine the set $A = \left\{ x \in \mathbb{R} : \frac{2x+1}{x+2} < 1 \right\}$.
14. If $S = \left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$ then show that $\inf S = 0$.
15. Show that a convergent sequence of real numbers is bounded.
16. Show that a sequence in $\mathbb{R}$ can have at most one limit.
17. Show that $\lim_{n \rightarrow \infty} \left(\frac{\sin n}{n} \right) = 0$.
18. Show that the sequence $\left(\frac{1}{n} \right)$ is a Cauchy sequence.
19. Show that the series $\sum_{n=1}^{\infty} \frac{1}{n^2 - n + 1}$ is convergent.
20. Show that $\lim_{x \rightarrow 0} \left(x \sin \frac{1}{x} \right) = 0$.
21. Show that $\lim_{x \rightarrow 0} \frac{1}{x}$ does not exist in $\mathbb{R}$.
22. Show that $\lim_{x \rightarrow 0} \frac{1}{x^2} = \infty$.

SECTION – 3

Answer **any 6** questions from this Section. **Each** question carries **4** marks.

23. State and prove Density Theorem.
24. Show that if A and B are bounded subsets of $\mathbb{R}$, then $A \cup B$ is a bounded set and $\sup(A \cup B) = \sup\{\sup A, \sup B\}$.
25. State and prove Squeeze Theorem for sequence of real number.
26. State and prove Bolzano-Weierstrass Theorem.
27. Show that the series $\sum_{n=1}^{\infty} \frac{1}{n}$ is divergent.



28. Show that the series $\sum_{n=1}^{\infty} \frac{1}{n!}$ is convergent.
29. If $f : A \rightarrow \mathbb{R}$ and if c is a cluster point of A , then show that f can have only one limit at c .
30. Show that the p-series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ converges when $p > 1$.
31. Let $f(x) = e^{1/x}$ for $x \neq 0$. Show that the right-hand limit of $f(x)$ does not exist but the left hand limit exist and equal to 0.

SECTION – 4

Answer **any 2** questions from this Section. **Each** question carries **15** marks.

32. Show that there exists a positive real number x such that $x^2 = 2$.
33. i) State and prove Nested Intervals Property of real numbers.
ii) State and prove Monotone convergence theorem.
34. i) Show that a sequence of real numbers is convergent if and only if it is a Cauchy sequence.
ii) Show that every contractive sequence is a Cauchy sequence and is convergent.
35. i) Show that the geometric series $\sum_{n=1}^{\infty} r^n$ converges when $|r| < 1$.
ii) State and prove sequential criterion theorem.
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
First Degree Programme under CBCSS
MATHEMATICS
Core Course V
MM 1542 : Complex Analysis – I
(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Express $\frac{(5+i)(2-i)}{(1-i)}$ in the form $a + ib$.
2. Find the square roots of -1 .
3. Show that $\operatorname{Im} z = \frac{z - \bar{z}}{2i}$.
4. Represent geometrically $\{z / z = \bar{z}\}$.
5. Find $|e^{2i}|$.
6. Define an entire function.
7. Express $-1 + i$ in polar form.
8. Define a region in a complex plane.
9. Define radius of convergence of a power series.
10. Write the power series expansion of e^{4z} .

SECTION – II

Answer any 8 questions from among the questions 11 to 22. They carry 2 marks each.

11. Find the sum of the complex numbers $3 - i$ and $1 + i$ geometrically.
12. Find the cube roots of $8i$.

P.T.O.



13. State and prove the necessary and sufficient condition for $\{z_n\}$ to converge.
14. Use Cauchy-Riemann equations to verify whether $x^2 + y^2 - 2xyi$ is analytic.
15. Does the series $\sum_{k=1}^{\infty} \frac{1}{k+i}$ converge or diverge. Justify your answer.
16. Prove that an analytic function with constant real part is a constant.
17. Evaluate $\int_C \frac{1}{z} dz$ where $C : z(t) = r \cos t + i r \sin t, 0 \leq t \leq 2\pi, r \neq 0$.
18. Evaluate $\int_C (x^2 + iy^2) dz$ where $C : z(t) = t^2 + it^2, 0 \leq t \leq 1$.
19. Find the unique real solution of $x^3 + 6x = -20$ using cubic method.
20. Is the polynomial $x^3 + 3xy^2 - x + i(3x^2y + y^3 - y)$ analytic? Justify your answer.
21. Can a non-constant analytic polynomial be real valued?
22. Define a smooth curve.

SECTION – III

Answer **any 6** questions from among the questions **23 to 31**. They carry **4 marks each**.

23. Geometrically represent the following sets.
 - a) $\left\{ z : \frac{-\pi}{4} < \arg z < \frac{\pi}{4} \right\}$
 - b) $\{ z : |z - 1| < 2 \}$
24. Prove $|z_1 + z_2|^2 + |z_1 - z_2|^2 = 2(|z_1|^2 + |z_2|^2)$.
25. If $\sum_{n=0}^{\infty} a_n z^n$ and $\sum_{n=0}^{\infty} b_n z^n$ converge and agree on a set of points with an accumulation point at the origin then $a_n = b_n$ for all n .
26. Find the radius of convergence of $\sum_{n=0}^{\infty} [1 + (-1)^n]^n z^n$
27. Prove that $\int_{-C} f = - \int_C f$.
28. State and prove Closed Curve Theorem.



29. a) Evaluate $\int_C (z - 2i) dz$ where C is $z(t) = t + it^2$, $-1 \leq t \leq 1$.
b) Also find the above integral along the straight line from $-1 + i$ to $1 + i$.
30. a) Show that there are no analytic function $f = u + iv$ with $u(x, y) = x^2 + y^2$.
b) Prove that $|e^z| = e^x$.
31. Suppose f is an entire function of the form $f(x, y) = u(x) + iv(y)$. Show that f is a linear polynomial.

SECTION – IV

Answer **any 2** questions from among the questions 32 to 35. They carry **15 marks each**.

32. Suppose $\lim_{k \rightarrow \infty} |C_k|^{1/k} = L$, prove that
- If $L = 0$, $\sum_{k=0}^{\infty} C_k z^k$ converges for all z .
 - If $L = \infty$, $\sum_{k=0}^{\infty} C_k z^k$ converges for $z = 0$ only.
 - If $0 < L < \infty$, set $R = \frac{1}{L}$, then $\sum_{k=0}^{\infty} C_k z^k$ converges for $|z| < R$ and diverges for $|z| > R$.
33. a) Prove that a power series is differentiable and derive the formula for its derivatives.
b) Prove that if $f(z) = \sum_{n=0}^{\infty} c_n z^n$ has a non-zero radius of convergence, then
- $$c_n = \frac{f^{(n)}(0)}{n!} \text{ for all } n.$$
34. a) Show that the function $f(x, y) = \frac{xy(x - iy)}{x^2 + y^2}$, $z \neq 0$ and $f(0) = 0$ satisfies
- C. R equations at origin but it is not differentiable at origin.
- Suppose C is a smooth curve of length L , f is continuous on C and that $f < M$ throughout C . Then Prove that $\int_C f(z) dz < ML$.
35. State and prove Integral Theorem.
-



(Pages : 3)

F – 2469

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme under CBCSS

MATHEMATICS

Core Course VIII

MM 1545 : Abstract Algebra – I

(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

All the first 10 questions are compulsory. They carry 1 mark each.

1. Check whether addition of matrices is a binary operation on the set of all matrices with real entries.
2. Let F be the set of all functions f mapping $\mathbb{R}$ into $\mathbb{R}$ that have derivatives of all orders. Check whether $\phi : (F, +) \rightarrow (F, +)$ defined by $\phi(f) = f'$ is an isomorphism.
3. Show that the binary structure $(M_2(\mathbb{R}), \cdot)$ of 2×2 real matrices with usual matrix multiplication is not isomorphic to $(\mathbb{R}, \cdot)$.
4. Check whether $\mathbb{Z}^+$ under multiplication is a group.
5. Does there exist a non-abelian group of order 7. Give reasons.
6. How many subgroups are there for $\mathbb{Z}_{30}$?
7. What is the maximum number of elements there for a cyclic group G with only one generator, where $G \neq \{e\}$?
8. Show by an example that every proper subgroup of a non-abelian group may be abelian.
9. Find the orbits of the permutation $\sigma : \mathbb{Z} \rightarrow \mathbb{Z}$ given by $\sigma(n) = n + 2$.
10. Find the index of $\langle \mu_1 \rangle$ in the group S_3 .

P.T.O.



PART - B

Answer **any eight** questions from this Part. **Each** question carries **two** marks.

11. Prove that the binary structure $\langle M_2(\mathbb{R}), \cdot \rangle$ of 2×2 real matrices with the usual matrix multiplication is not isomorphic to $\langle \mathbb{R}, \cdot \rangle$ with the usual matrix multiplication.
12. Determine whether the set of all $n \times n$ matrices with determinant -1 is a subgroup of $GL(n, \mathbb{R})$.
13. True or False : Every group of order ≤ 4 is cyclic. Justify.
14. Prove that if $a \in G$, the subgroups generated by a and a^{-1} are the same.
15. Prove that every cyclic group is abelian.
16. Prove that the collection of all even permutations of $\{1, 2, 3, \dots, n\}$ form a subgroup of order $\frac{n!}{2}$ of the symmetric group S_n .
17. Compute $\tau^2\sigma$ in S_6 where $\tau = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 4 & 1 & 3 & 6 & 5 \end{pmatrix}$ and $\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 3 & 1 & 4 & 5 & 6 & 2 \end{pmatrix}$.
18. What is the order of the permutation ?
 $(1\ 2\ 4)(3\ 5\ 7\ 8)$.
19. Prove that every group of prime order is cyclic.
20. Does there exist a subgroup of a group of order 6 whose left cosets give a partition of the group into 12 cells ?
21. Let G be a group and let H be a subgroup of G . Let $a, b \in G$. Prove that the number of elements in aH is the same as the number of elements in bH .
22. Find a generator of $\mathbb{Z}_2 \times \mathbb{Z}_3$.

PART - C

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

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



24. Describe all the elements in the cyclic subgroup of $GL(2, \mathbb{R})$ generated by the 2×2 matrix.
- $$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$$
25. Let G be a cyclic group with generator a , and let G' be a group isomorphic to G . If $\phi: G \rightarrow G'$ is an isomorphism, show that for every $x \in G$, $\phi(x)$ is completely determined by the value of $\phi(a)$.
26. Describe the sub-group diagram for the dihedral group D_4 .
27. Show that a cycle of length n has order n .
28. Let H be a subgroup of G . Let the relation $\sim_L$ be defined on G by $a \sim_L b$ iff $a^{-1}b \in H$. Show that $\sim_L$ is an equivalence relation.
29. State and prove Lagrange's theorem for groups.
30. Show that if G is a group of even order, then it has an element $a \neq e$ satisfying $a^2 = e$.
31. Show that every permutation σ of a finite set is a product of disjoint cycles.

PART - D

Answer **any two** questions from this Part. **Each** question carries **15** marks.

32. Describe the group U_n and $GL(n, \mathbb{R})$ with their properties.
33. Prove that a subgroup of a cyclic group is cyclic.
34. State and prove Cayley's theorem.
35. The group $\mathbb{Z}_m \times \mathbb{Z}_n$ is cyclic and is isomorphic to $\mathbb{Z}_{mn}$ iff m and n are relatively prime.
-



(Pages : 3)

F – 2470

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme under CBCSS

PHYSICS

Core Course V

PY 1541 – Methodology in Physics and Relativistic Mechanics

(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is the role of experimentation in scientific method ?
2. Define generalized momentum.
3. Give the Hamiltonian for a two dimensional harmonic oscillator.
4. Write down Hamilton's equations of motion.
5. What is meant an inertial frame ?
6. State the postulates of special theory of relativity.
7. What is meant by rest energy ?
8. Explain what is meant by length contraction.
9. Write down the relativistic energy – momentum relation.
10. What are tachyons ?

(10×1=10 Marks)

P.T.O.



SECTION – B

Answer **Eight** questions **not** exceeding a paragraph. **Each** question carries **two** marks :

11. What is quantitative approach of research ?
12. What are the three groups in to which different methods of research can be put ?
13. Give the different criteria to be satisfied by a good scientific research.
14. What are the two types of experiments ?
15. What are cyclic coordinates ? Prove that the momentum conjugate to a cyclic coordinate is a constant of motion.
16. Give the conditions under which the hamiltonian function becomes the total energy of a system.
17. Write down the Galilean transformation equations.
18. Discuss the importance of the Michelson-Morley experiment.
19. Using energy-momentum relation, prove that a particle of zero rest mass always travel with the speed of light in vacuum.
20. Explain twin paradox.
21. Define the components of velocity four-vector.
22. Discuss how the time dilation of special relativity was tested experimentally.

(8×2=16 Marks)

SECTION – C

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

23. Discuss the general objectives of research.
24. Describe the different steps of scientific research.
25. Explain the concept of replication in the design of experiments.



26. In an experiment to determine the spring constant, the following values are obtained for the spring constant (in Newton/metre) : 86, 85, 84, 89, 85, 89, 87, 85, 82, 85.
- Find the mean value of spring constant.
 - Standard deviation of the values.
27. Prove that Hamiltonian function is a constant of motion if the Lagrangian is not an explicit function of time.
28. Write down the Hamiltonian for a one dimensional harmonic oscillator and obtain the equations of motion.
29. What is Coriolis force ? How does it affect motion of objects on earth ?
30. Calculate the apparent wavelength of a spectral line of wavelength $5000\text{\AA}$ in the light coming from a distant star which moves away from the earth at a recessional velocity of $3 \times 10^7 \text{ m/s}$.
31. Calculate the velocity of nuclear particles whose mean life time is $4.17 \times 10^{-8}\text{s}$.
Proper life time is $2.5 \times 10^{-8}\text{s}$. (6×4=24 Marks)

SECTION – D

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

32. Discuss statistical testing of a hypothesis explaining null hypothesis, significance level in the statistics based acceptance or rejection of a hypothesis.
33. Describe the importance of estimating errors. Discuss random errors and systematic errors and their sources.
34. Outline the general format of a science journal paper with proper description of each component.
35. Using the conservation of momentum, arrive at the relativistic expression for variation of mass with velocity. (2×15=30 Marks)
-



(Pages : 3)

F – 2527

Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2018
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)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What do you mean by credit rating ?
2. Distinguish between cumulative and non-cumulative preference shares.
3. What is meant by 'Greenshoe option' ?
4. What is FPO ?
5. What is rights issue ?
6. What is DVR ?
7. What is meant by G-secs ?
8. What is private placement ?
9. What is sweat equity ?
0. What is ASBA ?

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. Write a brief note on leading stock market indices in India.
12. What do you mean by 'buy back' of shares ?
13. Distinguish between Money market and Capital market.
14. Differentiate between Red Herring Prospectus and Abridged Prospectus.
15. What is dematerialization ?
16. What is book building ?
17. Distinguish between rights issue and bonus issue.
18. Distinguish between repo and reverse repo.
19. What do you mean by Blue Chip Stock ? Give an example.
20. What is Short Selling ? Give an example.
21. What is Insider Trading ?
22. Distinguish between ADR and GDR.

(8×2=16 Marks)

SECTION – C

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

23. Distinguish between a bank and a depository.
24. Describe the differences between Primary market and Secondary market.
25. Explain the role of merchant bankers in public issue.
26. What are the benefits of depositories ?
27. What are the functions of SEBI in securities market ?



28. Which are the fraudulent and unfair trade practices common in the stock markets ? Briefly explain.
29. What are the advantages of futures trading ?
30. What are the advantages of listing of securities ?
31. What is the role of stock exchanges in an economy ? (6×4=24 Marks)

SECTION – D

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

32. Explain the important components of the Indian financial system.
33. Describe the major functions performed by the financial system in an economy.
34. What do you mean by a financial derivative ? Explain different types of financial derivatives.
35. What do you mean by clearing and settlement ? Explain the process and agencies involved in clearing and settlement. (15×2=30 Marks)
-



(Pages : 3)

F – 2568

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

Career Related First Degree Programme Under CBCSS

MALAYALAM AND MASS COMMUNICATION

Core Course

MX 1541 : Nadodi Vijnaneeyam

നാടോടി വിജ്ഞാനീയം

(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ പരമാവധി രണ്ടു വാക്യത്തിലോ ഉത്തരമെഴുതുക.

- 1) ജനകീയ പഴമയ്ക്ക് പകരം ഫോക്ലോർ എന്ന പദം ആദ്യമായി നിർദ്ദേശിച്ചതാര് ?
- 2) ദി ഡിക്ഷണറി ഓഫ് ഫോക്ലോർ മിത്തോളജി ആൻഡ് ലജൻഡ് എന്ന കൃതി എഡിറ്റ് ചെയ്തതാര് ?
- 3) Who are the Folk ? എന്ന പഠനം തയ്യാറാക്കി പ്രസിദ്ധീകരിച്ച അമേരിക്കൻ പണ്ഡിതനാര് ?
- 4) അനുഷ്ഠാന സിദ്ധാന്തത്തിന്റെ വക്താവാരാണ് ?
- 5) ലോകത്തിലെ എല്ലാ കഥകളിലും കൂടി മൂപ്പത്തി ഒന്ന് വ്യത്യസ്ത ഏകകങ്ങളെ (Functions) ഉള്ളൂവെന്ന് വാദിച്ച പണ്ഡിതനാര് ?
- 6) ഭദ്രകാളിയെ പ്രീതിപ്പെടുത്തുന്നതിനായി തിരുവിതാംകൂർ, കൊച്ചി പ്രദേശങ്ങളിൽ നടത്തി വരുന്ന അനുഷ്ഠാന കലാരൂപമേത് ?
- 7) ഫോക് എന്ന പദത്തിന്റെ അർത്ഥമെന്താണ് ?
- 8) ഇക്കോ ഫോക്ലോർ എന്ന ആശയം മുന്നോട്ടു വച്ചതാരാണ് ?
- 9) 'ഫോക്ലോറിന് ഒരു പഠന പദ്ധതി' ആരുടെ കൃതിയാണ് ?
- 10) കാർഷിക സംസ്കാരവുമായി ബന്ധപ്പെട്ട ഏതെങ്കിലും രണ്ട് ഉത്സവങ്ങളുടെ പേരെഴുതുക.

(10x1=10 Marks)

P.T.O.



II. ഒരു ഖണ്ഡികയിൽ കവിയാതെ എട്ടു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 11) ഫോക്ലോർ നിർവചനം.
- 12) വ്യാപന സിദ്ധാന്തം ലക്ഷ്യം വയ്ക്കുന്നതെന്താണ് ?
- 13) മെറ്റാഫോക്ലോർ.
- 14) പടയണി.
- 15) മാർഗ്ഗംകളി.
- 16) നാട്ടാചാരങ്ങൾ.
- 17) നാടൻ ഭക്ഷണം.
- 18) ഇക്കോ-ഫോക്ലോർ.
- 19) മുഗാരാധന.
- 20) നാടോടി നാടകങ്ങൾ.
- 21) സാമുദായിക ഗാനങ്ങൾ.
- 22) ഫോക്ലോറിസം.

(8×2=16 Marks)

III. ഒരു പുറത്തിൽ കവിയാതെ ആറ് ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) ഫോക്ലോർ എന്ന പദം ഒരേ സമയം പഠനവിഷയത്തെയും പഠനവസ്തുവിനെയും സൂചിപ്പിക്കുന്നുവെന്ന് പറയാൻ കാരണമെന്ത് ?
- 24) ആദ്യകാല ഫോക്ലോർ നിർവചനങ്ങൾ അധികവും നാടൻ സാഹിത്യത്തിലും കലയിലും മാത്രം ഉന്നൽ നൽകാൻ കാരണമെന്ത് ?
- 25) മാക്സ് മുള്ളറുടെ സൗരപുരാവൃത്തസിദ്ധാന്തം വ്യക്തമാക്കുക.
- 26) കെട്ടുമുറ സിദ്ധാന്തം എന്നാലെന്ത് ? നാടോടി പാട്ടുകളെ അപഗ്രഥിക്കുന്നതിൽ ഈ സിദ്ധാന്തം എത്രത്തോളം സഹായകമാണെന്ന് പരിശോധിക്കുക.
- 27) ഫോക്ലോർ പഠനത്തിൽ ഫീൽഡ് വർക്കിന്റെ പ്രാധാന്യവും ആവശ്യകതയും എന്താണ് ?
- 28) പ്രായോഗിക ഫോക്ലോർ എന്നാലെന്ത് ? വിശദമാക്കുക.



- 29) കടങ്കഥകളുടെ സവിശേഷതകൾ സംഗ്രഹിക്കുക.
- 30) നാടൻപാട്ടുകളെ വർഗീകരിച്ച് വിശദീകരണക്കുറിപ്പ് തയ്യാറാക്കുക.
- 31) നാടൻ പാചകവിദ്യയെക്കുറിച്ചുള്ള പഠനം 'നാടോടി സംസ്കാരത്തിന്റെ പല മണ്ഡലങ്ങളിലേയ്ക്കും പരിതാക്കളെ എത്തിക്കും' – വിശദീകരിക്കുക.

(6×4=24 Marks)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ രണ്ടു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 32) ഫോക്ലോറിന്റെ അടിസ്ഥാനപരമായ സവിശേഷതകൾ വിശകലനം ചെയ്യുക.
- 33) നാട്ടറിവുകളുടെ ഏതെങ്കിലും മൂന്ന് വ്യത്യസ്ത ജനുസ്സുകളെ പരിചയപ്പെടുത്തി വിശദീകരണക്കുറിപ്പ് തയ്യാറാക്കുക.
- 34) ഫോക്ലോറിന് ഇതര വിഷയങ്ങളുമായുള്ള ബന്ധം വിശകലനം ചെയ്യുക.
- 35) 'ഫോക്ലോറിന്റെ നാനാത്വത്തിലാണ് ആധുനിക ഫോക്ലോർ പഠനത്തിന്റെ ഊന്നൽ' – വിശദമാക്കുക.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018

Career Related First Degree Programme Under CBCSS

MALAYALAM AND MASS COMMUNICATION

Core Course

MX 1542 : Kerala Samskaram Bhagam – II

കേരള സംസ്കാരം ഭാഗം – II

(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ പരമാവധി രണ്ടു വാക്യത്തിലോ ഉത്തരമെഴുതുക.

- 1) വാസ്കോഡ ഗാമയെ ഇന്ത്യയിലേയ്ക്കയച്ച പോർച്ചുഗൽ രാജാവാര് ?
- 2) ഉദയം പേരൂർ സുന്നഹദോസ് നടന്ന വർഷം ഏത് ?
- 3) പോർട്ടുഗീസുകാരുടെ കച്ചവടകുത്തകയെ വെല്ലുവിളിച്ചു കൊണ്ട് കടന്നു വന്ന വിദേശ ശക്തിയേത് ?
- 4) 'കേരളാരാമം' എന്നു കൂടി അറിയപ്പെടുന്ന സന്യാസാശ്രമഗ്രന്ഥമേത് ?
- 5) ആറ്റിങ്ങൽ കലാപം നടന്ന വർഷം ?
- 6) മലയാള ഭാഷയിൽ ആദ്യമായി അച്ചടിച്ച ഗ്രന്ഥം ഏത് ?
- 7) തിരുവിതാംകൂർ സർവകലാശാല സ്ഥാപിതമായതെന്ന് ?
- 8) ഗുരുവായൂർ സത്യാഗ്രഹ സംഘത്തിന്റെ വാളന്റിയർ ക്യാപ്റ്റൻ ആരായിരുന്നു ?
- 9) ക്ഷേത്രപ്രവേശന വിളംബരം പുറപ്പെടുവിച്ച തിരുവിതാംകൂർ രാജാവ് ആര് ?
- 10) സാധുജന പരിപാലന സംഘം സ്ഥാപിച്ചതാര് ?

(10×1=10 Marks)

P.T.O.



II. ഒരു ഖണ്ഡികയിൽ കവിയാതെ ഏതു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 11) കൂനൻകുരിശു കലാപം.
- 12) വേലുത്തമ്പി ദളവ.
- 13) സംക്ഷേപവേദാർത്ഥം.
- 14) ചാന്നാർ ലഹള.
- 15) മലയാളി മെമ്മോറിയൽ.
- 16) അയ്യങ്കാളി.
- 17) ഉണ്ണിനമ്പൂതിരി.
- 18) സമസ്ത കേരള സാഹിത്യപരിഷത്ത്.
- 19) അഷ്ടവൈദ്യന്മാർ.
- 20) കേരള പത്രിക.
- 21) നീലക്കുയിൽ.
- 22) കേരള കലാമണ്ഡലം.

(8×2=16 Marks)

III. ഒരു പുറത്തിൽ കവിയാതെ ആറു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) പോർട്ടുഗീസുകാർ വളർത്തിയെടുത്ത രാഷ്ട്രീയ അനൈക്യമാണ് കേരളത്തിൽ പിൻക്കാലത്തുണ്ടായ രാഷ്ട്രീയ ശൂന്യതയ്ക്ക് കാരണമായി തീർന്നത് - വിശകലനം ചെയ്യുക.
- 24) പോർട്ടുഗീസുകാരിൽ നിന്നും വ്യത്യസ്തമായ ഒരു നയമാണ് ഡച്ചുകാർ ഇന്ത്യയിൽ സ്വീകരിച്ചത് - പരിശോധിക്കുക.
- 25) കേരളത്തിൽ ബ്രിട്ടീഷ് അധികാരത്തിനെതിരെയുണ്ടായ ആദ്യത്തെ സംഘടിത പ്രക്ഷോഭമായിരുന്നു ആറ്റിങ്ങൽ കലാപം - വിലയിരുത്തുക.
- 26) പാശ്ചാത്യ വിദ്യാഭ്യാസം കേരളത്തിൽ ആരംഭിക്കുന്നത് ക്രിസ്ത്യൻ മിഷണറിമാരുടെ പ്രവർത്തനങ്ങളിൽ കൂടിയാണ് - പരിശോധിക്കുക.
- 27) വൈക്കം സത്യാഗ്രഹം നവോത്ഥാന പ്രസ്ഥാനങ്ങളിൽ നിന്നു ഭേദഗിയ പ്രസ്ഥാനത്തിലേയ്ക്കുള്ള കാൽവെയ്പായിരുന്നു. വിശദീകരിക്കുക.



28) അവർണ്ണ വിഭാഗക്കാർ സാമൂഹ്യ സമന്വയത്തിനുവേണ്ടി തുടങ്ങാനിരുന്ന വമ്പിച്ച പ്രക്ഷോഭത്തിന്റെ മുന്നോടിയായിരുന്നു ഈഴവ മെമോറിയൽ - പരിശോധിക്കുക.

29) എസ്. എൻ. ഡി. പി. യോഗത്തിന്റെ പ്രധാന ലക്ഷ്യങ്ങൾ എന്തൊക്കെയാണിരുന്നു ?

30) കേരളത്തിലെ ഭൂപരിഷ്ക്കരണ നിയമങ്ങളുടെ ചരിത്രം സംക്ഷേപിക്കുക.

31) ആധുനിക കേരളീയ പരിസരത്തിൽ ഇന്റർനെറ്റ് ചെലുത്തിയ സ്വാധീനം വിലയിരുത്തുക.

(6×4=24 Marks)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ രണ്ട് ചോദ്യത്തിന് ഉത്തരം എഴുതുക.

32) വിദ്യാഭ്യാസ സാംസ്കാരിക രംഗത്ത് പോർട്ടുഗീസുകാർ കേരളത്തിന് നൽകിയ സംഭാവനകൾ വിലയിരുത്തുക.

33) പഴശ്ശി രാജാവിന്റെ ചരിത്രം മൈസൂരിന്റെ സ്വേച്ഛാധിപത്യ പ്രവണതയോടും ബ്രിട്ടീഷുകാരുടെ അധികാര വിപ്ലവീകരണ ശ്രമങ്ങളോടും നിരന്തരമായി നടത്തിയ ദ്വിമുഖ പ്രതിരോധത്തിന്റെ കഥയാണ് - വിശദീകരിക്കുക.

34) കേരളത്തിലെ സാമൂഹ്യ പരിഷ്ക്കരണ പ്രസ്ഥാനങ്ങളിൽ വച്ച് ഏറ്റവും ശ്രദ്ധേയമായത് അയിത്തോച്ചാടന പ്രക്ഷോഭണമായിരുന്നു - വിശകലനം ചെയ്യുക.

35) നവമാധ്യമങ്ങൾ കേരളീയ സാമൂഹ്യരംഗങ്ങളിൽ ഉണ്ടാക്കിയ പരിവർത്തനങ്ങൾ വിമർശനാത്മകമായി വിലയിരുത്തുക.

(2×15=30 Marks)



(Pages : 3)

F – 2570

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2018 .
Career Related First Degree Programme Under CBCSS
MALAYALAM AND MASS COMMUNICATION
Core Course – IX

MX 1543 : Nadakom, Charithram, Padam, Prayogam

നാടകം, ചരിത്രം, പാഠം, പ്രയോഗം
(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ പരമാവധി രണ്ട് വാക്യത്തിലോ ഉത്തരമെഴുതുക.

- 1) 'രംഗഭാഷ' എന്ന നാടക ലക്ഷണഗ്രന്ഥം എഴുതിയതാര് ?
- 2) ധ്വനിസിദ്ധാന്തം അവതരിപ്പിച്ചതാര് ?
- 3) മലയാളത്തിലെ ആദ്യത്തെ രാഷ്ട്രീയ നാടകമേത് ?
- 4) യോഗക്ഷേമസഭയുടെ മുഖപത്രമായിരുന്ന മാസിക ഏത് ?
- 5) മാനുഷി എന്ന സ്ത്രീ വിമോചന സംഘടന അവതരിപ്പിച്ച ആദ്യത്തെ നാടകമേത് ?
- 6) ഏത് നാടകസംഘടനയാണ് 'കാഞ്ചനസീത്' എന്ന സി. എൻ നാടകം ആദ്യമായി അവതരിപ്പിച്ചത് ?
- 7) 'അവനവൻകടമ്പ' എന്ന നാടകം രചിച്ചതാര് ?
- 8) ദുരന്തനാടകത്തിലെ നായകന് നൽകുന്ന സ്വഭാവവൈകല്യത്തിന്റെ പേരെന്ത് ?
- 9) സ്ത്രീമനസ്സുകളിൽ കുടിയേറിയ നിരർത്ഥകമായ സൗന്ദര്യസങ്കല്പങ്ങളെ വിമർശിക്കുകയും വിശകലനം ചെയ്യുകയും ചെയ്യുന്ന സജിതാമഠത്തിലിന്റെ നാടകമേത് ?

10) മലയാളത്തിലെ ആദ്യത്തെ ഗദ്യപ്രഹസനമേത് ?

(10×1=10 മാർക്ക്)

P.T.O.



II. അരപുറത്തിൽ കവിയാതെ എട്ടു ചോദ്യങ്ങൾക്ക് ഉത്തരമെഴുതുക.

- 11) ലഘുകുറിപ്പ് തയ്യാറാക്കുക - 'സംഗീതനാടകങ്ങൾ'.
- 12) താര്യത്രികം എന്നാൽ എന്ത്?
- 13) 'നാടകഭാഷ' എന്നതുകൊണ്ട് ഉദ്ദേശിക്കുന്നതെന്ത്?
- 14) "എന്നെ ഞ്ഞുകൊണ്ടോ? കൊള്ളാം ഞ്ഞുകൊണ്ട് പുറപ്പെട്ടിരിക്കുന്ന കേമി"
- ആരുടെ വാക്കുകൾ? ഇതിലൂടെ വ്യക്തമാക്കുന്നതെന്ത്?
- 15) രാമായണനാടകത്രയം എന്നറിയപ്പെടുന്ന നാടകങ്ങൾ ഏതെല്ലാം? ആരുടെ രചനയാണവ?
- 16) പ്രഹസനം എന്നാൽ എന്ത്?
- 17) നാടകത്തിന്റെ അടിസ്ഥാന സവിശേഷതകൾ വ്യക്തമാക്കുക.
- 18) നാട്യധർമ്മി, ലോകധർമ്മി എന്നിവ വിശദീകരിക്കുക.
- 19) എൻ. കൃഷ്ണപിള്ളയെ മലയാളത്തിലെ ഇബ്സൻ എന്ന് വിളിക്കാനുള്ള കാരണമെന്ത്?
- 20) വിഭാവം എന്നാൽ എന്ത്?
- 21) നാടകാസ്വാദനം വഴി ലഭിക്കുന്ന പ്രയോജനങ്ങൾ ഏതെല്ലാം?
- 22) തെയ്യം എന്ന കലാരൂപത്തിന്റെ സാമാന്യസ്വഭാവം വ്യക്തമാക്കുക.

(8×2=16 മാർക്ക്)

III. നൂറ്റിയിരുപതു വാക്കിൽ കവിയാതെ 6 ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) എപ്പിക് തിയേറ്റർ - വിശദീകരിക്കുക.
- 24) 'സ്വത്വം നഷ്ടപ്പെടുന്ന സ്ത്രീ പ്രതീകങ്ങളാണ് പങ്കജവും ശാരദയും. അതിൽ പങ്കജം മോചിതയാകുന്നു. ശാരദ മരണപ്പെടുന്നു' - സ്വാഭിപ്രായം വ്യക്തമാക്കുക.
- 25) 'ചവിട്ടുനാടകം' - പ്രസക്തിയും പ്രാധാന്യവും ചർച്ച ചെയ്യുക.
- 26) രംഗവേദിയുടെ കേരളീയത 'ദൈവത്താർ' എന്ന കാവ്യാലം നാടകത്തെ ശ്രദ്ധേയമാക്കുന്നു - വിലയിരുത്തുക.



- 27) 'കുറുപ്പില്ലാക്കളരി' എന്ന പ്രഹസനം ഇന്നത്തെ കേരളീയ സമൂഹത്തിൽ പ്രസക്തമോ ? ചർച്ച ചെയ്യുക.
- 28) "ബഹുകാര്യ വ്യഗ്രനാണ് പുരുഷൻ. സ്ത്രീസാന്നിദ്ധ്യം പുരുഷനെ ഓർമ്മിപ്പിക്കേണ്ടതു സ്ത്രീ തന്നെയാണെന്ന് നീ മറക്കരുത്" - ആരുടെ വാക്കുകൾ ? ഈ വാക്കുകളുടെ പൊരുളെന്ത് ?
- 29) കേരളത്തിലെ സ്ത്രീനാടകവേദിയുടെ രൂപപ്പെടലിനെ സ്വാധീനിച്ച ഘടകങ്ങൾ എന്തെല്ലാം ?
- 30) കഥകളിയുടെ നാട്യാംശത്തെ പരിചയപ്പെടുത്തുക.
- 31) 'തെരുവുനാടകം കേരളത്തിൽ' - ലഘുപന്യാസം തയ്യാറാക്കുക. (6×4=24 മാർക്ക്)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ ഉത്തരമെഴുതുക (രണ്ടെണ്ണം).

- 32) 'മൽസ്യഗന്ധി' എന്ന നാടകത്തെ ആസ്പദമാക്കി മലയാള സ്ത്രീ നാടകവേദിയുടെ സമകാലികസ്ഥിതി - വിശകലനം ചെയ്യുക.
- 33) കാവാലം നാടകങ്ങളുടെ സൃഷ്ടിയിൽ തെളിഞ്ഞുനിൽക്കുന്നത് കേരളത്തിന്റെ തനതായ കലാപാരമ്പര്യമാണ് - 'ദൈവത്താർ' എന്ന നാടകത്തെ മുൻനിർത്തി അപഗ്രഥിക്കുക.
- 34) 'ജീവിതത്തിന്റെ നിഗൂഢമായ അന്തർധാരകളെ മനസ്സിലാക്കാൻ പ്രേക്ഷകനെയും വായനക്കാരനെയും സഹായിക്കുന്ന മലയാളത്തിലെ ലക്ഷണമൊത്ത ശോകനാടകങ്ങളിൽ ഒന്നാണ് കാഞ്ചനസീത്' - ഡോ. കെ. അയ്യപ്പപണിക്കരുടെ ഈ വിലയിരുത്തലിന്റെ സാധ്യത പരിശോധിച്ച് ഉപന്യാസം തയ്യാറാക്കുക.
- 35) മലയാള നാടകവേദിക്ക് പ്രൊഫസർ. എൻ. കൃഷ്ണപിള്ള നൽകിയ സംഭാവനകൾ വിലയിരുത്തുക. (2×15=30 മാർക്ക്)



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Reg. No. :

Name :

**Fifth Semester B.A. Degree Examination, December 2018
(Career Related First Degree Programme under CBCSS)
Group 2(a)**

MALAYALAM AND MASS COMMUNICATION

Open Course

**MX 1551.1 : Film Appreciation
(2014 Admission onwards)**

Time : 3 Hours

Max. Marks : 80

Write answer in **one** word or maximum **two** sentences to the following :

(10×1=10 Marks)

1. Talkies
2. Certification of Film
3. Censor Board
4. Dadasaheb Phalke Award
5. Parallel Cinema
6. Neo realism
7. Scene
8. Frame
9. Bollywood
10. Box office.

P.T.O.



Write short answers to **any eight** questions. **Each** in about **60** words : **(8×2=16 Marks)**

11. Process shot
12. New generation films
13. Establishing shot
14. Cross cutting
15. Key lighting
16. Dolly shot
17. Composition
18. Crane shot
19. Steadicam shot
20. Short films
21. Narrative
22. Mise en Scene.

Give short essay type answer to **any six** question :

(6×4=24 Marks)

23. How do you see film as a mass medium ?
24. Films can create social change in society. Discuss.
25. Delineate surrealism in films.
26. What are the important aspects to be considered in the pre production stage of a film ?
27. How does location become an important aspect of film narration ?
28. 'Film is more like Talkies rather than realism'. Discuss.



29. What is L cut and straight cut ?
30. What are the key aspects in Film Appreciation ?
31. What is the creative use of light ?

Write long essays to **any two** questions :

(2×15=30 Marks)

32. Prepare a pre production check list for a short campus film.
33. Explain the important camera shots and transition techniques used in film.
34. Examine the role and relevance of documentary films.
35. Write a brief profile of **any four** film director :

- a) S. Shankar
 - b) Ram Gopal Varma
 - c) ManiRathnam
 - d) M. T. Vasudevan
 - e) Adoor Gopalakrishnan
 - f) Nishikant Kamat – Drishyam
 - g) Anjali Menon – Bangalore days
 - h) Anwar Rasheed – Usthad hotel.
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(Career Related First Degree Programme under CBCSS)
BB 1552/BV 1552 – FOOD AND DAIRY BIOTECHNOLOGY
Common For Group 2 (a) Botany and Biotechnology
(2013 and 2014 Admn.) and Group 2 (b) : Biotechnology (Multimajor)
(2013 Admn Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION –A

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

1. HACCP
2. Tempeh
3. Kefir
4. Radicidation
5. Pascalization
6. Radurization
7. Halodurics
8. Dinitrosyl ferrohemochrome
9. Perigo factor
10. Maillard reaction.

(10×1=10 Marks)

P.T.O.



SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks. (Answer **not** to exceed **one** paragraph.)

11. Differentiate psychrophiles and psychrotrophs.
12. Name the methods for the treatment of water to make it potable.
13. What do you mean by class I preservatives ? Give example.
14. What are antioxidants ? Give example.
15. Explain drum drying process.
16. What do you mean by cryogenic freezing ?
17. Write a note on high pressure technology.
18. Name some molds useful in food industry.
19. What you mean by fermentation ? Give example of a fermented food.
20. Name any two bacteria and two molds involved in spoilage of meat.
21. Differentiate yeasts and mold.
22. Name any three viruses associated with food poisoning. **(8×2=16 Marks)**

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks. (Answer **not** to exceed **120** words.)

23. Explain the canning of foods.
24. What are the functions of food packaging ?
25. Differentiate toned milk and double toned milk.



26. What is food intoxication ? Give an example.
27. What is sauerkraut ? Describe the process involved in the production of sauerkraut.
28. How is skim milk power different from whole milk powder ?
29. Explain food poisoning caused by *C. botulinum*.
30. Describe spoilage of egg.
31. Explain preservation by high temperature. (6×4=24 Marks)

SECTION – D

Answer **any 2** questions. **Each** question carries **15** marks. (Answer **not** to exceed **three** pages.)

32. Write an essay on fermentative production of acetic acid.
 33. Elaborate the techniques used to detect microbial contamination of food.
 34. Enlist the sources of food contamination. Describe food spoilage by different organisms.
 35. Discuss the characteristics of mushrooms which make them a healthy food.
Discuss the cultivation of oyster mushrooms. (2×15=30 Marks)
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(Career Related First Degree Programme Under CBCSS)
Group 2(a) : Botany and Biotechnology
BB 1541 : PLANT PHYSIOLOGY
(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What do you mean by Transpiration ?
2. What do you mean by Glycolysis ?
3. What is Guttation ?
4. What are Gibberellins ?
5. What do you mean by Photorespiration ?
6. What is Hill reaction ?
7. What is Vernalization ?
8. What do you mean by Circadian rhythm ?
9. Expand RuBisCO.
10. What is Photo periodism ?

(10×1=10 Marks)



SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks. Answer **not** to exceed **one** paragraph.

11. Give a note on Mass flow hypothesis.
12. Differentiate between Nitrification and Denitrification.
13. Differentiate between imbibition and osmosis.
14. What do you mean by Donnan equilibrium ?
15. Differentiate between C₃ and C₄ plants.
16. How Nastic movements differ from Tropic movements ?
17. Give as short note on the Rotation of Crops.
18. What do you mean by Respiratory Quotient ?
19. What is Plasmolysis ? Mention its importance.
20. What are essential elements ? Name them.
21. What are the major plant enzyme groups ? Mention their functions.
22. What do you mean by Hydroponics ? **(8×2=16 Marks)**

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks. Answer **not** to exceed **120** words.

23. Discuss the factors affecting water potential.
24. What is diffusion ? What is its significance ? What are the factors influencing the rate of diffusion ?
25. Give a note on Cyclic and Non-cyclic photophosphorylation.
26. Which are the factors affecting transpiration ?
27. Write an account of anaerobic respiration.
28. What is plant senescence ? What is its significance ?
29. Differentiate between Photosystems I and II.
30. Describe the characteristics of C₄ plants.
31. Describe the various phases involved in the growth of a plant. **(6×4=24 Marks)**



SECTION - D

Answer **any 2** questions. **Each** question carries **15** marks. Answer **not** to exceed **3** pages

32. Describe where the various plant hormones are synthesized and what their functions are.
 33. Describe the source, functions and deficiency symptoms of essential elements.
 34. What is Krebs's cycle ? Describe the processes involved with an illustration.
 35. Describe the processes involved in the Nitrogen cycle. **(2×15=30 Marks)**
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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(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 **(10×1=10 Marks)**
1 mark.

1. Distinguish between Scorpioid and Helicoid cyme.
2. What is exalbuminous seed ?
3. What is meant by zygomorphic flower ?
4. Define herbarium.
5. What is natural system of classification ?
6. Describe the stamens of Annonaceae.
7. Describe the gynoecium of Cucurbitaceae.
8. Describe Pollinium.
9. Write on the placentation of Solanaceae.
10. Name one sugar yielding plant from Poaceae.

P.T.O.



SECTION - B

Answer **any 8** questions. Each question carries **two** marks. (Answer **not** to exceed **one** paragraph). (8×2=16 Marks)

11. Describe spikelet.
12. What is Cyathium inflorescence ?
13. What are the androecial characters of Asteraceae ?
14. What is artificial system of classification ? Give one example.
15. What are the components of a floral formula ?
16. What is chemotaxonomy ?
17. Describe the fruit of Citrus.
18. Write on the important floral features of Amaranthaceae.
19. What are the characteristic features of leaves and androecium of Myrtaceae ?
20. What are the uses of Herbarium ?

SECTION - C

Answer **any six** questions. Each question carries **4** marks. Answer **not** to exceed **120** words. (6×4=24 Marks)

21. Mention the Vegetative features of Nymphaeaceae.
22. Define spadix. Give one example.
23. Write a brief account on ICBN.
24. Write on the floral features of Apocynaceae.
25. With the help of diagrams describe the various aestivations studied by you.
26. What is the importance of botanical gardens ?



27. Write on the floral characters of Malvaceae.
28. Illustrate and describe Hypanthodium.
29. Write an account on Numerical taxonomy.
30. Write on the economic importance of Poaceae.
31. What are the floral characters of Apiaceae ? Add a note on its economic importance.

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks. Answer **not** to exceed **three** pages : (2×15=30 Marks)

32. List out the salient features of Orchidaceae and mention its advanced features.
 33. Describe the Bentham and Hookers system of classification in detail.
 34. Writing examples, describe the classification of fruits.
 35. Describe the economic importance of Leguminosae.
-



(Pages : 3)

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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

(Career Related First Degree Programme Under CBCSS)

Group 2(a) : BOTANY AND BIOTECHNOLOGY

BB 1571 : Recombinant DNA Technology

(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 **one** mark. **(10×1=10 Marks)**

1. What are plasmids ?
2. What is the function of DNA ligase ?
3. What is the importance of *matK* gene in plant systematics ?
4. What are nucleotides ?
5. Define transformation.
6. Expand AFLP.
7. Name the bacteria from which *Taq* DNA polymerase was isolated.
8. Define electrophoresis.
9. What is a thermal cycler ?
10. What is meant by reverse transcription ?

P.T.O.



SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks. Answer **not** to exceed **(8×2=16 Marks)** one paragraph.

11. What is immunoblotting ? Give one application.
12. Give a brief description of Nested PCR.
13. Comment on the importance of alkaline phosphatase in genetic engineering.
14. Write a short note on Green Fluorescent Protein.
15. What is DNA barcoding ?
16. What are the salient features of M13 cloning vector ?
17. What are competent cells ? What is its importance ?
18. Write a brief note on cos sites.
19. Give any two ethical issues of genetic engineering.
20. Give the advantages of cDNA library.
21. Differentiate between introns and exons.
22. Comment on annealing in PCR.

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks. (Answer **not** to exceed **120** words). **(6×4=24 Marks)**

23. Describe the construction of genomic DNA library.
24. Write a note on RFLP analysis.
25. Describe the qualities of an ideal plasmid cloning vector.
26. What are DNA microarrays ? How is it useful in gene expression analysis ?
27. Explain the organization of pBR322. Add a note on recombinant screening in this vector.



28. Describe the procedure of Southern blotting.
29. Write a note on blue-white screening.
30. Write a brief description of restriction endonucleases and its classification.
31. Give a description of Human Genome Project highlighting the goals.

SECTION – D

Answer **any 2** questions. **Each** question carries **15** marks. (Answer **not** to exceed **three** pages). **(2×15=30 Marks)**

32. Explain the different methods for vectorless gene transfer.
 33. What is DNA sequencing ? Describe the Maxam and Gilbert's method and Sanger's method of DNA sequencing.
 34. Write notes on (a) Gene therapy (b) YAC (c) RAPD.
 35. Explain the application of genetically modified organisms in the field of agriculture and medicine citing examples.
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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(Career Related First Degree Programme Under CBCSS)
Group 2(a) Botany and Biotechnology
BB 1573 : ANIMAL BIOTECHNOLOGY
(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is meant by secondary cell culture ?
2. What is a cell strain ?
3. Name two commonly used human cell lines.
4. Name the first drug produced through mammalian cell culture.
5. What is meant by transformed cell lines ?
6. What is boiling point of Liquid Nitrogen ?
7. What is Factor VIII ?
8. Which is the most commonly used animal in transgenic experiments ?
9. What is the purpose of adding glucose to the tissue culture media ?
10. Which is the most commonly used cryo-protectant ?

(10×1=10 Marks)



SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks. (Answer **not** to exceed **one** paragraph)

11. Define embryonic stem cells.
12. What is an immortalized cell line ?
13. What is gene therapy ?
14. What is the procedure for reviving cryopreserved cells ?
15. What are roller bottles ?
16. What is the role of fetal bovine serum in cell culturing media ?
17. Write a note on cryopreservation of animal cell cultures.
18. Write a brief note on cell viability assay.
19. Write briefly about the most important properties of a stem cell.
20. Differentiate between autograft and allograft.
21. What is a hemocytometer ?
22. Write shortly on the importance of trypsinization. (8×2=16 Marks)

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks. (Answer **not** to exceed **120** words)

23. Write a note on the instruments and equipments used in animal cell culture.
24. Write a note on the characterization of mammalian cell lines.
25. What are serum free media ? Discuss its advantages.
26. Write a short note on interferons.
27. Write a brief note on transport of animal cell cultures.
28. Write a note on transgenic animal technology.



29. Discuss the importance of ethical committee and their guidelines in animal research.
30. Give an account of animals as bioreactors.
31. Discuss the use of antibiotics in cell culture. (6×4=24 Marks)

SECTION – D

Answer **any 2** questions. **Each** question carries **15** marks. (Answer **not** to exceed **three** pages)

32. Write an essay on stem cell technology and its applications in medicine.
 33. Elaborate on the various uses and products of animal cell cultures.
 34. Discuss in detail the composition of animal cell culture media and the various physical parameters to maintain the culture.
 35. Write an essay on the large-scale cultivation of animal cells. (2×15=30 Marks)
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(Pages : 4)

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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018
(First Degree Programme under CBCSS)

Chemistry
Core Course – VII
CH 1543 : PHYSICAL CHEMISTRY – II
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. The number of microstates in a given distribution of molecules is called _____
2. If an operator operates on a well-behaved function to give the same function but multiplied by a constant, then the function is called _____
3. The colloidal dispersion in which both dispersed phase and dispersion medium are liquids is called _____
4. The substances which when dissolved in a medium behave as normal strong electrolytes at low concentration but at higher concentration exhibit colloidal properties are called _____
5. The quantum number which explains the shape of orbital is _____
6. Write down the relations connecting frequency and wave number of electromagnetic radiation.
7. If 'n' is the number of atoms in a molecules, the number of vibrational degrees of freedom of a linear molecule is _____

P.T.O.



8. The ESR spectrum of methyl radical contains _____ signals.
9. The number of signals exhibited by the protons of TMS in its NMR spectrum is _____
10. Give the unit of dipole moment. (10×1=10 Marks)

SECTION – B

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

11. What is meant by :
a) Phase space
b) Ensemble.
12. Give any two examples which violate third law of thermodynamics.
13. What is coagulation of colloid ? Give any one method of coagulation.
14. Define :
a) Black Body
b) Compton effect.
15. How are cartesian co-ordinates related to spherical polar co-ordinates ?
16. Calculate the maximum number of sub-shells, orbitals and electrons present in the m^{th} orbit ($n = 3$).
17. Calculate the reduced mass of HCl ($H = 1.0084$: $Cl = 35.54$).
18. From among the following, pick out those which would give microwave spectrum :
 O_2 , HCl, NH_3 , Cl_2 , CO_2 , CO, N_2 , NO
19. An organic compound C_3H_6O contains a carbonyl group ($>C=O$). How will you distinguish between aldehyde or a ketone and using NMR spectrum ?



20. How many normal modes of vibrations are possible for CO_2 molecule ?
How many of them are IR active ?
21. State Franck-Condon principle.
22. How is molar refraction of a liquid related to its refractive index and density ? (8x2=16 Marks)

SECTION – C

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

23. State and explain Nernst heat theorem. Give its mathematical statement and significance.
24. a) Write down Boltzmann distribution law and explain the terms involved.
b) Give Plank's statement of third law of thermodynamics.
25. a) State Hardy-Schultz rule ? Arrange the following coagulating ions in the increasing order of coagulating power for coagulation of AS_2S_3 sol
 Al^{3+} , Ca^{2+} and Na^+
b) Define imbibition and syneresis.
26. a) Explain Helmholtz electrical double layer.
b) Define :
i) Sedimentation potential
ii) Streaming potential.
27. a) What is meant by Hermitian property of an operator ? What are the two properties of a Hermitian operator ?
b) If $\Psi(x) = e^{ix}$ and $\phi(x) = \sin x$ are two acceptable eigen function, prove that $\frac{d^2}{dx^2}$ is a Hermitian operator.



28. a) Explain the terms stokes and anti-stokes lines with regard to Raman spectrum and compares their intensities.
b) State rule of mutual exclusion.
29. How can the NMR method be used to distinguish between the structures of propan-1-ol and propan-2-ol ?
30. a) What is the essential condition for a molecule to absorb infrared radiation ?
b) Write down the expression for vibrational energy of a simple harmonic oscillator and explain what is meant by zero point energy ?
31. Refractive index of a liquid having molecular mass 123 is 1.552. The density of liquid is 1.203 g cm^{-3} . Calculate the molar refraction. (6×4=24 Marks)

SECTION – D

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

32. Discuss briefly Langmuir's unimolecular theory of adsorption. Derive an expression for Langmuir's adsorption isotherm. Show that at normal pressures, Langmuir adsorption isotherm become identical with Freundlich adsorption isotherm.
33. a) What is photoelectric effect ? What are its important observations ? Explain how Einstein explained photoelectric effect using Plank's quantum theory of radiation. 10
b) Write down the expression for energy of a free particle in 3D cubic box and explain the concept of degeneracy. 5
34. a) Describe the briefly the principles of NMR spectroscopy. What are its applications ?
b) Discuss the classical concept of Raman effect and arrive at the essential condition for a vibration or rotation to be Raman-active.
35. a) What is meant by Parachor ? How can it be determined ? Explain how parachor measurements are useful in structure elucidation of compounds ? 10
b) What is optical exaltation ? Explain. 5

(15×2=30 Marks)



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2018

First Degree Programme Under CBCSS

Mathematics

Core Course

MM 1543 : DIFFERENTIAL EQUATIONS

(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

All the first 10 questions are compulsory. They carry 1 mark each.

1. The order of the differential equation $(x^2 + 3y) \frac{dy}{dx} + (5x^3 - y^2) = 0$ is
2. State True or False : $y = e^{2x}$ is a solution of $\frac{dy}{dx} = 3y$.
3. What do you mean by integral curves of a differential equation ?
4. Obtain the differential equation associated with the primitive $y = Ax^2 + Bx + C$.
5. Solve $y \frac{dy}{dx} = x$.
6. Solve the exact equation $ydx + xdy = 0$.
7. Verify that the function $y = \cos x$ is a solution of the homogeneous linear differential equation $y'' + y = 0$.



8. Verify that $2 + \cos x + \sin x$ is not a solution of $y'' + y = 1$.

9. The auxiliary equation of $x^2y'' + xy' - y = 0$ is

10. Verify that $2x^2 - 1$ is a solution of $y'' + 4y = 8x^2$.

Answer **any 8** questions from among the questions **11 to 22**. These questions carry **2 marks each**.

11. Find the general solution of $y' + 2xy = 0$.

12. Solve the initial value problem $\frac{dy}{dx} - y \tan 2x = 0$; $y(0) = 2$.

13. Solve $\sinh x \cos y dx = \cosh x \sin y dy$.

14. Find the equation of the curve such that at each point (x, y) on the curve the slope equals the square of the distance between the point and the y -axis and the point $(-1, 2)$ is on the curve.

15. Solve $\frac{dy}{dx} = \frac{1-2y-4x}{1+y+2x}$.

16. Make the following equation exact and hence solve : $y dx + (x^2y - x)dy = 0$.

17. Find a differential equation of the form $y'' + ay' + by = 0$ for which the functions e^{-x} , e^{-2x} form a basis.

18. Verify whether the functions $x + 1$, $x - 1$ ($0 < x < 1$) are linearly dependent or not.

19. Solve $y'' + y = 0$, $y(0) = 3$, $y(\pi) = -3$.

20. Solve $y'' + 0.25y = 0$.

21. Solve the initial value problem $y'' - 16y = 0$; $y(0) = 1$, $y'(0) = 20$.

22. Solve $x^2y'' + xy' + y = 0$.



Answer **any 6** questions from the questions **23** to **31**. These questions carry **4** marks **each**.

23. Solve the initial value problem : $xy' - 3y = x^4(e^x + \cos x) - 2x^2$, $y(\pi) = \pi^3 e^\pi + 2\pi^2$.

24. Use Euler's method with $h = 0.1$ to solve the initial value problem

$$\frac{dy}{dx} = x^2 + y^2 \text{ with } y(0) = 0 \text{ in the range } 0 \leq x \leq 0.5.$$

25. Suppose the human population in the earth is increasing at an overall rate of approximately 2 percent per year of the population at that time. Find the doubling time.

26. If ϕ_1 and ϕ_2 are solutions of $y'' + f(x)y' + g(x)y = 0$ then show that $c_1\phi_1(x) + c_2\phi_2(x)$ is also a solution (c_1 and c_2 are arbitrary constants).

27. By reducing to first order solve the second order differential equation $xy'' = 2y'$.

28. Solve the initial value problem $y'' + 3y = 0$; $y(0) = 2$, $y'(0) = 3\sqrt{3}$.

29. If an iron ball of weight $W = 98$ Newton stretches a spring 1.09 m, how many cycles per minute will this mass-spring system execute ? What will its motion be if we pull down the weight an additional 16 cm and let it start with zero initial velocity ?

30. Show that $y_1(x) = x^{1/2}$ and $y_2(x) = x^{-1}$ form fundamental set of solutions of $2x^2y'' + 3xy' - y = 0$. $x > 0$.

31. Solve $y'' - 3y' + 2y = 4x + e^{3x}$.

Answer **any 2** questions from among the questions **32** to **35**. These questions carry **15** marks **each**.

32. a) A tank contains 50 gallons of water with a high salt content in which 75 pounds of salt are dissolved. Beginning at time $t = 0$, water containing 3 pounds of salt per gallon flows in at the rate of 2 gallon per minute and the mixture (which is kept uniform by stirring) flows out at the same rate. When will there be 125 pounds of dissolved salt in the tank ? How much dissolved salt is in the tank at time after a long time ?

b) Solve $2xy \frac{dy}{dx} - y^2 + x^2 = 0$



33. Solve the following differential equations.

a) $\sin y dx + \cos y dy = 0$

b) $(1+x^2) \frac{dy}{dx} = 1+y^2$

c) $xy' - 2y = x^3 e^x$

34. a) Find a general solution of $(4D^2 + 4D + 1)y = 0$, where D is the differential operator $\frac{d}{dx}$.

b) Solve the nonhomogeneous equation $y'' - 4y' + 3y = \sin 3x \cos 2x$.

35. a) Solve by the method of variation of parameters : $(D^2 + 4D + 4)y = \frac{e^{-2x}}{x^2}$

b) Solve $x^2 y'' - 4xy' + 6y = 21x^4$.



(Pages : 7)

F – 2390

Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2018

First Degree Programme Under CBCSS

Open Course

MM 1551.1 : OPERATIONS RESEARCH

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

All the first 10 questions are **compulsory**. They carry 1 mark each :

1. In the LPP :

Maximize $Z = 4x_1 + 2x_2 + 5x_3$

Subject to $x_1 + 2x_2 + x_3 \leq 430$

$$3x_1 + 2x_3 \leq 460$$

$$x_1 + 4x_2 \leq 450$$

$$x_1, x_2, x_3 \geq 0$$

Convert the constraints into equalities.

2. Convert the RHS of the inequality constraint $x_1 - 4x_2 - 5x_3 + x_4 \geq -9$ to positive.
3. If there are four decision variables in an LPP, which method will you use to find an optimal solution ?
4. Define a Basic Feasible solution.
5. What is meant by Degeneracy in transportation problem ?

P.T.O.



6. What should be the number of allocations for the solution to a transportation problem with m-sources and n-destinations to be feasible ?
7. Define an event.
8. Define earliest time of node.
9. What is meant by crashing in CPM terminology ?
10. Which are the three time estimates in PERT ?

SECTION – II

Answer **any 8** questions from among the questions **11 to 22**. These questions carry **2 marks each** :

11. Write the following LPP in standard form :

$$\text{Maximize } Z = 3x_1 + 2x_2$$

$$\text{Subject to } -x_1 + 2x_2 \leq 4$$

$$3x_1 + 2x_2 \leq 14$$

$$x_1 - x_2 \leq 3;$$

$$x_1 \geq 0; x_2 \geq 0.$$

12. Represent the following LPP given in standard form in matrix – vector notation :

$$\text{Minimize } Z = 3x_1 + x_2 + x_3 + x_4$$

$$\text{Subject to } -2x_1 + 2x_2 + x_3 = 4$$

$$3x_1 + x_2 + x_4 = 6$$

$$x_1, x_2, x_3, x_4 \geq 0.$$

13. Use graphical method to solve the following LPP :

$$\text{Maximize } Z = 6x_1 + 5x_2$$

$$\text{Subject to } 3x_1 + x_2 \leq 160$$

$$x_1 \leq 40$$

$$x_2 \leq 130; x_1, x_2 \geq 0.$$



14. Define degenerate basic feasible solution.
15. Write the standard transportation problem.
16. Define unbalanced transportation problem.
17. What is an assignment problem ?
18. What is meant by non-standard assignment problem ?
19. How can we solve an assignment problem of maximization ?
20. Which are the uses of PERT ?
21. Mention two uses of CPM.
22. Write two applications of PERT and CPM.

SECTION – III

Answer **any 6** questions from among the questions **23 to 31**. These questions carry **4 marks each** :

23. The Handy-Dandy company wishes to schedule the production of a kitchen appliance that requires two resources – labour and material. The company is considering three different models and its production engineering department has furnished the following data :

	Model		
	A	B	C
Labour (hours per unit)	7	3	6
Material (Pounds per unit)	4	4	5
Profit (\$ per unit)	4	2	3

The supply of raw material is restricted to 200 pounds per day. The daily availability of labour is 150 hours. Formulating this as a linear programming model to determine the daily production rate of the various models in order to maximize the total profit.



24. Solve the following LP problem graphically :

Maximize $Z = 7x_1 + 10x_2$

Subject to $x_1 \leq 36 ; x_2 \leq 12, x_1 + 4x_2 \leq 60$

$2x_1 + x_2 \geq 30, x_1 - x_2 \geq 0, x_1 \geq 0, x_2 \geq 0.$

25. Use simplex method to solve the following LPP :

Maximize $Z = x_1 + 3x_2$

Subject to $x_1 \leq 5$

$x_1 + 2x_2 \leq 10$

$x_2 \leq 4$

$x_1, x_2 \geq 0.$

26. Obtain an initial basic feasible solution to the following transportation problem using Vogel's approximation method :

	D_1	D_2	D_3	D_4	D_5	Supply
S_1	100	150	200	140	35	400
S_2	50	70	60	65	80	200
S_3	40	90	100	150	130	150
Demand	100	200	150	160	140	

27. Find an initial basic feasible solution of the following transportation problem using North West corner rule :

	D_1	D_2	D_3	D_4	Supply
S_1	10	2	20	11	15
S_2	12	7	9	20	25
S_3	4	14	16	18	10
Demand	5	15	15	15	



28. Obtain 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
M_1	15	10	9
M_2	9	15	10
M_3	10	12	8

29. A group of four boys and four girls are planning on a one day picnic. The extent of mutual happiness between boy i and girl j when they are together is given by the following matrix.

		Girl			
		1	2	3	4
Boy	1	11	1	5	8
	2	9	9	8	1
	3	10	3	5	10
	4	1	13	12	11

Decide the proper matching between boys and girls during picnic that will minimize sum of all mutual happiness.

30. Draw the network of the project consisting of 5 jobs A, B, C, D and E with the following job sequence :
- Job A precedes C and D
 - Job B precedes D
 - Job C and D precedes E.
31. For an activity with optimistic time of completion 3 days pessimistic time of completion 5 days and most probable time of completion 4 days, find its expected time of completion variance of the job time.



SECTION – IV

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

32. Solve the following LPP using simplex method :

$$\text{Maximize } Z = 5x_1 + 4x_2$$

$$\text{Subject to } 6x_1 + 4x_2 \leq 24$$

$$x_1 + 2x_2 \leq 6$$

$$-x_1 + x_2 \leq 1$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0.$$

33. Find an optimal solution of the following transportation problem :

	D_1	D_2	D_3	D_4	Supply
S_1	2	2	2	1	3
S_2	10	8	5	4	7
S_3	7	6	6	8	5
Demand	4	3	4	4	

34. A batch of 4 jobs can be assigned to five different machine. The set up time for each job on various machines is given by the following table :

Job	Machine				
	M_1	M_2	M_3	M_4	M_5
J_1	10	11	4	2	8
J_2	7	11	10	14	12
J_3	5	6	9	12	14
J_4	13	15	11	10	7

Find an optimal assignment of jobs to machine which will minimize the total set up time.



35. Draw the project consists of a activities for which relevant data are given below :

Activity	Preceding activities	Duration (days)
A	—	5
B	A	9
C	A	7
D	B, C	4
E	A	8
F	D, E	13
G	C	12
H	F, G	6
I	H	8

- Draw the network.
- Identify the critical path and project completion time.



Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2018
First Degree Programme under CBCSS
ACCOUNTING FOR SPECIALISED INSTITUTIONS
Common for Core Course CO 1543 (2013 Adm. Onwards)/CC1543
(2013 Admn.)/CC1544 (2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What do you mean by Reversionary Bonus ?
2. What is Valuation Balance Sheet ?
3. Why reserve for unexpired risk is provided in general insurance ?
4. What do you mean by doubtful assets ?
5. What are included under the head Appropriations in Bank Profit and Loss Account ?
6. What is Contingency Reserve in the case of Electricity Companies ?
7. What is a consolidated fund of Government ?
8. What is Kerb Trading ?
9. What do you mean by NPA ?
10. What is Reinsurance ?

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. Define Surplus in the case of Electricity Company Accounts.
12. Define Standard Asset.
13. What is the difference between Revenue Account and Net Revenue Account ?
14. Write note on Reasonable Return.
15. What are the difference between life insurance and general insurance ?
16. What do you mean by Non-Banking Assets ?
17. What is Contingent Liability ?
18. Give any two features of government accounts.
19. The Revenue Account of a Life Insurance Company showed a Life Assurance Fund of Rs. 42,50,000 before considering the following adjustments :
 - i. Interest and dividends on investments Rs. 3,20,000 (Tax deducted at source Rs. 1,00,000)
 - ii. Reinsurance claims recoverable Rs. 80,000.
 Recalculate Life Assurance Fund.
20. Calculate the amount of provision to be shown in the Profit and Loss Account of Easy Bank Ltd.

Assets

Standard

Substandard (Value of security Rs. 6,000 lakhs)

Rs. (in lakhs)

9,000

7,000

21. Give Journal entries for the following :

Bonus utilized in reduction of premium Rs. 50,000

Claims intimated and admitted but not paid during the year Rs. 98,000

Interest accrued on investments Rs. 10,000

Provision for taxation Rs. 20,000



22. India Life Insurance Company gets its valuation made once in every two years. Its life assurance fund on 31st March 2017 stood at Rs. 50,65,000 before providing for Rs. 45,000 being shareholders' dividend for 2017. Its actuarial valuation on 31st March 2017 disclosed a net liability of Rs. 40,20,000. An interim bonus of Rs. 80,000 was paid to the policyholders during the previous two years.

Prepare a statement showing the amount now available as bonus to policyholders, assuming that the policyholders are entitled to 95 % of surplus as under LIC Act. (8×2=16 Marks)

SECTION – C

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

23. How profit is calculated in Life Insurance companies ?
24. Distinguish Double Account and Single Account System.
25. List out the books of accounts to be maintained by Stock brokers.
26. Explain the method of calculating depreciation in Electricity Company Accounts.
27. Explain the features of Government Accounts.
28. What is Rebate on Bill Discounted ? How it is accounted in the books a bank ?
29. From the following calculate the amount of claims to be shown in the revenue account of New Life Insurance Company for the year ended 31-3-2017.

Claims intimated in	Admitted in	Paid in	Amount
2015 – 16	2015 – 16	2016 – 17	45,000
2016 – 17	2016 – 17	2017 – 18	30,000
2014 – 15	2015 – 16	2015 – 16	15,000
2014 – 15	2015 – 16	2016 – 17	36,000
2016 – 17	2017 – 18	2017 – 18	24,000
2016 – 17	2016 – 17	2016 – 17	3,06,000

Reinsurance claim at the end amounted to Rs. 1,75,000.



30. Bharat Gas Company rebuilt their works with double the capacity at a cost of 10,00,000. The cost of the parts of the old works used amounts to Rs. 3,50,000. It is also known that old material of Rs. 15,000 was reused and material worth Rs. 25,000 was sold away. The cost of the labour and materials are 50 % higher now than at the time old works were built. You are required to make necessary calculations and give journal entries.

31. The Newgen Bank Ltd. has the following bills in its advances portfolio on 31st March 2017.

Sl. No.	Date of bill	Amount (Rs.)	Term (months)	Date of maturity
1	Feb. 11	5,000	4	June 14, 2018,
2	Feb. 16	6,000	3	May 19, 2018
3	March 7	4,000	2	July 10, 2018

The rate of discount is 10 %. You are required to calculate the Rebate on Bills Discounted and give necessary journal entries.

(6×4=24 Marks)

SECTION – D

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

32. Following information is extracted from the accounting records of High Power Electricity Supply Ltd. for the financial year ended 31st March 2017.

	(Rs. in crores)
Share capital	60.00
Fixed Assets (tangible) at cost	116.00
Accumulated Depreciation	40.00
Intangible Assets	6.00
Investments : Depreciation Reserve Fund	40.00
Contingency Reserve	4.00



Loan from State Electricity Board	10.00
12% Debentures	20.00
Tariff and Dividend Control Reserve	6.00
Net profit after tax	12.20
Customers' Security Deposits	6.00
Monthly Average of Current Assets	7.00

The monthly average of current assets includes Rs. 1,00,00,000 (one crore) due from customers. Investments yields 10% return p.a. The applicable bank rate is 9% p.a.

You are required to determine :

- The capital base;
- The Reasonable return;
- The disposal of profit.

33. From the following Trial Balance prepare the final accounts of Jubilee Bank for the year ended 31-3-2017.

Debit Balances	Amount (Rs.)	Credit Balances	Amount (Rs.)
Cash in hand	2,00,000	Interest received on advances	8,00,000
Balance with other banks	4,00,000	Interest on investments	1,25,000
Cash with RBI	1,00,000	Commission Exchange and	
Investment	4,00,000	brokerage	2,00,000
Bill purchased and discounted	2,50,000	Profit on sale of investment	20,000
Salary and allowances	75,000	Other Receipts	80,000
Printing and stationery	35,000	Share Capital	20,00,000
Other expenses	45,000	Statutory Reserve	9,00,000



Interest Accrued	50,000	Bills Payable	1,00,000
Interest paid	1,20,000	Borrowings from RBI	1,00,000
Furniture	2,50,000	Borrowings from other banks	3,00,000
Premises	13,75,000	Current account	1,25,000
Term loan	12,75,000	Saving Bank account	3,25,000
Cash credit and overdraft	14,25,000	Fixed Deposit	2,75,000
		Profit and Loss Account	
		(1-4-2016)	6,50,000
Total	60,00,000	Total	60,00,000

Additional Information :

- Bill for collection totaled Rs. 2,35,000
 - Provide for doubtful debts Rs. 3,85,000
 - Proposed Dividend on shares @ 20 %
34. Needy Insurance Company Ltd. has furnished the following information for the preparation of Revenue Account for fire insurance business for the year ended 31st March 2017.

	Amount (Rs.)
Claims admitted but not paid	42,376
Commission paid	50,000
Commission on reinsurance received	12,000
Share transfer fee	5,000
Expenses of management	78,000
Bad debts	2,500
Claims paid	15,000
Profit and Loss Appropriation Account	10,000



Premiums received less re-insurance	5,52,000
Reserve for unexpired risks as on 1-4-2016	2,30,000
Additional Reserve on 1-4-2016	40,000
Claims outstanding as on 1-4-1999	27,000
Dividend on share capital	18,500

Following further information has also to be considered :

- i) Premiums outstanding at the end of the year – Rs. 40,000.
- ii) It is the policy of the company to maintain 50% of premium towards reserve for unexpired risks.
- iii) Additional reserve at 10% of net premium to be maintained.

35. Who is Comptroller and Auditor General ? What are the duties, powers and functions of Comptroller and Auditor General of India ? (2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2018
First Degree Programme Under CBCSS
Core Course : CO 1541/CC 1542
FUNDAMENTALS OF INCOME TAX
(2014 Admn. Onwards)
(Common for Commerce/Commerce with Computer Application)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is total income ?
2. What you mean by perquisites ?
3. What is RRV ?
4. What you mean by profession ?
5. What is block of assets ?
6. What is TDS ?
7. What you mean by assessee in default ?
8. What is unabsorbed depreciation ?
9. What you mean by bond washing transactions ?
10. What you mean by clubbing of income ?

(10×1=10 Marks)

P.T.O.

**SECTION – B**

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

11. Define previous year.
12. Define gratuity.
13. What you mean by capital asset ?
14. Define transfer.
15. What you mean by tax free government securities ?
16. Define tax evasion.
17. Define casual income.
18. Define CII.
19. Define dividend.
20. Who is a not ordinary resident ?
21. Explain Sec. 54 of Income-Tax Act.
22. Define business.

(8×2=16 Marks)

SECTION – C

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

23. Define the following as per Income Tax Act :
 - a) Salaries
 - b) Perquisites
 - c) Profit in lieu of salary.



24. Mr. Hemanth has income of Rs. 5,60,000 for the year 2017-18. He gave the following donations, during this year :
- To Andhra Pradesh Chief Ministers Cyclone Fund Rs. 10,000
 - To an approved fund set up for rural development Rs. 15,000
 - To a National Laboratory for specific research Rs. 20,000
- Calculate his total income if his income consists of Rs. 3,00,000 taxable under the head profits and gains.
25. Calculate the tax liability of an individual for the Assessment Year 2018-19 :
- Total income Rs. 2,10,000
 - Agricultural income Rs. 4,000.
26. Point out any eight incomes under the head 'Income from other sources'.
27. Distinguish between RPF and SPF.
28. Mr. X came to India for the first time on 1st November 2016. During his stay in India upto 30th October, 2017 he stayed at Mumbai upto 10th May 2017 and thereafter remained in Bangalore till his departure from India. Determine his residential status for the Assessment Year 2018-19.
29. Following are the taxable income of Mr. R for the PY 2017-18 :
- 1) Income from salary accrued and received in India Rs. 20,000
 - 2) Profit of a hotel business at Melbourne Rs. 30,000
 - 3) Dividend declared in Perth but received in India Rs. 4,000
 - 4) Income from transfer of a long-term capital at Manchester, which was received in India Rs. 20,000



5) Interest on debentures of a company at Manchester, which was received in India Rs. 6,000

6) Interest received from Mr. P, a non-resident, on the loan provided to him for a business carried on in India Rs. 5,000

Compute the total income of Mr. R if he is a not ordinarily resident for the Assessment Year 2018-19.

30. X is appointed at Kolkata. He is stayed in a hotel for 25 days and thereafter shifted in a house provided by the employer. From the following information determine the taxable value of perquisite, stay in hotel :

1) Room rent in hotel Rs. 1,000 per day.

2) Salary for valuation of accommodation during the P.Y. Rs. 3,65,000.

3) The employer recovered Rs. 100 per day from X regarding stay in hotel.

31. Explain the provisions regarding set off of losses. (6×4=24 Marks)

SECTION – D

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

32. Following are the particulars of 2 let out losses of Mr. Ashok Jain. Compute his income from house property.

	House A	House B
Municipal valuation	4,20,000	3,50,000
Fair rental value	3,60,000	3,80,000
Standard rent	4,40,000	3,20,000



Actual rent	4,80,000	4,20,000
Unrealised rent of current year	40,000	35,000
Vacancy	2 months	1 month
Municipal taxes		
actually paid	12,000	25,000
Due but not paid	30,000	10,000
Repairs	10,000	8,000
Insurance premium	12,000	6,000
Other expenses	8,000	10,000
Interest on money borrowed for the purchase of house	–	60,000

33. From the following particulars of Shri Ramesh, compute his salary income.

Salary Rs.15,000 p.m.	1,80,000
Bonus	6,000
DA	1,800
Entertainment allowance	6,000
Employers contribution to RPF	21,000
Employees contribution to RPF	21,000
Interest on PF @ 12%	2,400
Personal expenses of Mr. Ramesh's son met by the employer	1,000
Rent-free unfurnished house provided by the employer, whose annual rental value is (at Delhi)	36,000



Total salary paid by the employer to the watchman engaged at

Mr. Ramesh's house 4,800

Medical expenses of the employee 600

Free refreshment during the office hours 3,000

Club bill of the assessee paid by the employer 400

ULIP contribution paid by the employer 6,000

He deposited Rs.12,000 in PPF

He was provided with rent-free house for a period of 8 months only during 2017-18 after which he shifted to his own house. He contributed to enjoy the facility of a watchman for his own house also.

34. The following is the Profit and Loss Account of Mr. X for the year ended 31st March 2018. Compute his taxable income from business for that year :

Opening stock	15,000	Sales	1,80,000
Purchases	40,000	Closing stock	20,000
Wages	20,000	Gift from father	10,000
Rent	46,000	Sales of car	17,000
Repairs of car	3,000	Income tax refund	3,000
Medical expenses	3,000		
General expenses	10,000		
Depreciation of car	4,000		
Profit for the year	89,000		
	2,30,000		2,30,000



Following further information is given :

- 1) Mr. X carries on his business from a rented premises half of which is used as his residence.
- 2) Mr. X bought a car during the year for Rs. 20,000. He charged 20% depreciation on the value of the car. The car was sold during the year for Rs. 17,000. The use of the car was $\frac{3}{4}$ th for the business and $\frac{1}{4}$ th for personal use.
- 3) Medical expenses were incurred during the sickness of Mr. X for his treatment.
- 4) Wages include Rs. 250 per month on account of Mr. X driver for 10 months.

35. How will the residential status of an individual be determined ? **(2×15=30 Marks)**
