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D – 2371

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

HISTORY

Core Course VI

HY 1541 : Major Trends in Historical Thoughts and Writings

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. Thucydides
2. 'Long Duree'
3. Empiricism
4. Siyas a tradition
5. 'Annales Maximi'
6. Humanism
7. Francis Bacon
8. Gimbattista Vico
9. Enlightenment
10. Productive forces.

(10x1=10 Marks)

P.T.O.



PART – B

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

11. What is post-modernism ?
12. Make a note on positivism.
13. Explain the contributions of Voltaire to enlightenment historiography.
14. Write the contribution of Tacitus to Roman historiography.
15. Why Herodotus is called as father of History ?
16. Explain the concept structuralism.
17. What is objectivity ? Is it possible in history writing ?
18. What is romanticism ? Explain its major ideas.
19. What does the term mode of production means in Marxian understanding of History ?
20. Explain the main ideas of Subaltern I-historiography.
21. Explain the term Chronicles.
22. What is historical seminars ?

(8×2=16 Marks)

PART – C

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

23. Contribution of St. Augustine.
24. Critically examine the Berlin Revolution in historiography.
25. Trace the development of historiography in China.
26. Write the main features of Renaissance historiography.
27. Describe Leopold Ranke's concept of history.



28. Make a note on third phase of Annales school.
29. Examine the influence of Descartes on modern historiography.
30. Delineate the important features of Greek historiography.
31. Assess the contributions of Jean-Francois's Lyotard. (6×4=24 Marks)

PART – D

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

32. How historical materialism effected a paradigm shift in historical studies ?
 33. Critically examine the characteristic features of Annales school.
 34. Analyse the contribution of Ibn Khaldun to the medieval Arab historiography.
 35. Discuss the major features of Roman historiography. (2×15=30 Marks)
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D – 2372

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

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** the questions in **one** or **two** sentences **each**. **Each** carries **one** mark.

1. Asiatic Society of Bengal.
2. Sati.
3. R.C. Dutt.
4. Rani Laxmibai.
5. Sir Thomas Rao.
6. Albuquerque.
7. Siraj-Ud-Daula.
8. Vasco-da-Gama.
9. Treaty of Manglore.
10. Poligars.

(10×1=10 Marks)

PART – B

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

11. Doctrine of Lapse.
12. Vellore Mutiny.

P.T.O.

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13. Drain theory.
14. Fakir uprising.
15. Treaty of Sriranga Pattanam.
16. Charter Act of 1833.
17. Subaltern studies.
18. Greased cartridge affair.
19. Portuguese settlements in India.
20. Lord Wellesley.
21. Wood's Despatch.
22. Pazhassi Raja.

(8×2=16 Marks)

PART – C

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

23. Anglo Maratha wars and its results.
24. Significance of the Pitt's India Act of 1784.
25. Battle of Buxar and its significance.
26. Nationalistic approach to Indian history.
27. Causes for the failure of the revolt of 1857.
28. Marxist historiographical writings on Indian history.
29. Role of Christian Missionaries in the development of education in India.
30. Various social reform measures taken by the British government in India.
31. Santhal rebellion.

(6×4=24 Marks)



PART – D

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

32. Examine the various interpretations on the nature of the revolt of 1857.
 33. Account on the role played by various socio-religious movements of the 19th century towards the social awakening in India.
 34. Analyse the features of the land revenue policies introduced by the British in India and evaluate them.
 35. Discuss the main stages in the Anglo-French rivalry of South India and its impact.
(2×15=30 Marks)
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D – 2373

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

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** or **two sentences each**. Each question carries **one** mark.

1. Kansas Nebraska Act
2. Victor Emmanuel II
3. The Frankfurt assembly
4. Tripple Alliance
5. Teutonism
6. 'Axis Powers'
7. 'Avanti'
8. Winston Churchill
9. UNESCO
0. The Red shirt.

(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. Garrison.
12. Garibaldi.
13. Franco-Prussian war.
14. Kellogg Briand Pact.
15. Balkan Crisis.
16. The Yalta conference.
17. Treaty of Sevres.
18. C.U.P.
19. Why did Hitler hate the Jews ?
20. International court of justice.
21. NATO.
22. Bagdad Pact.

(8×2=16 Marks)

PART - C

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

23. Estimate the greatness of Abraham Lincoln.
24. Describe the similarities and differences between the league of nations and the UNO.
25. Examine the role of Mustapha Kamal Pasha as reformer ?



26. Explain the foreign policy of Italy under Mussolini.
27. What was the Pearl Harbour incident ?
28. Write a short essay on the Postdam Conference.
29. Assess the role of Count Cavour in the Unification of Italy.
30. Trace the growth of Nazism in Germany.
31. Assess the role of Japan in the Second World War. (6×4=24 Marks)

PART – D

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

32. Enumerate the social and economic differences between the Southern and Northern States of the U S A on the eve of the civil war.
 33. Describe the causes of the First World war.
 34. Describe the causes and effects of economic Depression of 1929.
 35. How was the U.N.O. founded ? What are its aims ? How does it function ? (2×15=30 Marks)
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D – 2374

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

HISTORY

Core Course – IX

HY 1544 : History of Pre-Modern Kerala

(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. Kodakkal
2. Fawcett
3. Akananuru
4. Grandhavaris
5. Kulasekhara Alwar
6. Muzhikulam Kaccam
7. Uralar
8. Kalari
9. Anchuvannam and Manigramam
10. Janmi System. (10×1=10 Marks)

PART – B

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

11. Patittupattu
12. Pattanam
13. Parasurama Legend
14. Kantalur Salai
15. Chandrolsavam

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16. Sankaracharya
17. Jewish Copper Plate of Bhaskara Ravi Varma
18. Keralolpathi
19. Land Grants
20. Marumakkathayam
21. Tipu Sultan
22. Trippadidanam.

(8x2=16 Marks)

PART – C

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

23. Give an account of the contribution of Buddhism to Kerala culture and society.
24. Write a note on Sangam literature.
25. Give an account of the Cheraman Perumal Legend.
26. Describe briefly about the temple oriented society of Kerala and its characteristic features.
27. Mysorean invasion paved the way for the cultural transformation in Malabar". Discuss.
28. Write a note on Pulappedi and Mannappedi.
29. Give an account of the knowledge tradition of Kerala.
30. Discuss the contribution of Elamkulam Kunjan Pillai to the historiography of Kerala.
31. How for geographical factors of Kerala influenced the course of Kerala history ?

(6x4=24 Marks)

PART – D

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

32. Examine the significance and salient features of megalithic culture of Kerala.
33. Discuss how trade and markets functioned during the Perumal period.
34. Examine the rise and growth of Nadus and Swarupams in Kerala.
35. Write an essay on the performing Art forms of Kerala.

(2x15=30 Marks)



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D – 2375

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

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. Drain theory
2. A. O. Hume
3. Balagangadhar Tilak
4. Annie Besant
5. Rowlatt Act
6. Jallianwala Bagh
7. Poona Swaraj
8. Crips Mission
9. Do or Die
10. Lala Lajpat Roy.

(1×10=10 Marks)

PART – B

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

11. Dadabhai Naoroji.
12. Safety valve theory.
13. Partition of Bengal.
14. Surat Split.

P.T.O.

D – 2375



15. Ghadar party.
16. Chauri – Chaura.
17. Nehru report.
18. Poona Pact.
19. Khan Abdul Ghaffar Khan.
20. HSRA.
21. RIN mutiny.
22. Mountbatten plan.

(8×2=16 Marks)

PART – C

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

23. Explain the main programmes of the moderate congress.
24. Discuss the background of the *swadesi* movement. Assess its impact on Indian freedom struggle.
25. Describe the significance of Home Rule League.
26. Explain the Constitutional changes brought about by the Montague – Chelmsford reforms.
27. Examine the role of Swarajist Party.
28. Examine the significance of Civil-Disobedience movement.
29. Illustrate the importance of the Quit India Movement.
30. Examine the contributions of Subhash Chandra Bose towards the making of modern India.
31. Write a note on the integration of Indian States.

(6×4=24 Marks)

PART – D

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

32. Discuss the causes for the birth of national consciousness in colonial India.
33. Describe the significance of Khilafath and non-cooperation movement.
34. How far did the spread of socialist ideas and the growth of peasant and working class movements contributed for the development of the national movement ?
35. Explain the development of communal politics that led to the partition of 1947.

(2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

Economics

Core Course : VI

EC – 1541 : MICRO ECONOMICS – II

(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

PART – A (Very short answer type questions)

Answer **all** questions in **a word or sentence**.

1. Oligopoly.
2. Selling cost.
3. Market price.
4. Natural monopoly.
5. Economic rent.
6. Functional distribution.
7. Money wage.
8. Entrepreneurship.
9. Fair game.
10. Market failure.

(10×1=10 Marks)



PART – B (Short answer type questions)

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

11. What is meant by monopoly ? State the important conditions of monopoly.
12. Give the reasons for stickiness in price under oligopoly market condition.
13. Distinguish between mixed and pure strategies.
14. State the concept of dominant strategy.
15. Briefly explain the concept of Quasi rent.
16. State the concept of capital accumulation.
17. What is Euler's theorem states ?
18. State four factors affecting the real wages.
19. What are the important characteristics of land ?
20. State the concept of risk aversion.
21. How can we find the expected value of a random variable ?
22. State the Markowitz hypothesis.

(8×2=16 Marks)

PART – C (Short essay)

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

23. What is monopolistic competition ? How the price and output is determined under such market condition ?
24. If demand for $x(D_x) = 1000 - 50P$ and supply $(S_x) = 700 + 25P$, find the equilibrium price and quantity.
25. State the Nash Equilibrium.
26. State and explain the market clearing concept.
27. Explain the modern theory of rent.



28. State the characteristics of labour.
29. Explain the role of trade union in raising wages.
30. What is market failure ? What are the main causes for it ?
31. Explain Bernoulli's hypothesis and St. Peters Burg Paradox. (6×4=24 Marks)

PART – D (Long essay)

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

32. "In the short run a firm under perfect competition can make super normal profit or incur loss". Explain.
 33. Critically examine the marginal productivity theory of distribution.
 34. What is meant by welfare economics ? Discuss the condition for Pareto optimality.
 35. Explain the Neuman-Morgestern utility function. (2×15=30 Marks)
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D – 2380

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

ECONOMICS

Core Course – VII

EC-1542 : Macro Economics – II

(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Liquidity preference.
2. Creeping inflation.
3. Macroeconomics.
4. Boom.
5. Transaction demand for money.
6. Trade cycle.
7. Barter system.
8. Velocity of circulation of money.
9. Exchange rate.
10. Money.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Explain neutrality of money.
12. What liquidity trap ?
13. Explain Fisher effect.
14. Explain Natural rate of Unemployment.
15. Explain Pigou effect.
16. Explain demand for money.
17. Transfer Payments.
18. What is consumer price index ?
19. What is money supply ?
20. Explain Monetary policy.
21. List out the factors affecting money supply in an economy.
22. What are the social costs of inflation ?

(8×2=16 Marks)

SECTION – III

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

23. What are the determinants of investment ?
24. What absolute income hypothesis ?
25. Discuss the H-theory of money supply.



26. Explain clearly the cash balance approach.
27. What is life cycle hypothesis ?
28. Explain Philips Curve.
29. What is Fiscal policy ?
30. What is classical dichotomy ?
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. Critically explain the liquidity preference theory of money.
 33. Critically examine the Permanent Income Hypothesis.
 34. Friedman's reformulation of Quantity Theory of Money (QTM) involves the inter-action of money, price level and rate of interest. Elucidate.
 35. Explain the Hick's theory of trade cycle. (2×15=30 Marks)
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D – 2381

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

ECONOMICS

Core Course : VIII

EC-1543 : Development Economics

(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

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

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Explain Gini Coefficient.
12. What is golden age growth ?
13. Explain Human Deprivation Index.
14. Explain Lorenz curve.
15. Explain shocks and stimulants.
16. Explain Surplus value.
17. What is growth agent according to Libenstein ?
18. Explain forward linkages.
19. What is division of labour ?
20. Explain the concept of SOC.
21. Explain indivisibilities.
22. Explain backward linkages.

(8×2=16 Marks)

SECTION – III

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

23. What is HDI ?
24. What are the different characteristics of LDCs ?
25. Discuss the development views of Joan Robinson.
26. Explain PQLI.



27. What is vicious circle of poverty ?
28. Explain different measures of economic development.
29. What is balanced growth ?
30. Explain Schumpeter's concept of innovation.
31. Distinguish between growth and development. (6x4=24 Marks)

SECTION - IV

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

32. Critically explain unlimited supplies of labour.
 33. Explain Harrod-Domar growth model.
 34. Explain the theory of unbalanced growth.
 35. Discuss the development views of Adam Smith. (2x15=30 Marks)
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D – 2382

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

ECONOMICS

Core Course – IX

EC - 1544 : Indian Economy

(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Disguised unemployment
2. Green revolution
3. NITI Aayog
4. Infrastructure
5. Social Overhead Capital
6. Hand Industries
7. Disinvestment
8. Health infrastructure
9. MRTP Act
10. Migration.

(10x1=10 Marks)

P.T.O.



SECTION – II

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

11. Write an note on democratic decentralisation in India.

12. Explain demographic dividend.

13. Salient features of mixed economy.

14. Functions of planning commission.

15. Economic drain of wealth.

16. What are HYV seeds ?

17. Educated unemployment in Kerala.

18. Five year plans in India.

19. Examine the features of MGNRGA programme.

20. Examine the strategy of planning in India.

21. Cropping pattern in India since economic reforms.

22. Examine the role of industries in Indian Economy.

(8×2=16 Marks)

SECTION – III

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

23. Evaluate the significance of public sector enterprises in the present context.

24. Explain the objectives of planning in India.

25. Examine the issues faced by the health sector in the post liberalisation period.

26. What are the issues faced by the energy sector in India ?

27. Explain the role of planning in inclusive growth and development in India.



28. Explain the nature of occupational distribution in India.
29. Examine the factors determining agricultural productivity in India.
30. Examine the role of small scale industries in Indian economy.
31. Examine the role of service sector in the Indian economy since economic reforms.
(6×4=24 Marks)

SECTION – IV

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

32. Evaluate the achievements and failures of five year plans in India.
 33. Critically evaluate the role of new agricultural strategy and green revolution in addressing the issue of food security in India.
 34. Examine the demographic profile of India in the light of Census 2011.
 35. Examine the salient features of new industrial policy resolution 1991. (2×15=30 Marks)
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D – 2383

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

Economics

Core Course – X

EC 1545 : PUBLIC ECONOMICS

(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. VAT.
2. Private Goods.
3. Vertical imbalance.
4. Monetary Policy.
5. Fiscal Federalism.
6. Proportional taxation.
7. Merit goods.
8. Impact of taxation.
9. Market failure.
10. Tax revenue.

(10x1=10 Marks)

P.T.O.



SECTION – II

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

11. Distinguish between progressive and regressive taxation.
12. What are the salient features of GST ?
13. What are public goods ? What are its features ?
14. Explain the canon of economy of taxation.
15. Explain the cost of service principle of taxation.
16. Explain shifting of taxes.
17. Identify the different revenue sources of states in the pre GST period.
18. Explain balanced budget.
19. Explain the concepts of internal and external debt.
20. What do you mean by taxable capacity ?
21. What are the advantages and disadvantages of direct taxation system ?
22. "Public expenditure moves in jerks like manner". Explain. **(8×2=16 Marks)**

SECTION – III

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

23. Explain economic classification of budgeting.
24. Critically evaluate the benefit theory of taxation.
25. Examine production and consumption effects of taxation.



26. Explain the concepts of deficit financing.
27. How public goods generate externalities ?
28. What are reasons for the growth of public expenditure in developing economies ?
29. Examine the stabilisation function of modern governments.
30. Explain forward and backward shifting of tax.
31. Explain the different sources of non-tax revenue. (6×4=24 Marks)

SECTION - IV

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

32. Evaluate the different canon of taxation.
 33. "Govt. activities should be carried out up to the level where the marginal social benefit equals the marginal social cost". Elucidate.
 34. Critically evaluate the ability to pay theory of taxation.
 35. Explain the meaning, classification and methods of redemption of public debt. (2×15=30 Marks)
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D – 2384

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

Branch : Economics

Open Course : I

EC – 1551 : HUMAN RESOURCE MANAGEMENT
(2013 and 2014 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Training.
2. Strategic management.
3. Human capital management.
4. Labour market.
5. Promotion.
6. Job rotation.
7. Retrenchment.
8. Outsourcing.
9. Demotion.
10. Human Resource Gap.



(Pages : 3)

D – 2464

Reg. No. :

Name :

**Fifth Semester B.A./B.Sc./B.Com./B.B.A./B.C.A./B.S.W. Degree
Examination, December 2017**

First Degree Programme under CBCSS

PHYSICAL EDUCATION

Open Course

**PE 1551 : Health and Fitness Education
(2013 Admission Onwards)**

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. Which component of food is considered as the building block of the body ?
2. Name the clinical term for excess body weight.
3. What is Agility ?
4. Which vitamin is synthesized with the help of sunlight ?
5. Expansion of RBC.
6. Combination of strength and speed.
7. How many calories can one gram of protein produce ?
8. On which day National Sports Day is celebrated ?
9. Name the supreme award in India for the outstanding sports trainers.
10. What is RICE ?

(10×1=10 Marks)

P.T.O.



PART – B

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

11. Define physical education.
 12. What are the dimensions of health ?
 13. Differentiate between Aerobic and Anaerobic activities.
 14. Define balanced diet.
 15. What are the various types of strength ?
 16. What are the physical fitness components ?
 17. What is second wind ?
 18. What is Diastolic Blood Pressure ?
 19. What is muscle cramp ?
 20. What is tidal volume ?
 21. What is CPR ?
 22. What is the meaning of wellness ?
- (8×2=16 Marks)**

PART – C

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

23. What are the advantages of warming up ?
24. Explain the first aid for sprain.
25. Describe the principles of first aid.
26. Discuss the role of media in sports.
27. What are the objectives of physical education ?
28. Describe the effect of exercise on respiratory system.



29. Explain the role of diet and nutrition on sports performance.
30. Write notes on Santhosh Trophy and Ranji Trophy tournaments.
31. Define health and explain the determinants of health. (6×4=24 Marks)

PART – D

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

32. Write an essay on Physical Fitness.
33. Write an essay on Olympics.
34. What you mean by hypo-kinetic diseases ? Explain any three common hypokinetic diseases and their management.
35. Smoking and alcohol consumption are injurious to our health. Discuss. (2×15=30 Marks)
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D – 2493

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

Economics

Core Course : VI

EC – 1541 : MONEY AND MODERN BANKING

(2015 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Legal tender money.
2. Money multiplier.
3. Bank rate.
4. Open market operations.
5. RTGS.
6. Co-operative banks.
7. Subprime lending.
8. Mutual funds.
9. Promissory notes.
10. Financial inclusion.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. Differentiate between money and near money.
12. What is meant by velocity of money ?
13. Write a brief note on high powered money.
14. Functions of NABARD.
15. What is micro finance ?
16. Significance of CRR and SLR.
17. What is meant by a negotiable instrument ?
18. What are the services provided by mutual funds ?
19. List out the reasons for increasing NPA in Indian banking system.
20. Differentiate between credit card and debit card.
21. What is meant by MICR cheque ?
22. Objectives of monetary policy.

(8×2=16 Marks)

SECTION – III

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

23. Explain various stages in the evolution of money.
24. Briefly explain various limitations on credit creation by Commercial Bank.
25. Discuss functions of a Central Bank with special reference to RBI.
26. Explain the benefits of CORE banking.



27. Explain liquidity preference theory of demand for money.
28. Differentiate between general crossing and special crossing of cheques.
29. Discuss various e-services provided by Commercial Banks.
30. What is the significance of repo and reverse repo rates ?
31. Write a note on SARFAESI Act. (6×4=24 Marks)

SECTION – IV

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

32. Discuss the role played by money in a modern economy.
 33. Explain the major functions performed by Commercial Banks.
 34. Discuss the structure of co-operative banking in India. Explain the role played by Co-operative banks in the field of rural credit.
 35. Review various reforms implemented in Indian banking system on the basis of Narasimhan Committee. (2×15=30 Marks)
-



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D – 2494

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

ECONOMICS

Core Course – VII

EC-1542 : Macro Economics – II
(2015 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. What is inflation ?
2. Saving function.
3. APC.
4. Accelerator
5. Induced investment.
6. What do you mean by near money ?
7. What is LM curve ?
8. Transitory income.
9. Nominal interest rate.
10. Cost push inflation.

(10×1=10 Marks)

SECTION – II

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

11. Explain the concept of Demonstration effect.
12. Distinguish between gross investment and net investment.
13. Explain the concept of neutrality of money.
14. Write a note on Monetarism.
15. What is capital output ratio ?

P.T.O.

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16. Explain briefly the consumption puzzle.
17. Distinguish between galloping and hyper inflation.
18. What is automatic stabilization policy ?
19. What are the objectives of fiscal policy ?
20. What is money illusion ?
21. Explain Keynes effect.
22. Briefly explain the mechanism of open market operation. **(8×2=16 Marks)**

SECTION – III

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

23. Explain Friedman permanent income hypothesis.
24. Write on Absolute income hypothesis.
25. Explain the concept of inflationary gap with the help of diagram.
26. Give an account of the selective credit control measures.
27. Explain the scope of fiscal policy.
28. What are the subjective factors that influence consumption ?
29. Critically evaluate liquidity preference theory of interest.
30. What is meant by macroeconomic policy ? Explain the basic objectives of macroeconomic policy.
31. Explain the working of investment multiplier with the help of an example. **(6×4=24 Marks)**

SECTION – IV

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

32. Explain general equilibrium of goods and money market using IS-LM model.
33. Critically examine Life Cycle Theory of Consumption.
34. Explain the Cambridge version of the quantity theory of money. Is it an improvement over Fisher's quantity theory of money ?
35. What are the effects of inflation upon the economic system ? What methods can the Government use to control inflation ? **(2×15=30 Marks)**



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D – 2495

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme Under CBCSS

Economics

Core Course : VIII

**EC – 1543 : ECONOMICS OF GROWTH AND DEVELOPMENT
(2015 Admn.)**

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. Economic Development.
2. GNP Per Capita.
3. Balanced Growth.
4. Sustainable development.
5. Social overhead capital.
6. Inequality.
7. Development Gap.
8. Capital formation.
9. Absolute Poverty.
10. Limits to growth.

(10×1=10 Marks)

P.T.O.



SECTION – II

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

11. What are the different methods for measuring economic development ?
12. Distinguish between economic growth and development.
13. Explain Gender Development Index.
14. What is Sen's capability approach of development ?
15. Explain the indicators of underdevelopment.
16. Examine the role of population growth in the development process.
17. What is meant by big push ?
18. Explain Malthusian theory of population.
19. Explain the concept of Golden Age.
20. What is knife edge equilibrium ?
21. Write a note on Lorenz curve.
22. What is meant by stationary state ?

(8×2=16 Marks)

SECTION – III

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

23. What is the basic idea of Boeke's Social Dualism ?
24. Explain the factors that contribute to economic development of a country.
25. Examine the major effects of development on environment.
26. What is Hirschman strategy of unbalanced growth ?
27. Write Gunnar Myrdal's Theory of Circular Causation.



28. Explain the concept of endogenous growth.
29. Distinguish between warranted rate of growth and natural rate of growth.
30. Write on the basic characteristics of LDCs.
31. Explain Kuznets Hypothesis.

(6×4=24 Marks)

SECTION – IV

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

32. Diagrammatically explain Lewis model of economic development with unlimited supplies of labour.
33. Critically examine the Big Push theory.
34. Explain the concept and important determinants of economic growth. Discuss the major obstacles to economic growth of a country.
35. Explain the Harrod-Domar model of economic growth.

(2×15=30 Marks)



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D – 2496

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
First Degree Programme under CBCSS
ECONOMICS

Core Course : IX
EC-1544 : Indian Economy
(2015 Admn.)

Max. Marks : 80

Time : 3 Hours

SECTION – I

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

1. Food security
2. Disinvestment policy
3. Flexible exchange rate
4. Land reforms
5. Mixed economy
6. Green revolution
7. Social infrastructure
8. MUDRA bank
9. Inclusive development.
10. Black money.

(10×1=10 Marks)

SECTION – II

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

11. What is meant by demographic dividend ?
12. What is occupational structure ?
13. What are the reasons for rural-urban migration ?
14. Cottage industries in India.
15. Features of second generation reforms.

P.T.O.

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16. What is population census ?
17. Changes in cropping pattern of India.
18. Problems of institutional credit in agricultural finance.
19. What is meant by poverty line ?
20. What were the objectives of economic planning in India ?
21. Differentiate between FDI and FPI.
22. Write a note on NITI Aayog.

(8×2=16 Marks)

SECTION – III

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

23. Explain the role of public sector in Indian economy.
24. Briefly explain the trends infant mortality rate.
25. Discuss the problems of Indian agriculture.
26. Explain demographic transition of India.
27. What are the major fiscal reforms implemented in the country since 1991 ?
28. Discuss the problems and remedies of MSME sector.
29. Explain the achievements of Indian planning.
30. Discuss the significance of service sector in Indian economy.
31. What are the major issues in financing infrastructure in the country ?

(6×4=24 Marks)

SECTION – IV

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

32. Discuss various poverty alleviation programmes implemented in India.
33. Evaluate the merits and demerits of Green revolution.
34. Explain the objectives and features of second generation reforms.
35. Examine the trends in urbanisation in India. What are the special features of urbanisation in the country ?

(2×15=30 Marks)



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D – 2497

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
First Degree Programme under CBCSS
ECONOMICS
Core Course – X
EC – 1545 : Public Economics
(2015 Admn.)

Max. Marks : 80

Time : 3 Hours

SECTION – I

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

1. Sinking fund.
2. Deficit financing.
3. Capital levy.
4. Tax avoidance.
5. Incidence of tax.
6. Compensatory fiscal policy.
7. Merit goods.
8. Performance budgeting.
9. Taxable capacity.
10. Free rider problem.

(10×1=10 Marks)

SECTION – II

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

11. Explain the principles of public debt management.
12. What are the objectives of taxation ?
13. Distinguish between impact, incidence and shifting of a tax.
14. What are the merits and demerits of direct taxation ?

P.T.O.



15. Explain Wiseman-Peacock hypothesis of public expenditure.
16. Explain the characteristics of Zero Based Budgeting.
17. Define Tax. What are the canons of taxation ?
18. What is Colin-Clark hypothesis ?
19. Explain the problems of local finance.
20. Distinguish between Specific and Advalorem Tax.
21. What is Laffer curve ?
22. Explain Planning Programming Budgeting System (PPBS).

(8×2=16 Marks)

SECTION – III

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

23. What are the similarities between public finance and private finance ?
24. What are the characteristics of a good tax system ?
25. Explain Balanced budget and Unbalanced budget.
26. What are the instruments of fiscal policy ?
27. Explain the principles of federal finance.
28. Distinguish between Gadgil formula and Mukherjee formula.
29. Distinguish between private goods and social goods.
30. Distinguish between Consolidated Fund and Contingency Funds.
31. Briefly explain the concept of market failure.

(6×4=24 Marks)

SECTION – IV

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

32. Discuss the usefulness of Deficit financing as a technique of economic development.
33. Discuss the effects of public expenditure on production, distribution and economic activity.
34. Explain the principle of maximum social advantage and how maximum social advantage is achieved.
35. What is Finance Commission ? Examine the major recommendations and functions of Finance Commission.

(2×15=30 Marks)



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D – 2498

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017

First Degree Programme under CBCSS

ECONOMICS

Open Course – I

EC-1551 : Human Resource Management (HRM)

(2015 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

Very short answer questions. Answer **all** questions. (**One mark each**)

1. Human resource management
2. Human resource development
3. Placement
4. Workers Participation in Management (WPM)
5. Bargaining strategies
6. Meaning of Human Resource Planning
7. Distributive bargaining
8. Steps in training
9. Induction
10. Industrial relation.

(1×10=10 Marks)

Short answer questions. Answer **any eight** questions. (**Two marks each**)

11. Human resource planning
12. Objectives of human resource management
13. Strategic human resource management
14. Objectives of training

P.T.O.



15. Selection procedure
16. Methods of recruitment
17. Disciplinary procedure
18. What are the functions of collective bargaining ?
19. Types of promotion
20. Industrial relation
21. Industrial democracy
22. Distinguish between promotion and demotion.

(8×2=16 Marks)

Short essay questions. Answer **any six** questions. (Four marks each)

23. Examine the meaning and importance of Human Resource Management.
24. Distinguish between HRM and HRD.
25. What are objectives of human resource planning ?
26. What are the training methods ?
27. Explain the labour theory of value.
28. Examine the workers participation in management in India.
29. Distinguish between lay off and retrenchment.
30. Explain the need for human resource planning in economic development.
31. Distinguish between selection and recruitment.

(6×4=24 Marks)

Essay questions. Answer **any two** questions. (Fifteen marks each)

32. Examine the objectives, scope and functions of human resource management.
33. Examine the trends of working age population in India.
34. Explain the meaning, objectives and steps in human resource planning.
35. Examine the importance and objectives of collective bargaining. Explain the stages of bargaining process.

(2×15=30 Marks)



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D – 2505

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

First Degree Programme Under CBCSS

MATHEMATICS

Core Course

MM 1541 : Real Analysis – I

(2013 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. If $a.b = 0$; $a, b \in \mathbb{R}$, prove that either $a = 0$ or $b = 0$.
2. State Bernoulli's inequality.
3. State triangle inequality of real numbers.
4. Define convergence of a sequence of real numbers.
5. Give a bounded sequence that is not a Cauchy sequence.
6. State Monotone subsequence theorem.
7. Define a contractive sequence.
8. State the Cauchy criterion for the convergence of a series.
9. Find the cluster points of the set $A = (0, 2)$.
10. Define left hand limit of a function.

P.T.O.



SECTION - II

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

11. Determine the set A of all real numbers x such that $x^2 + x > 2$.
12. If $a \in \mathbb{R}$ is such that $0 \leq a < \varepsilon$ for every $\varepsilon > 0$, then $a = 0$.
13. Prove that if $c \geq 0$, then $|a| \leq c$ if and only if $-c \leq a \leq c$; $a, b, c \in \mathbb{R}$.
14. Let $a \in \mathbb{R}$. If x belongs to the neighbourhood $V_\varepsilon(x)$ for every $\varepsilon > 0$, then $x = a$.
15. If $X = (x_n)$ is a convergent sequence of real numbers and if $x_n \geq 0$ for all $n \in \mathbb{N}$, then prove that $x = \lim (x_n) \geq 0$.
16. Prove that the sequence $((-1)^n)$ is not convergent.
17. Give an example of two divergent sequences X and Y such that their product $X.Y$ converges.
18. Prove that $\left(\frac{1}{n}\right)$ is a Cauchy sequence.
19. Prove that every convergent sequence of real numbers is a Cauchy sequence.
20. If the series $\sum x_n$ converges, prove that $\lim x_n = 0$.
21. Prove that the series $\sum_{n=1}^{\infty} \frac{1}{n^2 + n}$ converges.
22. Prove that $\lim_{x \rightarrow 0} \frac{1}{x}$ does not exist.

SECTION - III

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

23. State Algebraic properties of real numbers.
24. If x and y are real numbers with $x < y$, prove that there is a rational number r such that $x < r < y$.
25. If $I_n = [a_n, b_n]$; $n \in \mathbb{N}$ is a nested sequence of closed bounded intervals, prove that there exists a real number ξ such that $\xi \in I_n$ for all $n \in \mathbb{N}$.



26. Prove that the sequence (n) is divergent.
27. Let $X = (x_n)$ be a sequence of real numbers that converges to x and suppose $x_n \geq 0$. Prove that the sequence $(\sqrt{x_n})$ of positive square roots converges and $\lim(\sqrt{x_n}) = \sqrt{x}$.
28. State and prove Bolzano-Weierstrass Theorem.
29. Let (x_n) and (y_n) be sequences of real numbers such that $x_n \leq y_n \forall n \in \mathbb{N}$. Prove that if $\lim(x_n) = +\infty$, then $\lim(y_n) = +\infty$.
30. Let $f: A \rightarrow \mathbb{R}$ be a function and c a cluster point of A . Prove that f can have only one limit at c .
31. Show that $\lim_{x \rightarrow 0} \sin \frac{1}{x}$ does not exist.

SECTION - IV

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

32. Prove the following :

- a) If $x \in \mathbb{R}$, then there exists $n_x \in \mathbb{N}$ such that $x < n_x$.
- b) If $S = \left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$, then $\inf S = 0$.
- c) If $t > 0$, there exists $n_t \in \mathbb{N}$ such that $0 < \frac{1}{n_t} < t$.

33. a) State and prove squeeze theorem for sequences.
b) State and prove Monotone Convergence Theorem.

34. a) Let $p > 0$. Prove that the series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ converges if and only if $p > 1$.
b) State and prove Raabe's Test.

35. a) Prove that a number $c \in \mathbb{R}$ is a cluster point of a subset A of $\mathbb{R}$ if and only if there exists a sequence (a_n) in A such that $\lim(a_n) = c$ and $a_n \neq c \forall n \in \mathbb{N}$.
b) State and prove the sequential criterion for limits of a function.
-



(Pages : 4)

D – 2507

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme Under CBCSS

MATHEMATICS

Core Course : VI

MM1543 : Differential Equations and their Applications
(2013 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer **all** questions from this Section. **Each** question carries 1 mark.

1. Find the integral curve of the equation $xy' = 1$ passing through $(1, 0)$.
2. Find the orthogonal trajectories of the curves $xy = c$.
3. Write the order of the differential equation $\frac{d^3y}{dx^3} + 2\left(\frac{d^2y}{dx^2}\right)^2 - \frac{dy}{dx} + y = 0$.
4. Find the general solution of the differential equation $y' = e^x - x$.
5. Find an integrating factor for the differential equation $ydx + (x^2y - x)dy = 0$.
6. If $y_1 = x$ is a solution of $x^2y'' + xy' - y = 0$. Find a second linearly independent solution.
7. Write the auxiliary equation of $y'' + y' - 6y = 0$.
8. Find the general solution of $y'' - 8y = 0$.
9. Find the Wronskian of $y_1 = x$ and $y_2 = x^2$.
10. Find the Laplace transform of $f(x) = 5e^{-2x} - 3 \sin 4x$, $x \geq 0$. (10×1=10 Marks)

P.T.O.



SECTION - II

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

11. If the air resistance acting on a falling body of mass m exerts a retarding force proportional to the square of the velocity, $\frac{dv}{dt} = g - v^2$. Where $c = k/m$ $v(0) = 0$, find v as a function of t . What is the terminal velocity in this case?
12. Evaluate $\int_0^{\infty} \frac{\sin x}{x} dx$.
13. Determine $N(x, y)$ such that the equation $(x^3 + xy^2)dx + N(x, y)dy = 0$ is exact.
14. Prove that two solutions of the homogeneous equation $y'' + P(x)y' + Q(x)y = 0$ on an interval $[a, b]$ are linearly dependent if they have a common zero x_0 in the interval.
15. Show that $L(x \cos ax) = \frac{p^2 - a^2}{(p^2 + a^2)^2}$.
16. Transform the equation $y'' + 2y' + 2y = 0$ into a system of first order equations.
17. Solve the differential equation $\frac{dy}{dx} + \frac{1}{2}y = \frac{1}{2}e^{x/3}$.
18. Show that $y = c_1 \sin x + c_2 \cos x$ is the general solution of $y'' + y = 0$ on any interval and find the particular solution for which $y(0) = 2$ and $y'(0) = 3$.
19. Solve the Euler equation $x^2 y'' + xy' + y = 0$.
20. Using Picard's method solve $y' = y$, $y(0) = 1$.



21. Find $L(u(x - a))$ where a is a positive number and $u(x)$ is the unit step function.
22. Solve the initial value problem $y' = y^2$, $y(0) = 1$ and determine the interval in which the solution exist. (8x2=16 Marks)

SECTION - III

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

23. Find an integrating factor for the equation $(3xy + y^2) + (x^2 + xy)y' = 0$ and then solve the equation.
24. Solve the system $\frac{dx}{dt} = x + y$ and $\frac{dy}{dt} = 4x - 2y$.
25. Show that $\int_0^\infty e^{-s^2} ds = \frac{\sqrt{\pi}}{2}$.
26. A rabbit starts at the origin and runs up the y-axis with speed a . At the same time a dog running with speed b , starts at the point $(c, 0)$ and pursues the rabbit. What is the path of the dog ?
27. Find the general solution of $y'' - 2y' - 3y = 3e^{2x}$.
28. Find a particular solution of $y'' + y = \operatorname{cosec} x$.
29. Show explicitly that $L(x^{-1})$ doesn't exist.
30. Using Laplace Transform solve $y'' + 4y = 4x$ that satisfies the initial conditions $y(0) = 1$ and $y'(0) = 5$.
31. Show that $L\left[x^{-\frac{1}{2}}\right] = \sqrt{\frac{\pi}{2}}$. (6x4=24 Marks)



SECTION - IV

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

32. Find the general solution of $y'' = 3y' - 4y = 3e^{2x} + 2 \sin x - 8e^x \cos 2x$.

33. Find the solution of the initial value problem $y^{(4)} - y = 0$, $y(0) = 0$, $y'(0) = 1$, $y''(0) = 0$, $y'''(0) = 0$.

34. Solve Bessel's equation of order zero $xy'' + y' + xy = 0$, $y(0) = 1$.

35. a) Solve the integral equation $y(x) = e^x \left[1 + \int_0^x e^{-t} y(t) dt \right]$.

b) State the convolution theorem and use it to find the inverse Laplace transform

(2×15=30 Marks)

of $H(p) = \frac{a}{p^2(p^2 + a^2)}$.



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(First Degree Programme Under CBCSS)
Mathematics
Core Course – VII
MM 1544 : NUMERICAL METHODS
(2013 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – I

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

1. State the location of roots theorem.
2. Define relative error.
3. Explain bisection method to find a root of the equation $f(x) = 0$.
4. When a linear system of equations $AX = B$ is said to be consistent ?
5. Name a step-by-step method for solving a first order differential equation.
6. Define an integral equation.
7. How to obtain a forward difference table for a given set of values y_0, y_1, y_2, y_3 ?
8. Name a formula that is used for interpolation with unequal intervals.
9. State Newton's backward difference interpolation formula.
10. Write down the Trapezoidal rule for numerical integration.

P.T.O.



SECTION – II

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

11. Define relative and percentage errors.
12. Sum the numbers 105.5, 27.25, 6.56, 0.1568, 0.000256, 208.6, 0.0235, 0.538 and 0.0571 where each number is correct to the digits given.
13. Find n such that the series $\tan^{-1}x = x - \frac{x^3}{3} + \frac{x^5}{5} - \dots (-1)^{n-1} \frac{x^{2n-1}}{2n-1} + \dots$ determines $\tan^{-1}(1)$ correct to eight significant digits.
14. Find a real root of the equation $f(x) = x^3 - x - 1 = 0$ by bisection method.
15. Explain the iteration method for finding a root of the equation $f(x) = 0$.
16. Write down Newton-Raphson method.
17. Prove that $\Delta - \nabla = \delta^2$.
18. Using Newton's forward interpolation formula, find the sum $S_n = 1^3 + 2^3 + \dots + n^3$.
19. Write down Trapezoidal rule for numerical integration.
20. Explain Gaussian elimination method for solving a system of three equations in three variables.
21. Explain Taylor's method of solving a first order differential equation.
22. Using Runge-Kutta method of second order find $y(0.1)$, when $y' = -y$; $y(0) = 1$. Take $h = 0.1$.

SECTION – III

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

23. Find a real root of the equation $x^3 - 3x + 1 = 0$ lying between 1 and 2 correct to three places of decimal by using bisection method.
24. Use Newton-Raphson method to obtain a root of $f(x) = xe^x - 2 = 0$.



25. Given that the equation $x^{22} = 69$ has a root between 5 and 8. Use the method of Regula-Falsi to determine it correct to three significant figures.
26. Solve $2x + y - z = -1$, $x - 2y + 3z = 9$; $3x - y + 5z = 14$ by Gaussian elimination method.
27. Given $\frac{dy}{dx} = x - y^2$ and $y(0) = 1$. Compute $y(0.1)$ correct to four decimal places, using Taylor series for $y(x)$.
28. Derive Euler's method to solve a first order differential equation. Also explain how we can improve the Euler's method.
29. Find the missing term in the following table.

x	1	2	3	4	5
y	2	5	7	?	32

30. Find the value of x for which $y = 7$, using Lagrange's inverse formula.

x	1	3	4
y	4	12	19

31. Write a short note on errors in Numerical Differentiation.

SECTION - IV

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

32. a) Use the method of iteration to find a root of the equation $2x = \cos x + 3$ correct to three decimal places. Take $x_0 = \frac{\pi}{2}$.
- b) Explain Aitkens Δ^2 - process to improve the rate of convergence in iteration method.
33. a) Explain the Jacobi method of solving a system of linear equations.
- b) Solve $28x + 4y - z = 32$; $2x + 17y + 4z = 35$; $x + 3y + 10z = 24$ by Jacobi method.



34. a) Given that $y' = \frac{y-x}{y+x}$; $y(0) = 1$, use Picard's method to find $y(0.1)$.
- b) Given that $\frac{dy}{dx} = 1 + xy$; $y(0) = 2$, Use Runge-Kutta method of order 4 to find $y(0.1)$ and $y(0.2)$. Take $h = 0.1$.

35. a) Derive Lagrange's Interpolation Formula.

- b) The velocity v of a particle at distance s from a point on its path is given below :

s in meters	0	10	20	30	40	50	60
v in m/s	47	58	64	65	61	52	38

Estimate the time taken to travel 60 meters by using Simpson's $\frac{1}{3}$ rule.



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme under CBCSS
MATHEMATICS
Core Course VIII
MM 1545 Computer Programming – I
(2013 Admn.)

Time: 3 Hours

Max. Marks : 80

SECTION – I

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

1. Write the conditional branching form.
2. What is a binary search tree ?
3. What is queue ?
4. What is stack ?
5. What do you mean the shell *bash* ?
6. Write the syntax of declaring a variable.
7. What is string ?
8. Write the syntax of two-dimensional array.
9. What is a pointer constant ?
10. A structure variable can be initialized at _____ ?

P.T.O.



SECTION – II

Answer **any 8** questions from among questions **11 to 22**. **Each** question carries **2** marks.

11. Explain two types of iterations.
12. What is the use of directory */home* ?
13. What is the use of */s*?
14. Write the logical operators in C.
15. Explain the DO statement.
16. Write a C program to find the average of *n* numbers.
17. Write the syntax of *printf* statement.
18. Explain *strcat()* function.
19. Write a structure *personal* to hold the following informations name, day, month, year, salary.
20. Explain how to initialize pointer variables.
21. Write a C program to find the largest of two numbers.
22. Explain comparison of structure variables.

SECTION – III

Answer **any 6** questions from among the questions **23 to 31**. **Each** question carries **4** marks.

23. Write the subroutine *search-for X*.
24. Explain "Goto" Statement.
25. Explain the shells *zsh*, *tcsh*.
26. Explain gcc features.



27. Write the rules for decrement (--) operator.
28. Explain the field specification for inputting character strings.
29. Write a C program to arrange 5 numbers in descending order.
30. Explain how to declare structure variables.
31. Write a C program to print the address of a variable along with its value.

SECTION – IV

Answer **any 2** questions from among the questions **32 to 35**. **Each** question carries **15 marks**.

32. Explain the algorithm second-visit-traversal-of T with example.
 33. Explain if else statement with example.
 34. Write a C program of find the sum of two matrices.
 35. Explain pointers and arrays.
-



Reg. No. :

Name :

Fifth Semester B.A./B.Sc./B.Com. Degree Examination, December 2017
First Degree Programme Under CBCSS

MATHEMATICS

Open Course

MM – 1551.1 : Operations Research
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Give an example of a linear programming problem.
2. What are the main features of the standard form of a linear programming problem ?
3. Convert the constraint $x_1 - x_2 + x_3 \geq 2$ into equality using slack or surplus variable.
4. Define slack variable.
5. Define basic feasible solution.
6. What are transportation problems ?
7. Which among the following is a superior method over the other to find an initial solution to transportation problems ? Northwest Corner Rule or Vogel's Approximation Method.
8. How can an unbalanced transportation problem, where the total supply exceeds the total demand be converted to a standard problem ?
9. Expand CPM.
10. Define an event in a project.

(10×1=10 Marks)

SECTION – B

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

11. Use the graphical method to solve the following LP problem :

$$\begin{aligned} \text{Maximize } Z &= x_1 + 2x_2 \\ \text{Subject to } x_1 + 2x_2 &\leq 10 \\ x_1 + x_2 &\geq 1 \\ x_2 &\leq 4 \\ x_1, x_2 &\geq 0 \end{aligned}$$

P.T.O.

12. Write in standard form :

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

$$\text{Subject to } x_1 \leq 5$$

$$x_1 + 2x_2 \leq 10$$

$$x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

13. Represent the following LPP in matrix – vector notation :

$$\text{Maximize } Z = x_1 - 2x_2 + 3x_3 - 3x_4$$

$$\text{Subject to } x_1 + x_2 + x_3 - x_4 + x_5 = 7$$

$$x_1 - x_2 + x_3 - x_4 - x_6 = 2$$

$$-3x_1 + x_2 + 2x_3 - 2x_4 = 5$$

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 0, x_4 \geq 0, x_5 \geq 0, x_6 \geq 0$$

14. What are the general steps to be followed while solving LPP by Simplex Method ?
15. What are the basic components of a linear programming problem ?
16. What is an assignment problem ? How does it differ from a transportation problem ?
17. Is it advisable to solve an assignment problem using transportation algorithm ? Why ?
18. Write the steps involved in the Vogel's approximation rule for finding an initial basic feasible solution to a transportation problem.
19. Define penalty in Vogel's approximation method.
20. Find an optimal assignment of 2 jobs and 2 machines using Hungarian Method when the cost of assignment is given by the following table.

	J ₁	J ₂
M ₁	12	30
M ₂	18	13

21. State two applications of CPM.
22. Define critical events and critical jobs.

(8×2=16 Marks)

SECTION – C

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

23. A company sells two different products A and B, making a profit of Rs. 40 and Rs. 30 per unit on them, respectively. They are produced in a common production process and are sold in two different markets. The production process has a total capacity of 3,000 man-hours. It takes three hours to produce a unit of A and one hour to produce a unit of B. The market has been surveyed and company officials feel that the maximum number of units of A that can be sold is 8000 units and that of B is 12000 units. Subject to these limitations products can be sold in any combination. Formulate this problem as an LP model to maximize profit.



24. Use the graphical method to solve the following LP problem :

$$\text{Minimize } Z = -x_1 + 2x_2$$

$$\text{Subject to } -x_1 + 3x_2 \leq 10$$

$$x_1 + x_2 \leq 6$$

$$x_1 - x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

25. Solve the following LPP using Simplex method :

$$\text{Maximize } Z = 4x_1 + 3x_2$$

$$\text{Subject to } 2x_1 + x_2 \leq 1000$$

$$x_1 + x_2 \leq 800$$

$$x_1 \leq 400$$

$$x_2 \leq 700$$

$$x_1, x_2 \geq 0$$

26. Describe the transportation problem with its general mathematical formulation.
27. Use North-West Corner method to find an initial basic feasible solution to the following transportation problem.

	M ₁	M ₂	M ₃	M ₄	Warehouse Capacity
W ₁	11	13	17	14	250
W ₂	16	18	14	10	300
W ₃	21	24	13	10	400
Market Demand	200	225	275	250	

28. Obtain an initial basic feasible solution to the following transportation problem using the Vogel's Approximation Rule.

	D ₁	D ₂	D ₃	D ₄	Supply
S ₁	19	30	50	10	7
S ₂	70	30	40	60	9
S ₃	40	8	7	20	18
Demand	5	8	7	14	

29. 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	J ₄
M ₁	10	9	7	8
M ₂	5	8	7	7
M ₃	5	4	6	5
M ₄	2	3	4	5

30. What are dummy warehouses and dummy markets ? When are they used and why ?
31. Consider a project with 7 jobs A, B, C, D, E, F and G having the following job sequence :
Job A precedes B and C, Jobs C and D precede E, Job B precedes D, Jobs E and F precede G. Draw the project network.
(6×4=24 Marks)

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

32. Solve the following LPP using Simplex Method.

$$\text{Maximize } Z = 7x_1 + 5x_2$$

$$\text{Subject to } x_1 + 2x_2 \leq 6$$

$$4x_1 + 3x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

33. Determine an initial basic feasible solution to the following transportation problem using Vogel's Approximation Method.

	D ₁	D ₂	D ₃	D ₄	Availability
S ₁	1	2	1	4	30
S ₂	3	3	2	1	50
S ₃	4	22	5	9	20
Demand	20	40	30	10	

34. Solve the Assignment problem.

	I	II	III	IV	V
A	1	3	2	3	6
B	2	4	3	1	5
C	5	6	3	4	6
D	3	1	4	2	2
E	1	5	6	5	4

35. A project consisting of nine jobs is given with the precedence relations and time durations as follows :

Job	Predecessors	Time 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.
- Determine the project schedule.

(2×15=30 Marks)



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D – 2513

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

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

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

1. What is a particle ? Can atom or earth can be treated as a particle explain ?
2. State Newton's first law of motion.
3. What is an non inertial frame ?
4. Deduce the conservation theorem of linear momentum for a particle.
5. What are transformation equations ?
6. What is non-holonomic constraints ?
7. What is Cyclic coordinates ?
8. Explain special theory of relativity.
9. What is Coriolis force ?
10. What do you mean by degrees of freedom ?

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. State and prove D'Alembert's principle.
12. State and prove conservation theorem for angular momentum for a system of N particles.
13. Define Hamiltonian function H.
14. Explain centre of mass systems.
15. Explain general features of motion.
16. Give the physical significance of Hamilton's principle for a conservation system.
17. Derive equation of motion for a particle.
18. Explain inverse square law of force.
19. Discuss the consequences of Lorentz transformation regarding the lengths of the bodies.
20. Discuss energy momentum four vector.
21. What are fictitious forces ?
22. State and prove work energy theorem. (8×2=16 Marks)

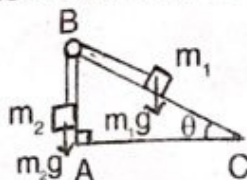
SECTION – C

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

23. If $F = (2xy + z^2) \mathbf{i} + x^2 \mathbf{j} + 2xz \mathbf{k}$ Newton, then show that it is conservative. Calculate the amount of work done by this force in moving a particle from (0, 4, 8) to (5, 2, 7) m.
24. Determine the number of degrees of freedom of the following cases :
 - i) A rigid body moving in space with one point fixed.
 - ii) A rigid body rotating about a fixed axis in space.



25. An inextensible string of negligible mass hanging over a smooth peg B connects one mass m_1 on the frictionless inclined plane of angle θ to another mass m_2 .



- Using D'Alembert's principle, prove that the masses will be in equilibrium if $\sin \theta = m_2/m_1$.
26. Obtain the equation of motion of a simple pendulum by using Hamiltonian method and hence deduce the formula for its time period for small amplitude oscillations.
27. Describe the Hamiltonian and Hamilton's equations for an ideal spring mass arrangement.
28. A meson has a speed $0.8c$ relative to the ground. Find how far the meson travels relative to the ground. If its speed remains constant and the time of its flight, relative to the system, which is at rest, is 2×10^{-8} cm.
29. A clock keeps correct time. With what speed should it be moved relative to an observer so that it may seem to lose 2 minutes in 24 hours ?
30. Calculate the speed of an electron which has kinetic energy 2 MeV.
31. Find the energy in electron volts released when a neutron decays into a proton and an electron. (6x4=24 Marks)

SECTION - D

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

32. Derive Lagrange's equation from D'Alemberts principle.
33. Establish Hamiltonian function for two dimensional harmonic oscillator and the equation of the motion for it.
34. Explain Kepler's laws of planetary motion and their deduction.
35. Describe the Michelson-Morley's experiment. What was the purpose of this experiment and what was the conclusion ? (2x15=30 Marks)
-

Reg. No. :

2013

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme under CBCSS

PHYSICS

Core Course – VI

PY 1542 : Quantum Mechanics

(2013 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.

1. Explain deBroglie relation.
2. Explain Hamiltonian function.
3. Write a note on statistical interpretation of probability.
4. Explain expansion theorem.
5. State correspondence principle.
6. What is discrete and continuous spectrum ?
7. What is co-ordinate representation ?
8. Explain the principle of super position.
9. When do you say two functions are orthonormal ?
10. Write down any two applications of uncertainty relation.

(10×1=10 Marks)

P.T.O.

SECTION – B

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

11. Prove that commuting operators have common set of eigen functions.
 12. Explain quantum theory of specific heat.
 13. Define a Hermitian operator. Show that any two eigen functions of a Hermitian operator that belong to different eigenvalues are orthogonal.
 14. Write a note on expectation value.
 15. What are stationary states ? In stationary states, show that the probability of current density is constant in time.
 16. Show that the velocity of a particle and the group velocity of the corresponding wave packet are the same.
 17. How particle nature of radiation was confirmed by the photoelectric effect and Compton effect ?
 18. Write a note on wave packet.
 19. What is a linear operator ?
 20. Explain photoelectric effect and its conclusions.
 21. Explain Wilson-Sommerfeld quantization rule.
 22. Outline Dirac's bra and ket notations.
- (8×2=16 Marks)

SECTION – C

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

23. Calculate the maximum wavelength that hydrogen in its ground state can absorb. What would be the next maximum wavelength ?
24. What potential difference must be applied to stop the fastest photoelectrons emitted by a surface when electromagnetic radiation of frequency 1.5×10^{15} Hz is allowed to fall on it. The work function of the surface is 5 eV.

25. Show that the phase velocity of relativistic electron is $v_p = c \left[1 + m_0^2 c^2 \lambda^2 / h^2 \right]^{1/2}$, where λ is its de Broglie wavelength.
26. Show that Cartesian coordinates (r_1, r_2, r_3) and the Cartesian components of angular momentum (L_1, L_2, L_3) obey the commutation relation. $[L_k, r_l] = i\hbar r_m$.
27. If A and B are Hermitian operators, show that $(AB + BA)$ is Hermitian and $(AB - BA)$ is not Hermitian.
28. Show that the linear momentum is not quantised.
29. Write the time dependent Schrodinger equation for a free particle in the momentum space and obtain the form of the wave function.
30. Show that the energy and wave function of a particle in a square well of infinite depth V_0 reduces to the energy and wave function of square well with rigid walls in the limit $V_0 \rightarrow \infty$.
31. A harmonic oscillator is in the ground state i) where is the probability density maximum? What is the value of maximum probability density? (6×4=24 Marks)

SECTION – D

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

32. Discuss Bohr atom model. Derive an expression hydrogen spectrum.
33. Deduce time dependent Schrödinger equation for a free particle.
34. Outline the different postulates of quantum theory.
35. Define the uncertainty (ΔA) in the measurement of dynamical variable. State and explain the general uncertainty relation. (2×15=30 Marks)



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

First Degree Programme under CBCSS

PHYSICS

Core Course – VII

PY 1543 : Electronics

(2013 Admission Onwards)

Time : 3 Hours

Marks : 80

SECTION – A

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

1. How much is the maximum rectifying efficiency of a full wave rectifier ?
2. What is regulated power supply ?
3. What is the current gain for a BJT with $I_B = 50 \mu A$ and $I_C = 2 mA$?
4. Give the Barkhausen condition for oscillations.
5. Define modulation index.
6. What is the input impedance of an ideal op-amp ?
7. Why a capacitor filter is better than the inductor filter ?
8. How much is the maximum efficiency of a direct coupled class A transistor power amplifier ?
9. Define CMRR.
10. The gate-source junction of a JFET has to be biased in which direction ? (10x1 = 10 Marks)



SECTION – B

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

11. What is meant by extrinsic semiconductors ?
 12. What is the advantage of a bridge rectifier over a full wave rectifier ?
 13. What is meant by the Beta cut off frequency ?
 14. What is a Triac ?
 15. Distinguish between oscillators and amplifiers.
 16. Discuss the voltage divider method of biasing a transistor.
 17. Explain the working of Zener voltage regulator.
 18. Give the schematic symbol of N-channel and P-channel FET.
 19. What happens to the input and output resistances of an amplifier when a negative voltage series feedback is used ?
 20. Explain the term frequency response of an amplifier. What are half-power frequencies ?
 21. What are upper and lower side frequencies in AM ?
 22. What is a class B amplifier ?
- (8×2 = 16 Marks)

SECTION – C

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

23. Convert each of the following ratio into their decibel values
 - i) $P_o/P_i = 250$
 - ii) $P_o/P_i = 0.5$
 - iii) $V_o/V_i = 10$ and $V_o/V_i = 0.707$.
24. In a CB connection, current amplification factor is 0.8. If the emitter current is 1mA, determine the value of base current.
25. Draw the circuit diagram of a Colpitts oscillator with labels on the components. Give the expression for its frequency.
26. Draw the DC load line for a CE circuit with $V_{CC} = 25 \text{ V}$, $R_C = 10 \text{ K}\Omega$ and $R_B = 2.5 \text{ M}\Omega$. Mark the Q point on it. Assume $\beta = 100$ and neglect V_{BE} .



27. The peak-to-peak value of an AM voltage has a maximum value of 10V and a minimum value of 4V. What is the percentage modulation and the amplitude of the unmodulated carrier ?
28. A half-wave rectifier is used to supply 20 V d.c. to a resistive load of 1000Ω . The diode has a resistance of 10Ω . Calculate the a.c. voltage required.
29. A 2mV, 5KHz sinusoidal signal is applied to the input of an OP-AMP integrator for which $R = 50K$ and $C = 2\mu F$. Find the output voltage.
30. An amplifier has a voltage gain of -120 . The feedback ratio is -0.05 . Find
- i) the voltage gain with feedback,
 - ii) the amount of feedback in dB.
 - iii) the output voltage of the feedback amplifier for an input voltage of 50 mV and
 - iv) the feedback factor.
31. Discuss about the transfer characteristic of JFET. (6x4 = 24 Marks)

SECTION - D

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

32. Draw the experimental set up to obtain the forward and reverse characteristics of a PN junction diode. Discuss the shape of the characteristics.
33. Describe the term feedback in amplifiers. Explain the principle of negative feedback and discuss the advantages of negative feedback.
34. What is modulation ? Discuss frequency modulation. Explain the term carrier swing.
35. What is an OpAmp ? State the characteristics of an ideal OpAmp. Describe the use of OpAmp as an adder. (2x15 = 30 Marks)
-



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D – 2516

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

First Degree Programme under CBCSS

PHYSICS

Core Course

**PY-1544 : Atomic and Molecular Physics
(2013 Admission)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. How many quantum numbers are required to completely specify the state of an electron ? Mention them.
2. Which type of coupling scheme exists in heavy atom ?
3. How many subshells are present in the M-shell ? What are they ?
4. Which type of molecules gives rise to a rotational spectrum ?
5. The angular momentum vector never points in the Z direction why ?
6. Explain why sodium and potassium exhibit similar properties.
7. Give two properties of x-rays.
8. What do you understand by spectral notation ?
9. Why are anti-stokes lines less intense than stokes lines ?
10. Explain the advantage of using Laser as a source in Raman spectrum measurement. **(10×1=10 Marks)**

SECTION – B

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

11. State Pauli Exclusion principle and give its application.
12. What is the significance of stern-Gerlach experiment ?



(Pages : 3)

D – 2518

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme Under CBCSS
PHYSICS

Open Course
PY 1551.2 : Astronomy and Astrophysics
(2013 Admission Onwards)

Time : 3 Hours

Total Marks : 80

SECTION – A

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

1. According to Copernicus what is the center of the universe.
2. Define the Astronomical Unit.
3. What are asteroids ?
4. How can you define a star ?
5. Which are inferior planets ?
6. What causes the apparent westward motion of stars as seen from earth ?
7. How much is the surface temperature of sun ?
8. How much is a Mercurian year ?
9. Which is the largest satellite of Jupiter ?
10. Name the Galaxy cluster to which Milkyway belongs. **(10×1=10 Marks)**

P.T.O.



SECTION - B

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

11. Distinguish between the terms perihelion and aphelion.
12. Define the term big-bang.
13. State Hubble's law.
14. What is meant by CMBR ?
15. Which are the three different zones of earth's interior ?
16. Mention the difference between meteor and meteoroid.
17. Which are the colour indices of stars ?
18. Define Chandrasekhar limit.
19. What are the two main purposes of using optical telescopes ?
20. What is meant by cosmological inflation ?
21. Define constellations.
22. Which are the different branches of Astronomy ?

(8×2=16 Marks)

SECTION - C

Short essay/problems. Answer **any six** questions. **Each** question carries **4** marks.

23. State and explain Kepler's second law of planetary motion.
24. What causes the tail of a comet ?
25. Two stars differ in their magnitudes by 2.0. By how many times is one star brighter than the other ?
26. Even light cannot come out of Black hole. Why ?



27. Explain the concept of Dark matter.
28. What is meant by main sequence stars ?
29. Mention any four important observations of Galileo.
30. Distinguish between sidereal day and solar day.
31. Write a short note on the planet Saturn.

(6×4=24 Marks)

SECTION – D

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

32. Discuss the features of the geocentric model of the universe.
33. Describe the internal structure and atmosphere of sun.
34. Briefly discuss about the different celestial coordinate systems.
35. Define the term galaxy. Describe the classification of galaxies.

(2×15=30 Marks)



(Pages : 3)

D – 2522

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(First Degree Programme Under CBCSS)

Chemistry

Core Course

CH 1541 : PHYSICAL CHEMISTRY – I
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is meant by Collision frequency ?
2. What are Miller indices ?
3. Define Molality.
4. What is meant by colligative property ?
5. Calculate the work of reversible expansion of 1 mole of ideal gas at 25°C from 10 L to 20 L.
6. Define chemical potential.
7. Give the Gibbs-Duhem equation and explain the terms.
8. What is meant by enthalpy of neutralization ?
9. What are point groups ?
10. Define centre of symmetry.

(10×1=10 Marks)

P.T.O.



SECTION – B

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

11. Give the Maxwell-Boltzmann law of distribution of molecular velocities and explain the terms.
12. State the virial equation of state and explain the terms involved.
13. Sketch the (220) planes of a face centered cubic lattice.
14. Distinguish between Schottky and Frenkel defect.
15. What will be the nature of the value for van't Hoff factors when a solute undergoes association and dissociation in solution ?
16. How is molar refraction of a liquid related to its refractive index and density ?
17. List the symmetry elements of BF_3 molecule.
18. What are the applications of liquid crystals ?
19. Distinguish between the terms isothermal process and adiabatic process.
20. What is entropy ? Give its physical significance.
21. Using Carnot's cycle derive an expression for the efficiency of heat engine.
22. Give the Gibbs-Helmholtz equation and explain the terms. **(8×2=16 Marks)**

SECTION – C

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

23. Discuss the effect of temperature on the distribution of molecular velocities.
24. Derive Bragg's equation and explain its applications.
25. Show that $C_p - C_v = R$ for 1 mole of an ideal gas.
26. Describe with theory the Capillary rise method of determining surface tension of a liquid.



27. Determine the point group of NH_3 .
28. Discuss the criteria of equilibrium and spontaneity.
29. What is meant by the term fugacity ? How can it be determined ?
30. How are the liquid crystals classified ? Explain the structural features of each class.
31. Calculate the entropy change produced when 5 moles of an ideal gas expand reversibly from a volume 120 dm^3 at 300 K to a volume of 150 dm^3 at 400 K.
($C_v = 1.5 R$). (6×4=24 Marks)

SECTION – D

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

32. a) Discuss the powder method for the X-ray diffraction studies of crystals.
b) Explain the determination of structure of NaCl from the diffraction pattern.
 33. Discuss the methods used for the determination of critical constants of a gas.
 34. Derive the expression for Joule Thomson coefficient. Obtain the relation between Joule Thomson coefficient and inversion temperature.
 35. a) Derive the relation $\Delta T_b = K_b \times m$.
b) Explain any two methods for the determination of molecular mass of solutes. (2×15=30 Marks)
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(First Degree Programme under CBCSS)
CHEMISTRY
Core Course
CH 1542 : Inorganic Chemistry – III
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What is the unit of magnetic moment ?
2. Maximum oxidation of Os is _____
3. What is the co-ordination number of metal in $[\text{NiCl}_4]^{2-}$?
4. The number of unpaired electrons present in Fe^{2+} is _____
5. Give the IUPAC name of $\text{K}_4[\text{Fe}(\text{CN})_6]$.
6. What is Wilkinson's catalyst ?
7. The number of bridging CO present in $\text{Ir}_4(\text{CO})_{12}$ is _____
8. In haemoglobin iron is present in _____ oxidation state.
9. The purple colour of KMnO_4 is due to _____
10. Give an example for hexadentate ligand.

(10×1=10 Marks)

SECTION – B

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

1. What is an ambidentate ligand ? Give examples.

P.T.O.



12. Which has got greater tendency to form complexes lanthanides or actinides ? Why ?
13. Zn, cd and Hg are not considered as transition metals. Why ?
14. Enthalpies of atomisation of transition elements are higher than those of alkali and alkaline earth metals. Explain.
15. Define the term ligand. Give two examples.
16. What is the oxidation and co-ordination number of Co in $[\text{Co}(\text{en})_2(\text{H}_2\text{O})\text{CN}]^{2+}$?
17. State and explain 18 electron rule.
18. Give any three examples for iron protein.
19. How haemoglobin differ from myoglobin ?
20. $2\text{NaBH}_4 + 3\text{H}_3\text{PO}_4 \rightarrow \underline{\hspace{2cm}}$?

21. Explain why B-F bond is larger in BF_4^- than in BF_3 molecule.

22. Explain the following :

a) Chromium is a typical metal while mercury is a liquid metal.

b) Cobalt (III) is stable in aqueous solution but in the presence of strong ligands it is easily oxidised to cobalt (III).

(8×2=16 Marks)

SECTION – C

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

23. Comment on the oxidation state of lanthanides.
24. Explain why $[\text{CoF}_6]^{3-}$ is paramagnetic while $[\text{Co}(\text{NH}_3)_6]^{3+}$ is diamagnetic.
25. Write any four application of co-ordination compounds.
26. What are the factors that affect stability of metal complexes ?
27. Why Sm^{2+} , Eu^{2+} , Yb^{2+} ions in solutions are good reducing agents but an aqueous solution of Ce^{4+} is a good oxidising agent ?



28. How the d-d spectra differ from F-F spectra ?
29. Which are the different types of silicates ?
30. What are silicones ? Give their preparation and uses.
31. What are interhalogen compounds ?

(6×4=24 Marks)

SECTION - D

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

32. How lanthanides are extracted from monazite ?
33. Using crystal field theory, write the electronic configuration of the central metal atom and determine the magnetic moment value of
- 1) $[\text{CoF}_6]^{3-}$, $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$, $[\text{Co}(\text{CN})_6]^{3-}$
- 2) $[\text{FeF}_6]^{3-}$, $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$, $[\text{Fe}(\text{CN})_6]^{4-}$
34. Write a note on function and mechanism of dioxygen binding of haemoglobin and myoglobin.
35. a) What are carboranes ? How are they obtained ?
- b) Give an account of Zeolites and their uses.

(15×2=30 Marks)



(Pages : 3)

D – 2525

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(First Degree Programme Under CBCSS)
Open Course – I
CH 1551.1 : ESSENTIALS OF CHEMISTRY
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Write the electronic configuration of chromium ($z = 24$).
2. What are the possible values of quantum numbers l , if $n = 4$?
3. What are isotopes ? Give one example.
4. Name the purine bases found in RNA.
5. Name any two inorganic polymers.
6. Pick out homopolymers from the following Bakelite, Nylon 6, Nylon 66, PVC.
7. Write Pauli's exclusion principle.
8. What are tranquilizers ?
9. Name any two green house gases.
10. Define Hund's rule of maximum multiplicity. (10×1=10 Marks)

SECTION – B

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

11. State and explain Aufbau principle.
12. The second ionization energy of sodium is very high as compared to its first ionization energy. Why ?

P.T.O.



13. What are the different types of radio active rays ? How they can be distinguished ?
14. Explain what is vulcanization.
15. State and explain group displacement law.
16. What are the main sources of Vitamin K ? What are its functions ?
17. Distinguish between DNA and RNA.
18. What are dyes ? Give one example for a nitro dye.
19. Draw the structure of TNT and TNG.
20. What is rock dating ?
21. What is Eutrophication ?
22. Explain cleansing action of soaps. (8×2=16 Marks)

SECTION – C

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

23. Discuss the limitations of Bohr theory of atom.
24. Explain the term artificial ratio activity with suitable examples.
25. Write a short note on radio carbon dating.
26. How polymers are classified on the basis of their structure ?
27. What are enzymes ? Give two examples and characteristics of enzymes.
28. Write a short note on cortical hormones.
29. Discuss various factors affecting purity of water.
30. What is green house effect ? Explain its consequences.
31. Discuss the pollution of air by oxides of C, N and S and particulate matter. (6×4=24 Marks)



SECTION – D

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

32. Define the following and explain their trends in a period and in a group.
- Electron affinity
 - Electro negativity
 - Ionization energy
 - Atomic radii
33. i) Discuss the application of following polymers.
- Bakelite
 - Melamin
 - Nylon-6
- ii) Name two synthetic rubbers. Name their monomers and explain their structure and uses.
34. a) Explain the term hard soaps and soft soap.
- b) Explain the disadvantages of hard water. What are the different methods for removing hardness of water ?
35. Write short notes on :
- Acid rain
 - Pesticide pollution
 - Ozone layer depletion and its chemistry.
- (2×15=30 Marks)
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
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. State Bernoulli's inequality.
2. If $S = \{1 - (-1)^n : n \in \mathbb{N}\}$, find $\inf S$.
3. Give an example of a set in $\mathbb{R}$ such that its supremum exists but has no lower bounds.
4. State Squeeze theorem for sequence of real numbers.
5. Give an example of an unbounded sequence that has a convergent subsequence.
6. Show that the series $\sum_{n=1}^{\infty} \frac{1}{n^2 + n}$ is convergent.
7. Find all cluster points of the set $\left\{\frac{1}{n} : n \in \mathbb{N}\right\}$.
8. Show that $\lim_{x \rightarrow 0} x^{3/2} = 0$, for $x > 0$.
9. State Bolzano-Weierstrass theorem.
10. State Cauchy criterion for convergence of a series.



SECTION - 2

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

11. If $ab > 0$ then show that either (i) $a > 0$ and $b > 0$ or (ii) $a < 0$ and $b < 0$.
12. Determine the set $A = \{x \in \mathbb{R} : x^2 + x > 2\}$.
13. State completeness property of $\mathbb{R}$ and justify with an example.
14. Define nested intervals and give an example for the same.
15. Show that $\lim_{n \rightarrow \infty} \frac{1}{n} = 0$.
16. Show that a convergent sequence is bounded.
17. Establish the convergence of the sequence (x_n) , where $x_n = \frac{n}{2^n}$.
18. Show that a Cauchy sequence of real numbers is bounded.
19. Show that the series $\sum_{n=1}^{\infty} \frac{\cos n}{n^2}$ is convergent.
20. Find the limit of the sequence $\left(1 + \frac{1}{2n}\right)^n, n \in \mathbb{N}$.
21. Using $\varepsilon - \delta$ definition of limit show that $\lim_{x \rightarrow c} x = c$.
22. Show that $\lim_{x \rightarrow 0} \left(\frac{\sin x}{x}\right) = 1$.

SECTION - 3

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

23. Let $f(x) = \frac{2x^2 + 3x + 1}{2x - 1}$, where $2 \leq x \leq 3$. Determine a constant M such that $|f(x)| \leq M$ for all x satisfying $2 \leq x \leq 3$.
24. State and prove Archimedean property.



25. Let (x_n) be a sequence of positive real numbers such that $\lim \frac{x_{n+1}}{x_n} = L$. If $L < 1$, then show that (x_n) converges and $\lim x_n = 0$.
26. State and prove Monotone subsequence theorem.
27. Show that the geometric series $\sum_{n=1}^{\infty} r^n$ converges when $|r| < 1$.
28. State and prove Limit Comparison test.
29. Show that the series $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n+1}}$ is divergent.
30. Show that a number $c \in \mathbb{R}$ is a cluster point of a subset A of $\mathbb{R}$ if and only if there exists a sequence (a_n) in A such that $\lim (a_n) = c$ and $a_n \neq c$ for all $n \in \mathbb{N}$.
31. Prove that $\lim_{x \rightarrow 0} \left(\frac{\cos x - 1}{x} \right) = 0$.

SECTION - 4

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

32. i) State and prove Density Theorem.
ii) State and prove Nested Intervals Property of real numbers.
33. Let $X = (x_n)$ and $Y = (y_n)$ be sequences of real numbers converges to x and y respectively. Then show that $X + Y$ and $X.Y$ and converges to $x + y$ and xy respectively. Under suitable conditions in $Y = (y_n)$ and y further show that the quotient X/Y converges to x/y .
34. i) State and prove Cauchy's convergence criterion of a sequence.
ii) Show that every contractive sequence is a Cauchy sequence and is convergent.
35. i) Using $\varepsilon - \delta$ definition of limit establish that $\lim_{x \rightarrow c} \frac{1}{x} = \frac{1}{c}$.
ii) Let $f(x) = \frac{1}{e^x + 1}$ for $x \neq 0$. Show that the right-hand limit and left hand limit of $f(x)$ exist but they are unequal.
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

First Degree Programme Under CBCSS

MATHEMATICS

Core Course V

MM 1542 : Complex Analysis – 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. Show that $\text{Im}(iz) = \text{Re}(z)$.
2. Prove that $\text{Re } z \leq |z|$ and $\text{Im } z \leq |z|$.
3. Define a Cauchy sequence of complex numbers.
4. Define a closed set.
5. Represent geometrically the set $\{z/\text{Re } z > 0\}$.
6. Define an analytic polynomial.
7. Find the radius of convergence of the series $\sum_{n=0}^{\infty} z^{n^2}$.
8. Give the power series representation for $\cos z$.
9. Define a contour.
10. State Rectangle theorem.



PART - B

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

11. Find $\operatorname{Re} z$ and $\operatorname{Im} z$ for $z = \left(\frac{1}{2-3i} \right) \left(\frac{1}{1+i} \right)$.
12. Show that if z_1 and z_2 are complex numbers and $z_1 z_2 = 0$, then $z_1 = 0$ or $z_2 = 0$.
13. Prove that z is real if and only if $\bar{z} = z$.
14. Find the square roots of $-5 - 12i$.
15. Find the principal amplitude of $-i$.
16. Discuss the convergence of the series $\sum_{n=1}^{\infty} n z^n$.
17. Show that $|e^{i\theta}| = 1$.
18. Sketch the given set and determine whether it is a region : $|z - 2| > |z - 3|$.
19. Prove that a non-constant analytic polynomial cannot be real valued.
20. Prove the difference rule $\frac{d}{dz}[f(z) - g(z)] = \frac{d}{dz}[f(z)] - \frac{d}{dz}[g(z)]$.
21. Prove that $\sin(-z) = -\sin z$.
22. Find $\int_C \bar{z} dz$ where C is the upper half of the circle $|z| = 1$ from $z = -1$ to $z = 1$.

PART - C

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

23. Solve the equation $z^2 + z + 1 = 0$.
24. Let z_1, z_2 be two complex numbers. Prove that $|z_1 + z_2| \leq |z_1| + |z_2|$.
25. Show that the sequence $\left\{ \frac{n}{n+i} \right\}$ converges to 1.



26. Prove that a region is polygonally connected.
27. Use the Cauchy – Riemann equations to verify that the polynomials $x^2 + y^2 - i2xy$ and $x^2 - y^2 + i2xy$ are analytic or not.
28. Show that $f'(z)$ doesn't exist at any non-zero point for the function $f(z) = |z|^2$.
29. Prove that if f is analytic in a region and if $|f|$ is constant there, then f is constant.
30. Prove that $\int_{-c}^c f = -\int_c^{-c} f$.
31. State and prove M-L formula.

PART – D

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

32. a) Show that $z_n \rightarrow z$ if and only if $\operatorname{Re} z_n \rightarrow \operatorname{Re} z$ and $\operatorname{Im} z_n \rightarrow \operatorname{Im} z$.
- b) Show that the sequence $\left\{ \frac{2n-1}{n} + i \frac{n+2}{n} \right\}$ converges to $2 + i$.
33. a) Suppose $f(z) = \sum_{n=0}^{\infty} C_n z^n$ converges for $|z| < R$. Prove that $f'(z)$ exists and equals $\sum_{n=0}^{\infty} n C_n z^{n-1}$ through out $|z| < R$.
- b) Prove that if $f(z) = \sum_{n=0}^{\infty} C_n z^n$ has a non-zero radius of convergence, then $C_n = \frac{f^{(n)}(0)}{n!}$ for all n .
34. a) Prove that if $f = u + iv$ is differentiable at z , then f_x and f_y exist there and satisfy the Cauchy – Riemann equation $f_y = if_x$.
- b) Show by an example that there are functions which are not differentiable at a point, despite the fact that the partial derivatives exist and satisfy the Cauchy – Riemann equations.
35. a) State and prove Integral Theorem.
- b) State and prove Closed Curve Theorem.
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme Under CBCSS
MATHEMATICS

Core Course

MM 1543 : Differential Equations
(2014 Admn. Onwards)

Max. Marks : 80

Time : 3 Hours

SECTION – I

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

1. Write down the standard form of Euler-Cauchy equation.
2. State the fundamental theorem for homogeneous linear differential equation.
3. Define Wronskian.
4. Write down the auxiliary equation of the differential equation $y'' + y' - 3y = 0$.
5. Verify that $y = \cos x$ is a solution of $y'' + y = 0$.
6. Find the order of the differential equation $x^2 y'' + 2y(y')^2 = 4$.
7. Find the integrating factor of $y' + y \tan x = \cos^3 x$.
8. Whether the differential equation $(1 + 4xy + 2y^2) dx + (1 + 4xy + 2x^2) dy = 0$ is exact ?
9. Define doubling time.
10. Define decay constant.

SECTION – II

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

11. Find a general solution of $y'' - 8y = 0$.
12. Find a real general solution of $x^2 y'' - 4xy' + 6y = 0$.
13. Find the Wronskian of the bases $\{1, e^x\}$.

P.T.O.

- 
14. Write down the auxiliary equation of the differential equation $x^2 y'' + x y' + 9y = 0$.
15. Find a general solution of $y'' - y = e^x + 6e^{2x}$.
16. Solve the differential equation $y' = \frac{3x^2 + 4x + 2}{2(y - 1)}$.
17. Solve the differential equation $(x^3 + 3xy^2) dx + (y^3 + 3x^2y) dy = 0$.
18. Solve the differential equation $y' - y = e^{2x}$.
19. If 100 grams of radioactive carbon - 14 are stored in a cave for 1000 years, how many grams will be left at that time?
20. Find a curve in the xy - plane that passes through $(0, 3)$ and whose tangent line at a point (x, y) has slope $\frac{2x}{y^2}$.
21. Define general solution of a non-homogeneous linear differential equation.
22. Solve the differential equation $x^2 y'' - \frac{5}{2} x y' - 2y = 0$.

SECTION - III

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

23. Solve the differential equation $(1 - x^2) y'' - 2x y' + 2y = 0$; $y_1 = x$ is a solution.
24. Solve the initial value problem $4y'' - 25y = 0$; $y(0) = 0$; $y'(0) = -5$.
25. Solve the boundary value problem $3y'' - 8y' - 3y = 0$; $y(-3) = 1$; $y(3) = \frac{1}{e^2}$.
26. Solve the initial value problem $x^2 y'' + 3x y' + y = 0$; $y(1) = 3$; $y'(1) = -4$.
27. Verify $y_p = x^3$ is a solution of $y'' - 2y' + 5y = 5x^3 - 6x^2 + 6x$ and find the general solution.
28. Solve the initial value problem $y' = -2xy$; $y(0) = 1$.
29. Solve the differential equation $(x^2 - 2x + 2y^2) dx + 2xy dy = 0$.
30. Solve the differential equation $y'' + 4y = 8x^2$.
31. Solve the initial value problem $xy' + 2y = 4x^2$; $y(1) = 2$.



SECTION - IV

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

32. Solve the initial value problem $y'' + 2y' + y = e^{-x}$; $y(0) = -1$; $y'(0) = 1$, using the method of undetermined coefficients.
33. Solve the following differential equations using the method of variation of parameters.
- a) $y'' + 9y = \operatorname{cosec} 3x$.
- b) $y'' + 2y' + 2y = 4e^{-x} \sec^3 x$.
34. a) Solve the differential equation $x(1 - x^2) y' + (2x^2 - 1)y = ax^3$.
- b) Use Euler's method with a step size of 0.1 to make a table of approximate values of the solution of the initial value problem $y' = y - x$; $y(0) = 2$, over the interval $0 \leq x \leq 1$.
35. At time $t = 0$, a tank contains 4 lb of salt dissolved in 100 gal of water. Suppose that brine containing 2 lb of salt per gallon of brine is allowed to enter the tank at a rate of 5 gal/min. and that the mixed solution is drained from the tank at the same rate. Find the amount of salt in the tank after 10 minutes.
-



Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
First Degree Programme under CBCSS
MATHEMATICS
Core Course – VII
MM 1544 : Vector Analysis
(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – 1

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

1. Find the gradient of $f(x, y, z) = \sin x + e^{xy} + z$.
2. Find the directional derivative of $f(x, y) = 3x^2y$ at the point $(1, 2)$ in the direction of the vector $a = 3i + 4j$.
3. Write Laplace's equation.
4. Define Curl of a vector function $F(x, y, z) = f(x, y, z)i + g(x, y, z)j + h(x, y, z)k$.
5. Show that $\int_C f(x, y) dx = 0$ along any line segment parallel to the y-axis.
6. Define the work by the vector field F on a particle that moves along a curve C .
7. Determine whether F is a conservative field
 $F(x, y) = (\cos y + y \cos x)i + (\sin x - x \sin y)j$.
8. Show that the line integral $\int_C y \sin x dx - \cos x dy$ is independent of the path.
9. State Green's theorem.
10. If $r = xi + yj + zk$ then prove that $\text{div } r = 3$.



SECTION - 2

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

11. Find a unit vector in the direction in which $f(x, y) = 4x^3y^2$ increases most rapidly at $P(-1, 1)$. Also find the rate of change of f at P in that direction.
12. What is a vector field ? Define potential function of a vector field.
13. Show that the field $F(x, y, z) = yz \mathbf{i} + xz \mathbf{j} + yx \mathbf{k}$ is a conservative field.
14. Evaluate the line integral $\int_C (x - y)dy - xdx$ where $C : x = \cos t, y = \sin t, 0 \leq t \leq 2\pi$.
15. Evaluate the integral $\int_C \mathbf{F} \cdot d\mathbf{r}$ along a curve C , where $F(x, y, z) = x^2 \mathbf{i} + xy \mathbf{j}$;
 $C : \mathbf{r}(t) = 2 \cos t \mathbf{i} + 2 \sin t \mathbf{j}, 0 \leq t \leq \pi$.
16. Using Green's theorem, evaluate $\int_C xy \, dy - y^2 dx$, where C is the square cut from the first quadrant by the lines $x = 1$ and $y = 1$.
17. If $\mathbf{r} = x \mathbf{i} + y \mathbf{j} + z \mathbf{k}$ show that $\text{curl } \mathbf{r} = 0$.
18. State Stokes' Theorem.
19. Find a parameterization of the cone $z = \sqrt{x^2 + y^2}, 0 \leq z \leq 1$.
20. State Divergence theorem.
21. Use the Divergence theorem to find the outward flux of the vector field $F(x, y, z) = zk$ across the sphere $x^2 + y^2 + z^2 = a^2$.
22. Find $\nabla \cdot (F \times G)$, where $F(x, y, z) = 2x \mathbf{i} + y \mathbf{j} + 4y \mathbf{k}$ and $G(x, y, z) = x \mathbf{i} + y \mathbf{j} - z \mathbf{k}$.

SECTION - 3

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

23. Find the work done by $F = z \mathbf{i} + x \mathbf{j} + y \mathbf{k}$ over the curve
 $\mathbf{r} = \sin t \mathbf{i} + \cos t \mathbf{j} + t \mathbf{k}, 0 \leq t \leq 2\pi$.



24. Find the divergence and the curl of the vector field $F = xyz \mathbf{i} + 3x^2y \mathbf{j} - (xz^2 - y^2z) \mathbf{k}$ at $(1, 2, -1)$.
25. Using Green's theorem, evaluate $\int_C x^2y \, dx + x \, dy$ along the triangular path obtained by joining the points $(0, 0)$, $(1, 0)$ and $(1, 2)$.
26. Using a line integral, find the area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.
27. Find the flux of the vector field $F(x, y, z) = zk$ across the sphere $x^2 + y^2 + z^2 = a^2$ oriented outward.
28. Find the flux of the field $F(x, y, z) = xi + yj + zk$ across the portion of the given surface σ , where σ is the portion of the surface $z = 1 - x^2 - y^2$, that lies above the xy -plane and is oriented up.
29. Using Divergence Theorem, find the outward flux of the vector field $F(x, y, z) = xyi + yzj + xzk$ across the unit cube.
30. Using Stokes' Theorem, find the work done by the vector field $F(x, y, z) = x^2i + 2xj + z^2k$, where C is the ellipse $4x^2 + y^2 = 4$ in the xy -plane, counter clockwise orientation looking down the positive z -axis.
31. Use Stokes' Theorem to evaluate $\int_C F \cdot dr$, if $F = xzi + xyj + 3xzk$ and C is the boundary of the portion of the plane $2x + y + z = 2$ in the first octant traversed counter clockwise as viewed from above.

SECTION – 4

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

2. i) The temperature at a point (x, y) on a metal plate in the xy -plane is

$$T(x, y) = \frac{xy}{1+x^2+y^2} \text{ degree.}$$

- a) Find the rate of change of temperature at $(1, 1)$ in the direction of $a = 2\mathbf{i} - \mathbf{j}$.
- b) An ant at $(1, 1)$ wants to walk in the direction in which the temperature drops most rapidly. Find a unit vector in that direction.



Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2017
First Degree Programme Under CBCSS
Stream : Finance
Elective Course – III : CO1561.1
INCOME TAX LAW AND PRACTICE – I
(2013 Adm.)

Time : 3 Hours

Max. Marks : 80

PART – A

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

1. How many heads of income are there to compute Gross Total Income ?
2. What is the previous year of a newly started business ?
3. What are the classes of an assessee on the basis of residence ?
4. What is the treatment of pension received by widow of an employee ?
5. What is Previous year ?
6. Which are the deductions from salary under Section 16 ?
7. What is the tax rate applicable on long term capital gain ?
8. What is the annual value of self occupied house property ?
9. How do you calculate indexed cost of improvement ?
10. Mr. Ashik, a non resident, earns an income of Rs. 1,00,000 in India. Is it taxable in India ?
(10×1=10 Marks)

PART – B

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

11. Differentiate between Gross Total Income and Total Income.
12. Who is a representative assessee ?
13. What is partly agricultural income ?

P.T.O.



14. How to find out residential status of a company ?
15. What are the different types of perquisites ?
16. What are different types of Provident Funds ?
17. What is standard deduction in connection with house property ?
18. Define the term 'Business'.
19. What is meant by 'Block of assets' ?
20. What is meant by transfer of capital asset ?
21. What is tax free commercial security ?
22. What is casual income ?

(8×2=16 Marks)

PART – C

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

23. Name the taxable entities classified for determining the residential status.
24. What are tax free perquisites ?
25. Distinguish between Long term and Short term capital gain.
26. What are the rules regarding charge of depreciation ?
27. Aravind retired from private service and is getting a monthly pension of Rs. 12,000 on 1-1-2015 he commuted one fourth of pension and received Rs. 1,50,000. Calculate taxable amount of pension for the Assessment Year 2015 – 16. He has not received gratuity at the time of retirement.
28. Mr. Ranish has two houses. First house is kept by him for his own residence and second house has been let out @ Rs. 5,000 p.m. Other particulars relating to these two houses are as follows.

	I house (Rs.)	II house (Rs.)
Municipal valuation	60,000	50,000
Fair rent	85,000	48,000
Standard rent	65,000	72,000
Municipal tax paid	10 %	10 %
Fire insurance premium	600	300
Interest on loan taken for reconstruction	56,000	Nil
Determine the house property income for the AY 2015 – 16.		



29. From the following information compute depreciation allowable for the Assessment Year 2015 – 16.

	Rs.
WDV of Machinery on 1-4-2014	3,40,000
Machinery purchased in December 2014	1,40,000
Machinery purchased in February 2015 but not installed	1,25,000
Part of Machinery sold in January 2015	1,30,000
Rate of depreciation	15 %

30. Mr. Chandrashekhar purchased a house property for Rs. 1,75,000 in 1981 – 82 and paid Rs. 10,000 as registration expense. He sold this house in June 2014 for Rs. 24,00,000. He incurred Rs. 10,000 as brokerage on sale. The market value of this house on 2000 – 01 was Rs. 10,00,000. Compute his capital gain chargeable for the Assessment Year 2015 – 16.
(CII 2014 – 15 1024, 2000 – 01 406, 1981 – 82 100)

31. The following income was received by Mr. Aneesh during the year 2014 – 15.

Directors fee	Rs. 6,000
Income from agricultural land in Sri Lanka	Rs. 50,000
Interest from Post Office Savings Account	Rs. 2,000
Dividend from co-operative society	Rs. 4,000
Royalty on Books from the Publisher	Rs. 20,000

He has incurred the following expenses

1. Collection charges Rs. 100 for dividend
2. Rs. 500 towards stationery, typing etc. on books published.

Compute income from other source.

(6×4=24 Marks)

PART – D

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

32. What is annual value ? Explain the method of determining annual value for different kinds of house property.
33. Discuss the incidence of tax liability.



34. Mr. Subair is employed in a private firm in Kochi. He gets Rs. 10,000 p.m. as Basic salary, Rs. 5,000 p.m. as DA and Rs. 500 p.m. as medical allowance. He has been provided with a furnished accommodation of the estimated rental value of Rs. 3,000 p.m. Furniture costing Rs. 15,000 has also been provided. The house is also provided with a gardener on a monthly salary of Rs. 500. He has been given a small car which is used by him for personal purpose also. All expenses of car are borne by the employer. He and his employer contribute 15 % of pay and DA to the Recognised Provident Fund. He had taken interest free loan of Rs. 15,000 to purchase Mobile phone. Determine his salary income for the AY 2015 – 16.
35. From the following information for the year 2014 – 15 ascertain the taxable profit from the business.

Income Statement

To Office salaries	80,000	By Gross profit	2,75,550
To Proprietors salary	36,000	By Dividend	3,800
To Interest on capital	12,500	By Profit on sale of fixed asset	2,000
To Interest on loan	9,000	By Interest from Govt. Security	5,200
To General expenses	3,400	By Bad debts recovered	8,000
To Sales Tax	4,000	By Sundry receipts	750
To Bad debt	2,700		
To Telephone expenses	4,250		
To Advertisement	25,000		
To Depreciation	19,500		
To Donation	2,000		
To Advance Income Tax	5,000		
To Fire Insurance Premium	2,400		
To Provision for doubtful debt	2,000		
To Provision for future losses	5,000		
To Net Profit	82,550		
	2,95,300		2,95,300

Additional Information :

- Donation include Rs. 1,000 towards Chief Minister's Relief Fund.
- Advertisement was paid in cash.
- Depreciation charged is in excess by Rs. 3,000
- Bad debts recovered were earlier disallowed.
- General expenses include Rs. 200 by way of help to a poor student.
- Provision for future losses is meant for disputed tax liability. **(2×15=30 Marks)**



Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2017

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** word to maximum of **two** sentences. **Each** question carries **one** mark.

1. Who is a deemed assessee ?
2. Define Assessment year.
3. Give an example of fully exempted allowance.
4. What is URPF ?
5. What is gross annual value ?
6. What is capital asset ?
7. What is a tax free commercial security ?
8. Write any one exempted income.
9. State the rate of deduction of tax at source from winning from lottery.
10. What is casual income ?

(10×1=10 Marks)



SECTION – B

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

11. Explain the term annual value.
12. What are tax free perquisites ?
13. What do you mean by indexation ?
14. What is the relationship between Income Tax Act and Finance Act ?
15. Who is a specified employee ?
16. Explain CBDT.
17. Define House Property Income.
18. Mr. Higgins a foreign cricketer comes to India for 100 days every year since the financial year 2005-2006. Find out his residential status for the assessment year 2016-17.
19. Mr. 'Suresh' retired as the General Manager of a Sugar Mill on 1-4-2015. His pension was fixed by the employer at the rate of ₹ 1,000 per month. He commuted $\frac{3}{4}$ of the pension and received ₹ 36,000 as the value of the commuted pension on 31-12-2015. Compute his gross income from salary for the assessment year 2016-17.
20. Sri. V. Ghosh (private employee) gets a salary of ₹ 2,000 p.m. and he is provided with rent free furnished accommodation whose fair rental value is ₹ 1,300 p.m. Calculate the value of rent free accommodation if the cost of furniture provided is ₹ 10,000 (population of more than 25 lakhs).
21. Calculate Annual Rental Value from the following particulars for the assessment year 2016-17. Actual rent ₹ 14,000 p.m; MRV ₹ 1,20,000 p.a; FRV ₹ 1,32,000 p.a. Standard rent ₹ 1,38,000. During the previous year the assessee is not able to realize two months rent.
22. Mr. Tom is now working at Cochin on a salary of ₹ 6,000 p.m. The employer allows him an HRA of ₹ 600 p.m. However the actual rent paid by the employee is ₹ 800 p.m. Calculate his gross salary.

(8×2=16 Marks)



SECTION – C

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

23. There are certain exceptions to rule related with previous year. Explain.
24. Write any five exempted incomes.
25. Write the important rules related with gratuity in income tax.
26. What is bond washing transaction ?
27. What is aggregation of Income ?
28. What are the capital gains which are exempt from tax ?
29. The following are the details of income of Mr. Bimal Basu :
- a) Income of ₹ 2,000 accrued in Canada but received in India.
 - b) ₹ 5,000 earned in India but received in Canada.
 - c) House property income (Computed) from Srilanka ₹ 2,000.
 - d) ₹ 5,000 were earned in Africa and received there.
- Compute the total income of "Bimal Basu" if he is (i) Resident and (ii) Non resident.
30. Mr. Mahesh, after having a continuous service of 30 years and 7 months in a private company retired from service on 15th December 2015. He received ₹ 2,50,000 as gratuity from his employer. During the last 10 months he was drawing a monthly basic pay of ₹ 12,000 and DA ₹ 3,500 and HRA ₹ 750. You are required to calculate the amount of gratuity exempt from tax if, his company is covered under the payment of Gratuity Act.
31. Compute the income from house property from the following information.
Municipal value of the house ₹ 18,000 p.a. Fair rental value of the house ₹ 17,500.
Actual rent ₹ 2,000 p.m, Municipal taxes ₹ 3,000 p.a. Construction of the house was completed on 1-4-2015. The house was let out for the period 1st April 2015 to 31 December 2015. It was self-occupied from 1-1-2016 onwards. Fire insurance premium ₹ 1,800, Land revenue ₹ 3,000.
Interest on loan for the period : i) 1-4-2012 to 31-3-2015 ₹ 22,500
ii) 1-4-2015 to 31-3-2016 ₹ 7,500.

(6×4=24 Marks)



SECTION – D

Answer any 2 questions not exceeding four pages. Each question carries 15 marks.

32. Mr. Jacob is now working in a private company at Calicut. From the following particulars, calculate his Income from salary for the assessment year 2016-17.

- 1) Salary ₹ 10,000 p.m.
- 2) DA @ 10% of salary.
- 3) A car with an engine capacity of 1.5 litres (small car) is provided by employer. All expenses relating to the car including driver's salary is met by the employer. The car is used for both personal and official purpose.
- 4) He is also getting an amount of ₹ 2,000 p.m. as House Rent Allowance and he pays rent of ₹1,500 p.m.
- 5) He paid ₹1,200 as professional tax for the last financial year.
- 6) City compensatory allowance @ ₹ 700 p.m.
- 7) He is contributing ₹1,500 p.m. towards recognized provident fund. The employer is also contributing the same amount.

33. What are the incomes chargeable under the head income from other sources ?

34. "B" owns a house property at Delhi. It was completed on 1-11-2013 and is used as follows.

- a) 25% of floor is used for his own business.
- b) 25% of the floor area is self-occupied.
- c) 25% of the floor area is let out for residential purpose at ₹ 1,000 p.m.
- d) 25% of the floor area was let out for non-residential purposes at ₹1,000 p.m. with effect from 1-4-15 to 28-2-16 and self occupied from 1-03-16 onwards. Municipal taxes paid ₹ 4,000 p.a.

Compute B's Income from House property.

35. What are perquisites ? Explain the provisions of Income tax related with different types of perquisites ?

(2×15=30 Marks)



(Pages : 2)

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Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2017

First Degree Programme under CBCSS

Stream : Finance

Elective Course III : CO 1561.1

FINANCIAL MARKETS AND SERVICES

(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What do you mean by financial system ?
2. What do you mean by reverse mortgage ?
3. What do you mean by financial lease ?
4. What do you mean by commercial paper ?
5. What do you mean by deep discount bond ?
6. What do you mean by money back policy ?
7. What are floating rate housing loans ?
8. Expand CRISIL.
9. What is forfeiting ?
10. Define credit rating.

(10×1=10 Marks)

SECTION – B

Answer **any eight** questions, **each** in a short paragraph **not** exceeding **50** words.

11. What are the important functions of financial system ?
12. Mention the promotional assistance given by IDBI.
13. Give a short note on market for financial guarantees.
14. Write the importance of financial service.

P.T.O.

D – 2644



15. What are the different types of venture capital ?
16. What are the limitations of leasing ?
17. What do you mean by merchant banking ?
18. What are the various types of fire insurance policies ?
19. What is the importance of housing finance ?
20. What are the features of hire purchase system ?
21. What do you mean by securitization of debt ?
22. What do you mean by infrastructure financing ?

(8×2=16 Marks)

SECTION – C

Answer **any six** questions, **each** in a paragraph **not** exceeding **120** words.

23. Explain briefly the classification of equity shares.
24. Explain the features of capital market.
25. What are the characteristics of foreign exchange market ?
26. Give a note on the various fund based financial services.
27. Briefly explain the features of venture capital.
28. Differentiate between operating lease and financial lease.
29. Explain the different types of marine insurance.
30. Explain the various credit rating factors.
31. What are the merits and demerits of mutual fund investment ?

(6×4=24 Marks)

SECTION – D

Answer **any two** questions, **not** exceeding **four** pages.

32. What do you mean by money market ? Explain the different types of money market instruments.
33. What do you mean by factoring ? Explain the different types of factoring.
34. Explain the procedure for granting housing loan.
35. Explain the different stages of portfolio management.

(2×15=30 Marks)



(Pages : 3)

D – 2647

Reg. No. :

Name :

Fifth Semester B.Com. Degree Examination, December 2017

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 in **one** word to maximum of **two** sentences. **Each** question carries **one** mark.

1. What is secondary market ?
2. Name two methods of public issue.
3. What are gilt edged securities ?
4. Expand NSE.
5. What is IPO ?
6. What is private placement ?
7. What is call option ?
8. What is meant by dematerialization of scrips ?
9. What is book building ?
10. What is listing of securities ?

(10×1 = 10 Marks)

P.T.O.



SECTION - B

Answer **8** questions in **one** paragraph. **Each** question carries **2** marks.

11. Write and explain about two types of preference shares.
12. What are the important types of debentures ?
13. What are the securities traded in stock exchanges ?
14. What are the different types of options ?
15. What are the features of forwards ?
16. What are the benefits of depository system ?
17. Write a short note on BSE.
18. What is a bonus share ?
19. What is speculation ?
20. What are the main features of equity shares ?
21. What is meant by listing of shares ?
22. What is delisting ?

(8×2 = 16 Marks)

SECTION - C

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

23. Write the main features of a stock exchange.
24. What are the differences between primary market and stock exchange ?
25. What are the merits of online trading ?
26. What are the provisions related to issue of nonvoting shares ?
27. What is demutualization of stock exchanges ?



28. Who borrows funds from capital market ?
29. What are the objectives of the inter-connected stock exchange of India ?
30. What are the different types of speculators ?
31. What is rematerialisation ? Explain the process of rematerialisation.

(6×4 = 24 Marks)

SECTION - D

Answer **any 2** questions **not** to exceeding **four** pages. **Each** question carries **15** marks.

32. What is a capital market ? Explain the scope, functions and importance of capital market.
33. What is dematerialization ? Explain the procedures for dematerialization.
34. Briefly explain the methods of trading in stock exchanges.
35. What is primary market ? What are the methods of floating capital in primary market ?

(15×2 = 30 Marks)



Reg. No. :

Name :

**Fifth Semester B.A. (Malayalam and Mass Communication) Degree
Examination, December 2017
(Career Related First Degree Programme Under CBCSS)
Group 2(a)
Core Course – VIII
MX 1542 : KERALA SAMSKARAM (Bhagam – II)
(2013 Admn.)**

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ ഒന്നോ രണ്ടോ വാചകങ്ങളിലോ എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരമെഴുതുക.

- 1) ഇന്ത്യയിൽ യൂറോപ്യന്മാർ നിർമ്മിച്ച ആദ്യത്തെ കോട്ട ഏത് ?
- 2) കേരളചരിത്രത്തിൽ 1641-ന്റെ പ്രാധാന്യമെന്ത് ?
- 3) ഹോർത്തൂസ് മലബാറിക്കസിന്റെ മറ്റൊരു പേര് ?
- 4) ജാതിവ്യവസ്ഥയെ ഖണ്ഡിക്കാൻ അശ്വഘോഷന്റെ ഒരു കൃതി 'വജ്രസൂചി' എന്ന പേരിൽ വിവർത്തനം ചെയ്ത മിഷണറി പ്രവർത്തകൻ ?
- 5) എസ്. എൻ. ഡി. പി. യുടെ സ്ഥാപക നേതാവ് ?
- 6) 'അൽ ഇസ്ലാം' എന്ന അറബിമലയാളം മാസികയുടെ പത്രാധിപർ ആരായിരുന്നു ?
- 7) എൻ. എസ്. എസിന്റെ മുഖ പത്രം ?
- 8) കൊച്ചി സാങ്കേതിക സർവ്വകലാശാലയുടെ ആദ്യത്തെ വൈസ് ചാൻസിലർ ?
- 9) സംസ്ഥാന വിദ്യാഭ്യാസ വകുപ്പിന്റെ ആഭിമുഖ്യത്തിലുള്ള സമ്പൂർണ്ണ വിദ്യാഭ്യാസ ചാനൽ ഏത് ?
- 10) കേരള കലാമണ്ഡലം കല്പിത സർവ്വകലാശാലയുടെ ആസ്ഥാനം. (10×1=10മാർക്ക്)

P.T.O.



II. ഒരു ഖണ്ഡികയിൽ കവിയാതെ ഏതെങ്കിലും എട്ടു ചോദ്യങ്ങൾക്കുത്തരമെഴുതുക.

- 11) ഉദയംപേരൂർ സൂനഹദോസിന്റെ പ്രധാന ലക്ഷ്യങ്ങൾ എന്തെല്ലാമായിരുന്നു ?
- 12) കേരളവുമായുള്ള പോർട്ടുഗീസ് ബന്ധത്തിന്റെ പ്രധാനപ്പെട്ട രാഷ്ട്രീയ ഫലങ്ങൾ ഏവ ?
- 13) എൽ. എം. എസ്, സി. എം. എസ്, ബി. എം. എസ് ഇവ എന്തെന്ന് വ്യക്തമാക്കുക.
- 14) മലയാളിമെമ്മോറിയലിന്റെ ചരിത്രപ്രാധാന്യം വ്യക്തമാക്കുക.
- 15) പൗരസമത്വ പ്രക്ഷോഭത്തെക്കുറിച്ച് കുറിപ്പെഴുതുക.
- 16) കേരളത്തിലെ നവോത്ഥാന സാമൂഹിക സംഘടനകളുടെ പൊതുസ്വഭാവം എന്തായിരുന്നു ?
- 17) കേരള സമൂഹത്തിലെ നവോത്ഥാന ചിന്തകളെ ചട്ടമ്പിസ്വാമിയുടെ പ്രവർത്തനങ്ങൾ എപ്രകാരമാണ് സ്വാധീനിച്ചത് ?
- 18) 'പ്രജാമണ്ഡല'ത്തിന് കേരളചരിത്രത്തിലുള്ള പ്രാധാന്യമെന്ത് ?
- 19) കുളച്ചൽ യുദ്ധത്തിന്റെ ചരിത്ര പ്രാധാന്യം വ്യക്തമാക്കുക.
- 20) സാമൂഹ്യമാദ്ധ്യമങ്ങൾ എന്തെന്ന് ഉദാഹരണസഹിതം വ്യക്തമാക്കുക.
- 21) കേരളത്തിലെ പ്രധാന അനുഷ്ഠാനകലകൾ ഏതെല്ലാം ?
- 22) കേരളത്തിലെ കായിക വിനോദങ്ങളെപ്പറ്റി കുറിപ്പെഴുതുക. (8×2=16മാർക്ക്)

III. നൂറ്റിയിരുപതു വാക്കിൽ കവിയാതെ ഏതെങ്കിലും ആറ് ചോദ്യങ്ങൾക്കുത്തരമെഴുതുക.

- 23) പോർട്ടുഗീസുകാർക്ക് കേരളത്തിൽ കാര്യമായ സ്വാധീനം ചെലുത്താൻ കഴിയാതെ പോയത് എന്തുകൊണ്ട് ?
- 24) ഡച്ചുകാർ കൊച്ചി പിടിച്ചടക്കാനുണ്ടായ സാഹചര്യം വിശദമാക്കുക.
- 25) സാധുജന പരിപാലന സംഘത്തിന്റെ പ്രവർത്തന ചരിത്രം സംഗ്രഹിക്കുക.



- 26) കേരളസംസ്ഥാനത്ത് ജന്മി-കുടിയാൻ ബന്ധങ്ങൾ അവസാനിപ്പിക്കാൻ ഭൂപരിഷ്ക്കരണ നിയമം കൊണ്ട് സാധിച്ചുവോ ? സ്വമതം നിരൂപിക്കുക.
- 27) ബ്രിട്ടീഷ് ആധിപത്യം വിദ്യാഭ്യാസ പുരോഗതിക്ക് നൽകിയ സംഭാവനകൾ ചർച്ച ചെയ്യുക.
- 28) ക്ഷേത്രകലകൾ എന്ന നിലയിൽ കൂത്ത്, കുടിയാട്ടം എന്നിവയെ പരിചയപ്പെടുത്തുക.
- 29) കേരളീയ സമൂഹത്തിൽ നവമാധ്യമങ്ങൾ ചെലുത്തുന്ന സ്വാധീനം എപ്രകാരമെന്ന് സോദാഹരണം വ്യക്തമാക്കുക.
- 30) വേലുത്തമ്പി ദളവായുടെ രാജ്യസ്നേഹത്തെക്കുറിച്ച് വിവരിക്കുക.
- 31) ഐക്യകേരള പ്രസ്ഥാനത്തിന്റെ ചരിത്രം വിശദമാക്കുക. (6×4=24 മാർക്ക്)

IV. ഏതെങ്കിലും രണ്ടു ചോദ്യങ്ങൾക്ക് ഉപന്യാസ മാതൃകയിൽ ഉത്തരമെഴുതുക.

- 32) ഡച്ചുകാരുടെ ഉയർച്ചയ്ക്കും അധഃപതനത്തിനും ഇടവരുത്തിയ സാഹചര്യങ്ങൾ എന്തെല്ലാമായിരുന്നു ?
- 33) പരാജയപ്പെട്ട ഒരു കലാപമായി പഴശ്ശിവിപ്ലവത്തെ കരുതാമോ ? എന്തുകൊണ്ട് ?
- 34) നവോത്ഥാന കാലഘട്ടത്തിൽ കേരളം കണ്ട സാമൂഹ്യപരിഷ്ക്കർത്താക്കളെ പരിചയപ്പെടുത്തുക.
- 35) ബ്രിട്ടീഷുകാർക്കെതിരായി കേരളത്തിൽ നടന്ന ആദ്യകാല സമരങ്ങളുടെ ചരിത്രം സംഗ്രഹിക്കുക. (2×15=30 മാർക്ക്)
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(Pages : 2)

D – 2666

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Group 2(a)

MALAYALAM AND MASS COMMUNICATION
Vocational Course – VII
MX 1571 : Radio Programme Production
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

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

1. Lionel Fielden.
2. Uni-directional mike.
3. DJ.
4. Radio Mirchi.
5. Actuality.
6. Jingle.
7. OB.
8. Amplitude.
9. Audio console.
10. Music bed.

(10×1=10 Marks)

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

11. PSA.
12. Field log sheet.
13. Voxpop.
14. Visual radio.
15. Community radio.

P.T.O.

D – 2666



16. Frequency.

17. Cue.

18. Vividh Bharati.

19. Radio Mango.

20. Dubbing.

21. DAB.

22. Radio commentary.

(8×2=16 Marks)

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

23. Briefly explain the different radio formats.

24. Differentiate between AM and FM stations.

25. What is radio jockeying ?

26. What are the software used in radio programme production ?

27. "Music is the soul of radio". Comment.

28. Delineate the characteristics of Internet radio.

29. Enlist the important international radio networks.

30. What are the headphones used in a radio production studio ?

31. Narrate the role and contributions of radio clubs during the early years of broadcasting in India.

(6×4=24 Marks)

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

32. Explain the role and characteristics of radio as a medium of mass communication.

33. Prepare a 5-minute radio news script based on news items of your choice.

34. Elucidate the layout and equipment in a radio production studio.

35. Radio drama has been described as 'the theatre of the mind'. Explain. (2×15=30 Marks)



(Pages : 3)

D – 2667

Reg. No. :

Name :

**Fifth Semester B.A. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Group 2 (a)**

**Malayalam and Mass Communication
Vocational Course VIII**

**MX 1572 : INTRODUCTION TO TELEVISION PRODUCTION
(2013 Admission)**

Time : 3 Hours

Max. Marks : 80

I. Answer **all** the questions in **two** or **three** sentences.

- 1) Fade in
- 2) Match cut
- 3) Tire cine
- 4) Voice over
- 5) Back right
- 6) Linear editing
- 7) Montage
- 8) Lip sync
- 9) Key frames
- 10) Filter.

(10×1= 10 Marks)

P.T.O.



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

- 11) Public Service Broad Casting.
- 12) Logging
- 13) Crabbing
- 14) Underlighting
- 15) Colour temperature
- 16) Highlight
- 17) French Angle
- 18) Attached shadows
- 19) Synchronous sound
- 20) Soft lighting
- 21) Lavalier microphones
- 22) White balance.

(8×2=16 Marks)

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

- 23) How do you define mise-en-scene ?
- 24) What is 180 degree rule ?
- 25) List the advantages of non-linear editing.
- 26) What are elements in maintaining sound continuity ?
- 27) Explain visual language.
- 28) Lighting shapes a shot's overall composition. Elaborate.



29) Sound enhances a sense of realism, even suggesting quite subtle aspects of theme. Describe.

30) Three point lighting is mostly suited for high-key lighting. Explain.

31) Define composition.

(6×4=24 Marks)

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

32) What are the different categories of transparency keys available to a video editor ? Also mention how they help while superimposing clips.

33) Describe the various stages of producing a T.V. programme.

34) What are the physical needs for fragmenting scenes into shots ? Also list the various types of shots.

35) Differentiate between simple editing parallel editing and montage editing.

(2×15=30 Marks)



(Pages : 3)

D – 2686

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
Career Related First Degree Programme Under CBCSS
Group 2(a) : MALAYALAM AND MASS COMMUNICATION
Core Course – VII
MX 1541 : Nadodi Vijnaneeyam
(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

- I. ഒറ്റ വാക്കിലോ പരമാവധി രണ്ടു വാക്യത്തിലോ എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരമെഴുതുക.
- 1) ഫോക്ലോറിന് പകരം ഫോക്ലൈഫ് എന്ന് ഉപയോഗിച്ചു പണ്ഡിതൻ ആരാണ് ?
 - 2) എന്താണ് അവചപുരാവൃത്തം ?
 - 3) 'ഫോക്ലോർ ദിനം' ആചരിക്കുന്നതെന്ന് ?
 - 4) ലോർ എന്ന പദം അർത്ഥമാക്കുന്നത് എന്താണ് ?
 - 5) 'അഡഗിയ മലബാറിക്ക'യുടെ കർത്താവാരാണ് ?
 - 6) കെട്ടുമുറസിദ്ധാന്തത്തിന്റെ ആവിഷ്കർത്താക്കൾ ആരെല്ലാമാണ് ?
 - 7) കാക്കാനും കാക്കാത്തിമാരും പ്രത്യക്ഷപ്പെടുന്ന നാടോടിനാടകം ഏതാണ് ?
 - 8) നാടോടിപ്പാട്ടുകളുടെ സമാഹാരമായ, ഫിന്നിഷ്സാഹിത്യത്തിലെ ക്ലാസിക്സ് ആണ് ?
 - 9) കൂടവും വീണയും ഉപയോഗിച്ച് നാഗങ്ങളെ വാഴ്ത്തിപ്പാടുന്ന പാട്ട് ഏതാണ് ?
 - 10) ഏതു പാട്ടുകളെയാണ് 'ചാരൻപാട്ടുകൾ' എന്നു വിളിക്കുന്നത് ? (10x1=10മാർക്ക്)

P.T.O.



II. ഒരു ഖണ്ഡികയിൽ കവിയാതെ എട്ടു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 11) 'ഫോക്ലോറിസം' എന്നെന്നു വിശദമാക്കുക.
- 12) കേരളത്തിലെ നാടോടി വിശ്വാസങ്ങളിൽ പക്ഷിമൃഗാദികളുടെ ശബ്ദങ്ങളുടെ അർത്ഥം എങ്ങനെയൊക്കെയാണ് വ്യാഖ്യാനിച്ചിരുന്നത് ?
- 13) പുരാവൃത്തത്തിന്റെ സവിശേഷതകൾ ക്രോഡീകരിക്കുക.
- 14) പാചകവിദ്യയുടെ വസ്തുഭേദം എന്നതുകൊണ്ട് ഉദ്ദേശിക്കുന്നതെന്ത് ?
- 15) 'സോപാനസംഗീതം' കേരളത്തിന്റെ തനതായശൈലിയാകുന്നതെങ്ങനെ ?
- 16) കഥ ഐതിഹ്യമായിത്തീരുന്നതെങ്ങനെ ?
- 17) അലൻഡെന്റിസ് ഫോകിനെ നിർവ്വചിക്കുന്നതെങ്ങനെ ?
- 18) എന്താണ് ഇക്കോലോർ ?
- 19) ഫോക്ലോർമ്യൂസിയത്തിന്റെ പ്രാധാന്യം എന്ത് ?
- 20) "കുറഞ്ഞൊരു വഴിയും നടക്കുന്നുണ്ടേ
വളർമാവും കൊമ്പൊന്നടർന്നു വീണെ" - സന്ദർഭം വിവരിക്കുക.
- 21) മുടിയേറ്റിലെ ഐതിഹ്യം ചുരുക്കി വിവരിക്കുക.
- 22) യഥാസ്ഥിതിക രംഗവേദികളിൽ (Orthodox theatre) പ്രതീകാത്മക സമയം (Symbolic time) സ്വീകരിക്കുന്നതിന്റെ ഔചിത്യമെന്ത് ?

(8×2=16 മാർക്ക്)

III. ഒരു പുറത്തിൽ കവിയാതെ ഏതെങ്കിലും ആറു ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) ഭക്ഷണകാര്യത്തിലെ സ്ട്രീപുരുഷഭേദം എപ്രകാരമാണ് ?
- 24) കഥയുടെ സ്വഭാവത്തെ മുൻനിർത്തി ഐതിഹ്യങ്ങളെ എങ്ങനെയൊക്കെ വർഗ്ഗീകരിക്കാം ?
- 25) നാടോടിസംഗീതവും ജനകീയസംഗീതവും വ്യത്യാസപ്പെട്ടിരിക്കുന്നതെങ്ങനെ ?
- 26) ഫോക്ലോർ നിർവ്വചനങ്ങളെ അപഗ്രഥിക്കുക.
- 27) ആരോമൽ ചേകവർ അങ്കത്തിനു പുറപ്പെടുമ്പോൾ ഉണ്ടാകുന്ന ശകുനപ്പിഴകൾ എന്തൊക്കെയാണിവ ?



- 28) 'ഫോക്ലോർ അതത് കൂട്ടായ്മകളെ വിദ്യാഭ്യാസം ചെയ്യിക്കുന്നു' എന്നു പറയുന്നതിലെ സാംഗത്യം പരിശോധിക്കുക.
- 29) നാഗരികഫോക്ലോർ പഠനം പ്രസക്തമാകുന്നത് എങ്ങനെ ?
- 30) ഏതെങ്കിലുമൊരു പ്രാദേശികനാടോടി വിജ്ഞാനീയത്തെ പരിചയപ്പെടുത്തുക.
- 31) പ്രകടനവും സംസ്കാരവും തമ്മിൽ ബന്ധപ്പെടുന്നതെങ്ങനെ എന്ന് വിലയിരുത്തുക. (6×4=24 മാർക്ക്)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ ഏതെങ്കിലും രണ്ട് ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 32) ഫോക്ലോർ ഒരു കൂട്ടായ്മയിൽ നിർവ്വഹിക്കുന്ന ധർമ്മങ്ങൾ എന്തൊക്കെയാണ് ? വിശദമാക്കുക.
- 33) വിവിധ ജനസമൂഹങ്ങളുടെ പാചകവിദ്യയെക്കുറിച്ചുള്ള അന്വേഷണം ജനസംസ്കാര പഠനങ്ങളിൽ പ്രസക്തമാകുന്നത് എങ്ങനെ ?
- 34) നാടൻപാട്ടുകളിൽ വടക്കൻപാട്ടുകൾക്കുള്ള സ്ഥാനം നിർണ്ണയിക്കുക.
- 35) വ്യവസ്ഥാപിതവും പൗരാണികവുമായ അവതരണ പാരമ്പര്യത്തിന്റെ സവിശേഷതകൾ വിവരിക്കുക. (2×15=30 മാർക്ക്)



(Pages : 3)

D – 2687

Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
Career Related First Degree Programme Under CBCSS
Group 2(a) : MALAYALAM AND MASS COMMUNICATION
Core Course – VIII
MX 1542 : Keralasamskaram Bhagam – II
(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ പരമാവധി രണ്ട് വാക്യത്തിലോ ഉത്തരമെഴുതുക.

- 1) സാമൂതിരിയുടെ വലംകൈയായി വർത്തിച്ച നാവിക സൈന്യാധിപൻ ആരായിരുന്നു ?
- 2) മാർത്താണ്ഡവർമ തിരുവിതാംകൂറിന്റെ രാജാവായി അധികാരം ഏറ്റെടുത്ത വർഷം ഏത് ?
- 3) നാട് നാട്ടുകാർ ഭരിക്കണമെന്ന ആശയം ആദ്യമായി പ്രഖ്യാപിച്ച ധീരദേശാഭിമാനിയാര് ?
- 4) തിരുവനന്തപുരത്ത് ആദ്യത്തെ ഇംഗ്ലീഷ് വിദ്യാലയം സ്ഥാപിതമായത് ആരുടെ ഭരണകാലത്താണ് ?
- 5) പി. ഗോവിന്ദപിള്ളയുടെ പത്രാധിപത്യത്തിൽ പ്രസിദ്ധീകരണം ആരംഭിച്ച സാഹിത്യമാസിക ഏത് ?
- 6) വേദാധികാര നിരൂപണം ആരുടെ കൃതിയാണ് ?
- 7) ക്ഷേത്രപ്രവേശന വിളംബരം പുറപ്പെടുവിച്ചത് എന്ന് ?
- 8) അടക്കളയിൽ നിന്ന് അരങ്ങത്തേയ്ക്ക് ആരുടെ കൃതിയാണ് ?
- 9) സാധുജന പരിപാലന യോഗം രൂപീകരിച്ചത് ആര് ?
- 10) കേരളത്തെ സമ്പൂർണ്ണ സാക്ഷരതാ സംസ്ഥാനമായി പ്രഖ്യാപിച്ചതെന്ന് ?

(10×1=10 Marks)

P.T.O.



II. അരപ്പുറത്തിൽ കവിയാതെ 8 ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 11) എഴുത്തച്ഛൻ.
- 12) കുഞ്ഞാലി മരയ്ക്കാർ.
- 13) പഴശ്ശിവിപ്ലവം.
- 14) സമസ്ത കേരളസാഹിത്യ പരിഷത്ത്.
- 15) ബഞ്ചമിൻ ബയ്ലി.
- 16) കവിസമാജം.
- 17) ചാന്നാർ ലഹള.
- 18) മലയാളി മെമ്മോറിയൽ.
- 19) കൂത്ത്.
- 20) തെയ്യം.
- 21) ഉദയം പേരൂർ സുനഹദോസ്.
- 22) ഇന്റർനെറ്റും വിവരങ്ങളുടെ പ്രവാഹവും.

(8x2=16 Marks)

III. ഒരു പുറത്തിൽ കവിയാതെ ആറ് ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) പത്രമാസികകളുടെ ആവിർഭാവത്തിന് അച്ചടിവിദ്യ വഹിച്ച പങ്ക് വിലയിരുത്തുക.
- 24) കേരളത്തിലെ പോർട്ടുഗീസ് ശക്തിയുടെ തകർച്ചയ്ക്ക് ആക്കം കൂട്ടിയതിൽ മുഖ്യപങ്ക് വഹിച്ചവരാണ് കുഞ്ഞാലി മരയ്ക്കാർമാർ - വിശദീകരിക്കുക.
- 25) ആറ്റിങ്ങൽ കലാപം.
- 26) നവോത്ഥാന കാലത്തെ മുഖ്യസംഭവങ്ങളിലൊന്നാണ് പുരോഗമന സാഹിത്യ പ്രസ്ഥാനം - വിലയിരുത്തുക.
- 27) പാലിയം സമരം സ്വതന്ത്രഭാരതത്തിൽ, വഴി നടപ്പവകാശത്തിനുവേണ്ടി നടത്തേണ്ടി വന്ന സമരമാണ്. വിശദീകരിക്കുക.
- 28) സഹോദര പ്രസ്ഥാനം.



29) വേലുത്തമ്പിയും പാലിയത്തച്ഛനും നടത്തിയ സമരത്തെക്കുറിച്ച് വിശദീകരിക്കുക.

30) കേരളത്തിന്റെ സാംസ്കാരിക മുന്നേറ്റത്തിൽ ഭൂപരിഷ്കരണനിയമങ്ങൾ സ്വാധീനം ചെലുത്തിയിട്ടുണ്ടോ ?

31) പ്രവാസികൾ കേരളത്തിന്റെ സാമൂഹിക മുന്നേറ്റത്തിൽ വഹിച്ച പങ്ക് വിലയിരുത്തുക.

(6×4=24 Marks)

IV. മൂന്നു പുറത്തിൽ കവിയാതെ 2 ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

32) പോർട്ടുഗീസ് ബന്ധത്തിന്റെ ഫലമായി കേരളത്തിനുണ്ടായ സുപ്രധാന നേട്ടങ്ങൾ വിലയിരുത്തുക.

33) നവമാധ്യമങ്ങൾ മാധ്യമസംസ്കാരത്തിന്റെ രൂപത്തെയും ഘടനയെയും തന്നെ മാറ്റിമറിച്ചിരിക്കുന്നു. അഭിപ്രായം സ്രവ്യപിക്കുക.

34) ആധുനിക വിദ്യാഭ്യാസത്തിന് വിദേശമിഷണറിമാർ നൽകിയ സംഭാവനകൾ ചുരുക്കി പ്രതിപാദിക്കുക.

35) ആധുനിക തിരുവിതാംകൂറിന്റെ രൂപീകരണത്തിൽ മാർത്താണ്ഡവർമ്മ വഹിച്ച പങ്ക് വിശകലനം ചെയ്യുക.

(2×15=30 Marks)



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Reg. No. :

Name :

Fifth Semester B.A. Degree Examination, December 2017
Career Related First Degree Programme Under CBCSS
Group 2(a) : MALAYALAM AND MASS COMMUNICATION
Core Course – IX
MX 1543 – Natakam : Charithram, Padam, Prayogam
(2014 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ പരമാവധി രണ്ട് വാക്യത്തിലോ ഉത്തരം എഴുതുക.

- 1) 'കോമഡി ഓഫ് എറേഴ്സ്' എന്ന നാടകത്തിന് 'കലഹിനീ ദമനകം' എന്ന പേരിൽ സ്വതന്ത്ര മലയാള വിവർത്തനം തയ്യാറാക്കിയത് ആര് ?
- 2) കൃമാരനാശാന്റെ കരുണ സംഗീത നാടകമായി അവതരിപ്പിച്ചത് ആര് ?
- 3) എ ഡോൾബി ഹൗസ് ആരുടെ നാടകമാണ് ?
- 4) കെ. സി. കേശവപിള്ള രചിച്ച മലയാള സംഗീതനാടകം ഏത് ?
- 5) സി. ജെ. തോമസ് രചിച്ച എപിക് തിയേറ്റർ മാതൃകയിലുള്ള നാടകമേത് ?
- 6) കാക്കാനും കാക്കാത്തിനും തമ്മിലുള്ള സംഭാഷണത്തിലൂടെ വികസിക്കുന്ന ഗ്രാമീണ നാടകമേതാണ് ?
- 7) മലയാള നാടക സാഹിത്യചരിത്രം ആരുടെ കൃതിയാണ് ?
- 8) കേരളത്തിലെ കുട്ടികളുടെ നാടകവേദികളിൽ ഏതെങ്കിലും ഒരെണ്ണത്തിന്റെ പേരെഴുതുക.
- 9) ലളിതാംബിക അന്തർജ്ജനം എഴുതിയ നാടകം ഏത് ?
- 10) അഭിനേത്രി എന്ന സൂരീ നാടക സംഘം രൂപീകരിക്കപ്പെട്ട വർഷം ഏത് ? (10×1=10 Marks)

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II. അരപ്പുറത്തിൽ കവിയാതെ 8 ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 11) പ്രസ്താവന.
- 12) വിമർശനസന്ധി.
- 13) ചന്ദ്രമുഖീവിലാസം.
- 14) അടക്കളയിൽ നിന്ന് അരങ്ങത്തേയ്ക്ക്.
- 15) പ്രേതങ്ങൾ.
- 16) പ്രോബ്ബം പ്ലേ (പ്രശ്നനാടകങ്ങൾ).
- 17) പാട്ടബാക്കി.
- 18) ക്ലൈമാക്സ്.
- 19) എപിക് തിയേറ്റർ.
- 20) കെ. പി. എ. സി.
- 21) പ്രഹസനങ്ങൾ.
- 22) സ്കൂൾ ഓഫ് ഡ്രാമ.

(8×2=16 Marks)

III. ഒരു പുറത്തിൽ കവിയാതെ ആറ് (6) ചോദ്യത്തിന് ഉത്തരമെഴുതുക.

- 23) മലയാളത്തിലെ രാഷ്ട്രീയ നാടകങ്ങളെക്കുറിച്ച് വിശദീകരിക്കുക.
- 24) രചനാപരമായ ഒരുക്കവും അനുഷ്ഠാനസങ്കല്പത്തിന്റെ ആഴങ്ങളും കാഴ്ചവയ്ക്കുന്ന കൃതിയാണ് ദൈവത്താർ. വിലയിരുത്തുക.
- 25) നമ്മുടെ നാടക ചരിത്രത്തിൽ അവഗണിക്കാനാവാത്ത അഭിരുചി സൃഷ്ടിച്ച ഒരു നാടക ധാരയാണ് സംഗീത നാടകങ്ങൾ - പരിശോധിക്കുക.
- 26) കേരളത്തിലെ നാടോടി നാടക പാരമ്പര്യത്തെ കുറിച്ച് വിശദീകരിക്കുക.
- 27) “ബുദ്ധിയുള്ളവർക്ക് കാര്യം ഗ്രഹിക്കാൻ വിഷമം ഇല്ലല്ലോ” - ശേഖരൻ ഇങ്ങനെ പറയുന്നതിന് പിന്നിലെ സാംഗത്യം പരിശോധിക്കുക.
- 28) “ഒരു മാൻകിടാവിനെത്തേടി അരണ്യം മുഴുവൻ അദ്ദേഹം അലഞ്ഞിട്ടുണ്ടല്ലോ. ആ മാൻകിടാവിനുവേണ്ടി ഒരു മഹായുദ്ധം തന്നെ നടത്തിയില്ലേ?” - വിശദീകരിക്കുക.
- 29) “ഈശ്വരനാകുന്ന ആദ്യത്തേയും അവസാനത്തേയും മനുഷ്യൻ ഞാനാവട്ടെ” - സൂചന വ്യക്തമാക്കുക.
- 30) ദുരന്തനാടകങ്ങളുടെ ലക്ഷ്യം എന്താണ്?
- 31) നവീന നാടക സങ്കല്പങ്ങൾ - കുറിപ്പ് തയ്യാറാക്കുക.

(6×4=24 Marks)



IV. മൂന്നു പുറത്തിൽ കവിയാതെ രണ്ടെണ്ണത്തിന് ഉത്തരം എഴുതുക.

- 32) മലയാളത്തിലെ ആദ്യത്തെ മാനസികാപഗ്രഥന നാടകമെന്ന നിലയിൽ 'ബലാബല'ത്തെ വിലയിരുത്തുക.
- 33) ശ്രീകണ്ഠൻ നായരുടെ രാമായണ പര്യടനത്തിലെ ആർദ്രവും ഊഷ്മളവുമായ രംഗങ്ങളാണ് കാഞ്ചന സീതയിൽ അവതരിപ്പിച്ചിരിക്കുന്നത് - അപഗ്രഥിക്കുക.
- 34) സ്മിനാടകവേദി മലയാള നാടകവേദിക്കു നൽകിയ സംഭാവനകൾ വിശകലനം ചെയ്യുക.
- 35) പ്രാചീന രംഗകലകളുടെയും കേരളീയ താളക്രമങ്ങളുടെയും സന്നിവേശനം 'ദൈവത്താർ' എന്ന നാടകത്തിൽ എത്ര കണ്ട് സമ്യുചിതമായി നിർവഹിച്ചിട്ടുണ്ടെന്ന് പരിശോധിക്കുക.

(2×15=30 Marks)



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Reg. No. :

Name :

**Fifth Semester B.A. Degree Examination, December 2017
(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)**

Max. Marks : 80

Time : 3 Hours

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

- 1) Silhouette
- 2) EFP
- 3) ISO
- 4) Cut
- 5) Shooting script
- 6) Chroma key
- 7) Adobe Sound Forge
- 8) Aerial shot
- 9) Promo
- 10) Jib arm.

(10×1=10 Marks)

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

- 11) J. L. Baird
- 12) Terrestrial transmission
- 13) Low angle shot
- 14) Art direction
- 15) Character generator
- 16) SITE
- 17) Digital transmission
- 18) Outdoor shooting

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- 19) Continuity
- 20) One line concept
- 21) Voice over
- 22) The rule of thirds.

(8×2=16 Marks)

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

- 23) Argue the importance of storyboarding in television programme production.
- 24) Describe the important guidelines for composition of shots.
- 25) Elaborate the important principles of sound mixing.
- 26) What are the important types of microphones used in TV studio ?
- 27) Explain the contributions of BGM to a TV programme.
- 28) Define dubbing. What are its advantages over live recording ?
- 29) Elaborate the important types of TV cameras and explain their features.
- 30) Compare the advantages and disadvantages of linear and nonlinear editing.
- 31) Analyse the various transition devices.

(6×4=24 Marks)

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

- 32) 'Post production work of a TV programme is the most laborious and painstaking effort'. Comment.
- 33) What are the important principles of editing ? Explain them with examples.
- 34) Describe the camera movements and the effects they generate in a programme.
- 35) Explain the three point lighting system. How does lighting contribute to the overall mood, tone and meaning of a TV programme ?

(2×15=30 Marks)



Reg. No. :

Name :

**Fifth Semester B.A. Degree Examination, December 2017
(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

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

1. Persistence of vision.
2. Casting.
3. Kinetograph.
4. Scene.
5. Panning.
6. George Melies.
7. Rough cut.
8. Flashback.
9. Nickelodeon.
10. Bicycle Thieves. (10×1=10 Marks)

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

11. Mise-en-scène.
12. Rule of thirds.
13. Tilting.
14. Avant-garde film.
15. Dissolve.

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16. Cinema verite.
17. Neorealism.
18. Direct sound.
19. Special effects.
20. Akira Kurosawa.
21. Film Censor Board.
22. Animation.

(8×2=16 Marks)

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

23. Briefly explain the different camera angles.
24. Elucidate the three-point lighting.
25. What are the different genres of documentary films ?
26. "Science fiction films grab young audience globally". Comment.
27. "Film is an art". Discuss.
28. Write a brief profile of an acclaimed Indian film director of your choice.
29. What are the major film movements ? Delineate the philosophies that guided them.
30. Assess the contributions of Charlie Chaplin in world cinema.
31. Middle stream cinema in Malayalam has created its own middle path in between commercial and art cinema", Comment.

(6×4=24 Marks)

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

32. Elucidate the different types of shots. How does each of them add to the meaning of films ?
33. Elaborate the principles and procedures, of film editing. List the equipment used in film editing.
34. Trace the origin of cinema by elaborating the early inventions that led to the birth of the medium.
35. Explain the various stages of filmmaking.

(2×15=30 Marks)



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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Group 2(a) : Botany and Biotechnology
Core Course – IX
BB 1541 : PLANT PHYSIOLOGY
(2013 and 2014 Admission)

Time : 3 Hours

Max. Marks : 80

Instruction : Draw diagrams *wherever* necessary.

SECTION – A

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

- 1) What is porphyrin ring ?
- 2) Fruit ripening hormone.
- 3) Define guttation.
- 4) Growth inhibitor.
- 5) Root pressure.
- 6) Name a trace element. Mention its function.
- 7) Which is the most abundant enzyme seen in plants ?
- 8) Co factors.
- 9) GTP and its function.
- 10) What are unsaturated fatty acids ? Give an example. **(10×1=10 Marks)**

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SECTION -B

II. Answer **any eight** questions, **not** to exceed a paragraph. **Each** question carries **two** marks.

- 11) Define plasmolysis. What is incipient plasmolysis ?
- 12) What is water stress ? How do plants respond to this ?
- 13) Write a brief account on differentiation and morphogenesis.
- 14) What are the features of long day plants ?
- 15) Solution culture.
- 16) Protoplasmic streaming theory.
- 17) Give an account of symbiotic nitrogen fixation.
- 18) Explain nyctinastic plants.
- 19) Give a brief account of CAM plants.
- 20) Explain the physiological role of cytokinins.
- 21) Sigmoid curve.
- 22) Competitive inhibition.

(8×2=16 Marks)

SECTION - C

III. Answer **any six** questions, **not** to exceed **120** words. **Each** question carries **four** marks.

- 23) IUB system of classification of enzymes with examples.
- 24) Discuss Red drop phenomenon and Emerson enhancement effect.
- 25) What is the significance of photorespiration ? Where does it occur ?
- 26) Mention the source of oxygen liberated in photosynthesis.
- 27) Explain cyclic photo phosphorylation and its significance.
- 28) Give a short note on biological clock with examples.
- 29) Vernalization and its applications.
- 30) Physiological effect of salinity stress.
- 31) Mechanism of water absorption in plants.

(6×4=24 Marks)



SECTION – D

IV. Write essay on **any two** of the following. **Each** question carries **15** marks.

- 32) Define transpiration. Mention the types and describe the stomatal mechanism.
- 33) With the help of schematic representation, describe the major steps in tricarboxylic acid cycle. Mention the enzymes involved. Add a note on the energy yield in the process.
- 34) Give an account on the types, causes and methods of breaking seed dormancy.
- 35) Explain the mechanism of synthesis and degradation of fatty acids.

(2×15=30 Marks)



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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017

(Career Related First Degree Programme Under CBCSS)

Group 2(a) : Botany and Biotechnology

Core Course – X

BB 1542 : GENETICS

(2013 and 2014 Admission)

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. **(10×1=10 Marks)**

1. What are complementary genes ?
2. What is a cistron ?
3. Explain test cross.
4. What is synaptonemal complex ?
5. What is chromosome mapping ?
6. Write genotypic ratio in dihybrid ratio.
7. What is Rh factor ?
8. Give an example for incomplete dominance.
9. Explain central dogma.
10. Define allele.

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SECTION - B

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

11. Explain polygenic inheritance.
12. Write about supercoiling of DNA.
13. Differentiate interference and coincidence.
14. What are transposons ?
15. Give an account of complementary genes.
16. What are split genes ?
17. Explain satellite DNA.
18. Write an account of Turners syndrome.
19. What is law of segregation ?
20. Write a short note on different forms of DNA.
21. Explain significance of RNA primer.
22. Give a short note on mapping of chromosomes.

SECTION - C

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

23. Explain genetic code and its significance.
24. Explain dominant epistasis.
25. Write about properties and functions of tRNA.
26. What is crossing over ?
27. Describe Messelson and Stahl experiment.
28. Write a note on Y linked inheritance.



29. Explain role of enzymes and proteins involved in replication of DNA.
30. Give an account of DNA repairing mechanism.
31. Explain ABO blood grouping in man.

SECTION – D

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

32. Explain the experiments done by Mendel. Mention the reasons for Mendel's success in his experiments.
 33. Illustrate the structure of DNA.
 34. Give an account of sex determination in higher plants and in Drosophila.
 35. Explain extra nuclear inheritance with examples.
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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Group 2 (a) Botany and Biotechnology
Vocational Course IX
BB 1571 : RECOMBINANT DNA TECHNOLOGY
(2013 and 2014 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Very short answer type; maximum **two** sentences; answer **all** the questions; **each** question carries **1** mark)

1. Name the enzyme used in recombinant DNA technology for preventing self-ligation of vector. This enzyme catalyzes the removal of 5' phosphate from DNA and RNA.
2. Which classes of vectors are generally used for the production of multiple single stranded copies of the insert DNA ?
3. 'UC' in pUC series vectors denotes what ?
4. In a research paper a bacterium is specified as $\text{amp}^s \text{ter}^r$. What does the notations indicate ?
5. What are genomic libraries ?
6. Indicate the structural difference between deoxyribo nucleotides and dideoxyribo nucleotides.
7. When we represent a plasmid vector using a sketch one area will be marked as 'ori' what does it mean ?
8. Write the full form of 'RAPD'.
9. Name the enzyme which is widely in genetic engineering to catalyze the formation of phosphodiester bonds between two DNA or RNA fragments. The enzyme is popularly known as the molecular splicing tape.
10. The Human Genome Project was initiated simultaneously and run parallelly by a public funded consortium and a private company. Which was the private company ?



SECTION – B

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

11. List out the major findings of Human genome project.
12. Name any one special type of DNA polymerase used in PCR technique. Why normal DNA polymerases are not suitable for this technique ?
13. Citing an example explain the concept of 'transgenic organisms'.
14. Define competent cells. List out the basic steps involved in the preparation of competent cells.
15. Differentiate between cosmids and phagemids.
16. Write a note on DNA microarray.
17. What are expression vectors ? Add a note on their unique features.
18. Write the full form of BAC. Mention the advantages of BAC.
19. Differentiate between endonucleases and exonucleases.
20. What is gene therapy ? Can it be used to treat diseases caused by pathogens. Why ?
21. Describe advantages of phage DNA based vectors over plasmid vectors.
22. With the help of examples differentiate between the actions of 'sticky end cutter' and 'blunt end cutter' types of restriction endonucleases.

SECTION – C

(Short essay type; **not** to exceed **120** words; answer **any six** questions; **each** question carries **4** marks)

23. What is insertional inactivation ? Explain how it is being used in genetic engineering to select transformed cells.
24. With the help of a labeled sketch explain the basic structure of pBR322.
25. What is cDNA ? Which enzyme is specially required for making cDNA ? List out the advantages of cDNA library.

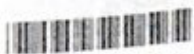


26. Write the full form of RFLP. List out the basic steps involved in RFLP.
27. List out the major requirements to set up a PCR reaction. Enumerate the basic steps followed in PCR to amplify a DNA sequence.
28. List out the applications of genetically modified animals.
29. Elaborate on the ethical concerns related to genetic engineering.
30. Explain the basic steps involved in the construction of a genomic DNA library.
31. Why wild type plasmids are not directly used as cloning vectors ?

SECTION – D

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

32. Explain the requirements and the basic steps involved in Sanger's dideoxy method of DNA sequencing.
 33. Describe the different vectorless methods of gene transfer into host organisms.
 34. 'High capacity cloning vectors behaves like true chromosomes' Citing YAC as an example explain the statement.
 35. Differentiate between Southern and Northern blotting techniques. With the help of a labeled sketch explain the basic procedure of Southern blotting.
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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Group 2(a) : Botany and Biotechnology
Vocational Course – X
BB 1572 : PLANT BIOTECHNOLOGY
(2013 and 2014 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A
(Very Short Answer Type)

- I. Maximum **two** sentences. Answer **all** questions : **(10×1=10 Marks)**
- 1) Define Callus.
 - 2) What are Millipore filters ?
 - 3) What is mean by anther culture ?
 - 4) Define Cybrids.
 - 5) What are pBR 322 ?
 - 6) Name any two chemicals used for surface sterilization of explants.
 - 7) Name any two cytokinins used in Plant tissue culture medium.
 - 8) What is Bt cotton ?
 - 9) What are restriction enzymes ?
 - 10) Name two commercially available biocontrol products.

SECTION – B
(Short Answer Type)

- II. Answer in **one** paragraph. Answer **any eight**. **(8×2=16 Marks)**
- 11) What are hairy root culture ? What is their use ?
 - 12) How explants are sterilized in plant tissue culture technique ?
 - 13) Differentiate between callus culture from suspension culture.

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- 14) Write short note wet sterilization methods followed in plant tissue culture.
- 15) Name any two methods of protoplast isolation.
- 16) What are the significance of embryo culture ?
- 17) Define totipotency. Who coined this term ?
- 18) What are the potential uses of artificial seeds ?
- 19) How virus free plants produced through tissue culture ?
- 20) Write short note on somatic embryogenesis.
- 21) What is meant by biological method of gene transfer ? Give an example.
- 22) Define biopharming ? What are its uses ?

SECTION – C
(Short Essay)

III. Answer should **not** exceed **120** words. Write **any six**. (6×4=24 Marks)

- 23) What are bioreactors ? What are the possible uses ?
- 24) Explain the various sterilization techniques followed in tissue culture.
- 25) Define micropropagation. What are its applications ?
- 26) Explain the impact of transgenic plants in agriculture and horticulture.
- 27) Explain virus mediated gene transfer in plants.
- 28) What are haploid plants ? How they are produced ?
- 29) Write notes on growth regulators and plant extracts used in plant tissue culture medium.
- 30) What are the merits and demerits of somaclonal variation ?
- 31) Explain the methods of products of any two transgenic plants.



SECTION - D
(Essay Type)

IV. Answer **any two** questions :

(2×15=30 Marks)

- 32) Explain the composition and preparation of MS medium. Mention the methods of sterilizing thermolabile media components used in plant tissue culture work.
 - 33) Write an essay on the role of *Agrobacterium tumefaciens* in plant genetic engineering.
 - 34) Describe the application of plant biotechnology in agriculture and horticulture.
 - 35) Explain briefly :
 - i) Various types of restriction endonucleases and their role in genetic engineering.
 - ii) Different types of cloning vectors, their properties and uses.
-



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D – 2701

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme Under CBCSS)
Group – 2(a) : Botany and Biotechnology
Vocational Course – XI
BB – 1573 : ANIMAL BIOTECHNOLOGY
(2013 and 2014 Admission)

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. **(10×1=10 Marks)**

1. Write about a method for cell synchronization.
2. What is thawing ?
3. Write two uses of collagenase.
4. Mention uses of coulter counter.
5. What is cloning ?
6. What is EDTA ?
7. What is Factor IX ?
8. Name a commonly used antibiotic in culture medium.
9. What is dedifferentiation ?
10. What is a cell line ?

P.T.O.



SECTION - B

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

11. Give an account of Laminar air flow cabinet.
12. Write about the characteristic features of organ culture.
13. Write a short note on vaccine production.
14. Explain how cross contamination of cell lines can be avoided ?
15. What is gene therapy ?
16. Give an account on wet heat sterilization.
17. What is a balanced salt solution ?
18. What are polyclonal antibodies ?
19. Write a note on CO₂ incubator.
20. Explain functions of t-plasminogen activator.
21. Mention commonly used substrate for growing cells.
22. Write about components of a synthetic media.

SECTION - C

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

23. Explain characteristic features of anchorage dependent cells and method of culture.
24. Give an account on ethical issues involved in animal cell culture.
25. Explain tissue grafting and its applications.
26. Explain virus culture.



27. Give an account of growth factors needed for proliferation of animal cells.
28. Explain how cell lines can be characterised ?
29. Write about interferons and its production.
30. Explain stem cell culture and its clinical application.
31. Write a note on expression of cloned proteins in animal cells.

SECTION - D

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

32. Explain methods for preservation and maintenance of animal cell culture.
 33. Explain hybridoma technology.
 34. Describe different types of media and physical parameters needed for animal cell culture.
 35. Give an account of bioreactors for large scale cultivation of animal cells.
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D – 2703

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)
Open Course – II

BB 1552/BV 1552 : FOOD AND DAIRY BIOTECHNOLOGY
(Common for Group 2 (a) : Botany and Biotechnology and
Group 2 (b) : Biotechnology)

Time : 3 Hours

Max. Marks : 80

I. Answer in **one** word to **two** sentences. **All** questions are **compulsory**.

- 1) Give the name of microorganism used in the production of Yoghurt.
- 2) What are the uses of protease in food processing ?
- 3) What are indicator organisms ?
- 4) What is leakage ?
- 5) Mention the important moulds in food spoilage.
- 6) What is radurization ?
- 7) Which one is called Dingri mushroom ?
- 8) What is Rennin ?
- 9) What are the microorganisms used in SCP ?
- 10) What is starter culture ?

(10×1=10 Marks)

P.T.O.



II. Answer **any eight** of the following; **not** to exceed **one** paragraph.

- 11) What are the difficulties in the production of Koji ?
- 12) Give an account of culture techniques.
- 13) What are the advantages of fermented food ?
- 14) How curd is separated from fermented milk ?
- 15) How can wood smoke preserve food ?
- 16) Describe Pasteurization.
- 17) What are the difficulties of using yeast in SCP ?
- 18) Mention the source of microorganisms in animal milk.
- 19) What is late blowing in cheese ?
- 20) What is aerobic type of food spoilage ?
- 21) What is asepsis ? Mention the different measures helpful in keeping the microbes away.
- 22) Food borne diseases and its prevention. (8×2=16 Marks)

III. Answer **any six** of the following; **not** to exceed **120** words.

- 23) Describe the process of fermentation in cheese production.
- 24) What are microbial toxins ? Write a short note on microbial toxins and food poisoning.
- 25) How does nutrient content affect microbial growth in food materials ?
- 26) How can you control the spoiling microorganisms of meat ?
- 27) Mention the role of organic acids in food preservation.



28) Write a short note on butter milk.

29) What do you mean by oriental foods ?

30) Write a short note on mycotoxins.

31) What are antioxidants ?

(6×4=24 Marks)

IV. Write an essay on **any two** of the following.

32) Discuss the role of enzymes in food industry.

33) What are the different methods of food preservation ?

34) What are the factors affecting the development of microbial contamination in food materials ?

35) Write an essay on industrial production of antibiotics and organic acids.

(2×15=30 Marks)



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Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2017
(Career Related First Degree Programme under CBCSS)

Group 2 (a) : Botany and Biotechnology

Core Course

BB 1541 : PLANT PHYSIOLOGY
(2015 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in **a** word or **one** or **two** sentences. **Each** question carries **one** mark : **(1×10=10 Marks)**

1. What are co-factors ?
2. What is cohesion ?
3. Who discovered gibberellins ?
4. What is facilitated diffusion ?
5. What is imbibition ?
6. What is hydroponics ?
7. What is Kranz anatomy ?
8. What is de vernalization ?
9. Name the stimulus in thigmotropism.
10. What is florigen ?

P.T.O.



SECTION - B

(2×8=16 Marks)

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

11. Difference between active and passive absorption.
12. What is guttation ?
13. Write two methods to overcome seed dormancy.
14. What is seismonasty ?
15. What is the role of CO_2 in transpiration ?
16. Differentiate absorption spectrum and action spectrum.
17. What are day neutral plants ?
18. What is the mechanism of phototropism ?
19. What is feed back inhibition ?
20. What is symbiotic nitrogen fixation ?
21. Write two difference between Chlorophyll a and Chlorophyll b.
22. What is dark reaction ?

SECTION - C

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

(4×6=24 Marks)

23. What are the various factors affecting transpiration ?
24. What are the differences between C_3 and C_4 plants ?
25. Explain cyclic photophosphorylation with illustrations.
26. Explain briefly IUB system of enzyme classification.
27. What are the different theories of passive absorption ?
28. What are the physiological effects of gibberellins ?