Seat No.

Ph.D. Course Work Examination March-2021
English (Paper – III)
MODERN TRENDS IN DRAMA NOVEL AND POETRY

Day & Date: Wednesday, 24-03-2021 Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1	**a)**	Discuss major characteristics of Post-Modernism in literature.	**10**
	b)	**Write a note on any two of the followings.**	**10**
		1) Modernism	
		2) Realism	
		3) Surrealism	
Q.2	**a)**	What are salient features of the Epic Theatre?	**10**
	b)	**Write a note on any two of the followings.**	**10**
		1) Dada as a literary and artistic movement	
		2) Theatre of the Absurd	
		3) The Symbolic Movement	
Q.3	**a)**	Discuss *Waiting for Godot* as an absurd play.	**10**
	b)	**Write a note on any two of the followings.**	**10**
		1) Swiss Cheese	
		2) Mother Courage	
		3) Kattrin	
Q.4	**a)**	Write an essay on issue of racism in *The Grass Is Singing*.	**10**
	b)	**Write a note on any two of the followings.**	**10**
		1) Title of *A Portrait of the Artist as a Young*	
		2) Stephen	
		3) Mary Dedalus	
Q.5	**a)**	How does Eliot describe the physical 'Waste Land' in this poem? What are some of its main features, and how are they connected to the symbolic wasteland of Western culture?	**10**
	b)	**Write a note on any two of the followings.**	**10**
		1) Theme of "Hawk Roosting"	
		2) Tragedy of Crow	
		3) Theme of "Pike"	

Seat No.

Ph.D. Course Work Examination March-2021
Hindi (Paper – III)
HINDI SAHITYA VIDHA – HINDI KAVYA

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

सूचनाएँ: 1) किन्हीं चार प्रश्नों के उत्तर लिखिए।
    2) दाईं ओर लिखे हुए अंक प्रश्न के पूर्णांक दर्शाते हैं।

प्र.1   प्रबंध काव्य के तत्त्वों का परिचय दीजिए।   **25**

प्र.2   'राम की शक्तिपूजा' में चित्रित राम।   **25**

प्र.3   'अंधेरे में' कविता का वस्तु और शिल्प सौंदर्य स्पष्ट कीजिए।   **25**

प्र.4   'द्रौपदी' खंडकाव्य के कथ्य को प्रकाशित कीजिए।   **25**

प्र.5   'अकाल में सारस' में अभिव्यक्त विचारों को स्पष्ट कीजिए।   **25**

प्र.6   निम्नलिखित में से किन्हीं दो पर टिप्पणियाँ लिखिए।   **25**
    1)   काव्य के तत्त्व।
    2)   तुलसीदास।
    3)   काव्य का कला पक्ष।
    4)   द्रौपदी का चरित्र–चित्रण कीजिए।

Seat No.

Ph.D. Course Work Examination March-2021
Hindi (Paper – III)
HINDI SAHITYA VIDHA - HINDI KATHA SAHITYA

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

सूचनाएँ : 1) सभी प्रश्न अनिवार्य है।
       2) सभी प्रश्नों को समान अंक है।

प्र.1   अ) उपन्यास की परिभाषाओं का विवेचन कीजिए।   **10**

अथवा

नई कहानी आंदोलन को स्पष्ट कीजिए।

ब) निम्नलिखित में से किन्ही दो के उत्तर लिखिए।   **10**
1) दलित कहानी साहित्य।
2) प्रेमचंदकालीन उपन्यास।
3) कहानी तत्त्व पात्र तथा चरित्र चित्रण।

प्र.2   अ) ''लौटते हुए मुसाफिर'' की समीक्षा कीजिए।   **10**

अथवा

''कगार की आग'' का सामाजिक पक्ष।

ब) निम्नलिखित में से किन्ही दो के उत्तर लिखिए।   **10**
1) ''सेवासदन'' प्रमुख स्त्री पात्र।
2) ''लौटते हुए मुसाफिर'' की शीर्षक सार्थकता।
3) ''कगार की आग'' कथोपकथन तथा संवाद योजना।

प्र.3   अ) ''कगार की आग'' उपन्यास का उद्देश्य लिखिए।   **10**

अथवा

''लौटे हुए मुसाफिर'' का देशकाल वातावरण पर प्रकाश डालिए।

ब) निम्नलिखित में से किन्हीं दो के उत्तर लिखिए।   **10**
1) ''लौटते हुए मुसाफिर'' का सामाजिक पक्ष।
2) ''कगार की आग'' का संघर्ष।
3) ''लौटते हुए मुसाफिर'' का स्त्री जीवन।

प्र.4   अ) ग्रामीण जीवन की विसंगतियों को बडी बेबाकी के साथ विवेकीराय चित्रित करते   **10**
हैं उनकी पठित कहानियों के आधार पर स्पष्ट कीजिए।

अथवा

''टूटते वहम है'' की कहानियाँ उपेक्षित, दलित जीवन की व्यथाओं का अंकन
करती है। कहानियों के आधार पर स्पष्ट कीजिए।

ब) निम्नलिखित में से किन्हीं दो के उत्तर लिखिए।   **10**
1) सिलिया।
2) ''नई राह की खोज'' का पात्र परिचय।
3) ''धूप से बडा'' की संवाद योजना।

प्र.5 अ) ''ललमणियाँ तथा अन्य कहानियाँ'' में चित्रित नारी जीवन का विवेचन कीजिए। **10**

अथवा

सुशीला टाकभौरे की पठित कहानियों में चित्रित नारी समस्याओं का चित्रण कीजिए।

ब) निम्नलिखित में से किन्हीं दो के उत्तर लिखिए। **10**

1) ''बिछुडे हुए'' कहानी नारी पात्र विशेषता।
2) ''मुझे जबाब देना है'' कहानी की कथावस्तु।
3) ''बेटी'' कहानी की शीर्षक सार्थकता।

Seat No.

Ph.D. Course Work Examination March-2021
Hindi (Paper – III)
HINDI SAHITYA VIDHA - HINDI EKANKI, NATAK SAHITYA

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

सूचनाएँ: 1) किन्हीं चार प्रश्नों के उत्तर लिखिए।
            2) सभी प्रश्नों को समान अंक है।

प्र.1 हिन्दी नाटक के उद्भव एवं विकास की चर्चा करते हुए 'भारतेन्दु युग' के योगदान पर   **25**
       प्रकाश डालिए।

प्र.2 'मिस्टर अभिमन्यु' मिथकीय नाटक की प्रतीकात्मकता पर प्रकाश डालिए।   **25**

प्र.3 ''शुतुरमुर्ग' वर्तमानकालीन राजनीतिक व्यवस्थापर करारा व्यंग्य करनेवाला नाटक है''–   **25**
       इस कथन की चर्चा कीजिए।

प्र.4 'अंधायुग' गीतिनाटय् की व्यंग्यात्मकता को नाटक के आधारपर स्पष्ट कीजिए।   **25**

प्र.5 'मीना कहाँ है' एकांकी के शिल्पविधान पर प्रकाश डालिए।   **25**

प्र.6 किन्हीं दो पर टिप्पणियाँ लिखिए।   **25**
       1) 'मिस्टर अभिमन्यु' का गयादत्त।
       2) 'पडोसिन का कोट' का कथ्य।
       3) 'महाभारत की एक साँझ' का युधिष्ठिर।
       4) 'एकांकी–कुंज' एकांकी संग्रह की किसी एक एकांकी के शीर्षक की सार्थकता।

Seat No.

Ph.D. Course Work Examination March-2021
History (Paper – III)
MODERN TOPICS IN HISTORY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.

Q.1	**a)**	Explain the Philosophy of Buddhism.	**10**
	b)	**Write short notes. (Any Two)**	**10**
		1) Jain Philosophy	
		2) Religious Condition of Vedic Period	
		3) Third Dhamma Parishad	
Q.2	**a)**	Write an essay on the Gupta's Art and Architecture.	**10**
	b)	**Write short notes. (Any Two)**	**10**
		1) Archaeological sources Ancient Indian History	
		2) Mauryan Art and Architecture	
		3) Satvahans Art and Architecture	
Q.3	**a)**	Describe the sources of Medieval Indian History.	**10**
	b)	**Write short notes. (Any Two)**	**10**
		1) Life of a Muslim women's in Medieval Period	
		2) Bhakti Movements	
		3) Land Revenue system under the Mughal Period	
Q.4	**a)**	Write an essay on the Chh. Shivaji Maharaj Revenue System.	**10**
	b)	**Write short notes. (Any Two)**	**10**
		1) Social life in Medieval Maharashtra	
		2) Rise of social causes in Maratha Power	
		3) Work of Marathi Sant's	
Q.5	**a)**	Explain the British Administration.	**10**
	b)	**Write short notes. (Any Two)**	**10**
		1) Dalit Movements	
		2) Peasant Movements	
		3) Labour Movements	

Seat No.

Ph.D. Course Work Examination March-2021
Economics (Paper – III)
MODERN THEORIES IN ECONOMICS

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 **a)** Explain the Behavioral Model of Cyert and March Goals of Firm. **10**
b) **Write short notes on any two of the following.** **10**
  1) Maximum rate of Growth
  2) Profits Hypothesis of Marris
  3) IS analysis

Q.2 **a)** Discuss the determinats of balance of Payments. **10**
b) **Write short notes on any two of the following.** **10**
  1) Monopolistic competition
  2) Role of Monetary policy in economic growth
  3) Merits of Flexible Exchange rates

Q.3 **a)** Discuss the Ramsay's rule. **10**
b) **Write short notes on any two of the following.** **10**
  1) Kinked demand curve
  2) Hall and Hitch report
  3) Capital controversy

Q.4 **a)** Explain the Managerial discretion Model of Williamson. **10**
b) **Write short notes on any two of the following** **10**
  1) Solow Growth Model
  2) Contribution of Hicks in growth theory
  3) Critical evaluation of Chamberlain's Model

Q.5 **a)** Explain the Maximum rate of Growth and Profits Hypothesis of Marris. **10**
b) **Write short notes on any two of the following** **10**
  1) New endogenous growth
  2) Flexible Exchange rates
  3) Workable competition

Seat No.	

Ph.D. Course Work Examination March-2021
Economics (Paper – III)
ECONOMICS OF AGRICULTURE AND CO-OPERATIVES

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                 2) All questions carry equal marks.

Q.1   **a)**   Explain the role of Co-operative credit in Agricultural development.   **10**
       b)   **Answer in short (Any Two)**   **10**
           1) Output-Output relationship
           2) Precision Farming
           3) Co-operative Values

Q.2   **a)**   State the role of Co-operatives in India.   **10**
       b)   **Answer in short (Any Two)**   **10**
           1) Organic Farming
           2) Animal Husbandry
           3) Sugar Co-operatives

Q.3   **a)**   Explain the sources of Agricultural Finance.   **10**
       b)   **Answer in short (Any Two)**   **10**
           1) Urban Co-operative Banks
           2) Leadership in Co-operative Organization
           3) Fai-Ranis Model

Q.4   **a)**   Describe the role of recent technological changes in Agricultural development.   **10**
       b)   **Answer in short (Any Two)**   **10**
           1) Mellor Theory
           2) Agro Processing Industries
           3) Globalization and Co-operatives

Q.5   **a)**   Explain the Law of Diminishing Returns.   **10**
       b)   **Answer in short (Any Two)**   **10**
           1) Dairy Co-operatives
           2) HRD in Co-operatives
           3) Food Security

Ph.D. Course Work Examination March-2021
Economics (Paper – III)
ECONOMICS OF INDUSTRY & LABOUR

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.

Q.1   **a)** State the importance of Small Scale Industry in Indian Economy.   **10**
       b) **Answer the following questions in short. (Any Two)**   **10**
           1) Discuss on economies of scale
           2) Discuss on U shaped and L shaped cost curve
           3) Types of Small Scale industries

Q.2   **a)** Discuss on marginal cost pricing vs. full cost pricing.   **10**
       b) **Answer the following questions in short. (Any Two)**   **10**
           1) State the objectives of firm.
           2) Discuss on pricing power and public interest.
           3) State the role of risk and uncertainty in pricing.

Q.3   **a)** Discuss on growth and structure of the Indian Corporate Sector.   **10**
       b) **Answer the following questions in short. (Any Two)**   **10**
           1) Types of finance
           2) Discuss on Capital market.
           3) Discuss on Traditional Vs. Present day capitalism

Q.4   **a)** State the Nature and Characteristics of labour markets in India.   **10**
       b) **Answer the following questions in short. (Any Two)**   **10**
           1) Discuss on choice of technology and government labour policies.
           2) State the paradigms of labour market.
           3) Discuss on supply of labour in relation to growth of labour force.

Q.5   **a)** Discuss on labour welfare practices in India.   **10**
       b) **Answer the following questions in short. (Any Two)**   **10**
           1) Discuss on Wage and inflation.
           2) Discuss on Productivity and wage determination.
           3) Discuss on classical theory of wage determination.

Seat No.	

Ph.D. Course Work Examination March-2021
Economics (Paper – III)
ECONOMICS OF AGRICULTURE AND CO-OPERATION

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　 2) Figures to the right indicate full marks.

Q.1　**a)**　Explain the role of agriculture in economic development.　　**10**
　　　b)　**Answer in short. (Any Two)**　　　　　　　　　　　　　**10**
　　　　　1)　Explain growth with social justice.
　　　　　2)　Explain production function.
　　　　　3)　Explain new technology and shift in production function.

Q.2　**a)**　Explain the role of infrastructure in agricultural development.　**10**
　　　b)　**Answer in short. (Any Two)**　　　　　　　　　　　　　**10**
　　　　　1)　Explain irrigation policy of India.
　　　　　2)　Explain organic farming.
　　　　　3)　Explain contract farming.

Q.3　**a)**　Explain eco-friendly practices in agriculture.　　　　　　**10**
　　　b)　**Answer in short. (Any Two)**　　　　　　　　　　　　　**10**
　　　　　1)　Explain watershed development in India.
　　　　　2)　Explain dry land farming.
　　　　　3)　Explain the concept of sustainable agriculture.

Q.4　**a)**　Explain the problems of agro industries in India.　　　　　**10**
　　　b)　**Answer in short. (Any Two)**　　　　　　　　　　　　　**10**
　　　　　1)　Explain the sources of agricultural finance.
　　　　　2)　Explain the principles of better credit.
　　　　　3)　Explain the role of cooperative credit.

Q.5　**a)**　Examine the cooperative movement in Maharashtra.　　　**10**
　　　b)　**Answer in short. (Any Two)**　　　　　　　　　　　　　**10**
　　　　　1)　Explain Animal Husbandry.
　　　　　2)　Explain Horticulture.
　　　　　3)　Explain Floriculture.

Seat
No.

Ph.D. Course Work Examination March-2021
Economics (Paper – III)
ECONOMICS OF AGRICULTURE AND CO-OPERATION

Day & Date: Wednesday, 24-03-2021 Max. Marks: 100
Time: 11.00 AM to 02.00 PM

सूचनाः 1) सर्व प्रश्न आवश्यक आहे.
2) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र. 1	अ)	आर्थिक विकासातील कृषीची भूमिका स्पष्ट करा.	10
	ब)	थोडक्यात उत्तरे लिहा. (कोणतेही दोन)	10
		1) सामाजिक न्यायासह विकास स्पष्ट करा.	
		2) उत्पादन फलन स्पष्ट करा.	
		3) नवीन कृषी तंत्रज्ञान आणि उत्पादन फलातील बदल स्पष्ट करा.	
प्र.2	अ)	कृषी विकासातील संरचनेची भूमिका स्पष्ट करा.	10
	ब)	थोडक्यात उत्तरे लिहा. (कोणतेही दोन)	10
		1) भारताचे जल सिंचन धोरण स्पष्ट करा.	
		2) सेंद्रिय शेती स्पष्ट करा.	
		3) करार शेती स्पष्ट करा.	
प्र.3	अ)	शेतीतील पर्यावरण मैत्रीपूर्वक घडामोडी स्पष्ट करा.	10
	ब)	थोडक्यात उत्तरे लिहा. (कोणतेही दोन)	10
		1) भारतातील पाणलोट क्षेत्र विकास स्पष्ट करा.	
		2) कोरडवाहू शेती स्पष्ट करा.	
		3) शाश्वत शेतीची संकल्पना स्पष्ट करा.	
प्र.4	अ)	भारतातील कृषी उद्योगाच्या समस्या स्पष्ट करा.	10
	ब)	थोडक्यात उत्तरे लिहा. (कोणतेही दोन)	10
		1) कृषी पतपुरवठ्याचे स्त्रोत स्पष्ट करा.	
		2) उत्तम पत पुरवठ्याची तत्त्वे स्पष्ट करा.	
		3) सहकारी पत पुरवठ्याची भूमिका स्पष्ट करा.	
प्र.5	अ)	महाराष्ट्राच्या सहकारी चळवळीचे परीक्षण करा.	10
	ब)	थोडक्यात उत्तरे लिहा. (कोणतेही दोन)	10
		1) पशु संवर्धन स्पष्ट करा.	
		2) फळशेती स्पष्ट करा.	
		3) फुलशेती स्पष्ट करा.	

Seat No.	

Ph.D. Course Work Examination March-2021
Social Work (Paper – III)
SOCIAL WORK AND SOCIAL DEVELOPMENT

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.

Q.1 **a)** Describe the importance of People's participation in Social Development.   **10**
      b) **Short Answer Questions (Any Two)**   **10**
           1) Write on Social Development.
           2) Explain on Poverty and Inequality in India.
           3) Highlight on Globalization and its impact on Society.

Q.2 **a)** Describe the thoughts of Dr. B. R. Ambedkar on Special Justice.   **10**
      b) **Short Answer Questions (Any Two)**   **10**
           1) Concept of Social Justice
           2) Write on Social Legislation.
           3) Describe Fundamental Rights in Constitution of India.

Q.3 **a)** Write on Patriarchal structure and its impact.   **10**
      b) **Short Answer Questions (Any Two)**   **10**
           1) Highlight various indicators of Women Development
           2) Write on importance of Gender equality.
           3) What is Gender Budgeting?

Q.4 **a)** Describe on various Social action models.   **10**
      b) **Short Answer Questions (Any Two)**   **10**
           1) Explain Crisis intervention.
           2) Write on Behaviour Modification.
           3) Concept of Counselling and its application

Q.5 **a)** Describe the levels of measurements used in Research.   **10**
      b) **Short Answer Questions (Any Two)**   **10**
           1) Write on Social work Research.
           2) Explain on Steps in Social work Research.
           3) Discuss various types of Social work Research.

Seat No.

Ph.D. Course Work Examination March-2021
Journalism & Mass Communication (Paper – III)
MASS COMMUNICATION IN NEW MILLENNIUM

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                         2) Figures to the right indicate full marks.

Q.1 **a)** Explain in detail about Development Communication with two suitable Examples.   **10**

  b) **Short Answer Questions (Any Two)**   **10**
        1) Green Journalism
        2) Right to Information
        3) Models of development Communication

Q.2 **a)** What do you mean by Sustainable Development give some Examples which you know?   **10**

  b) **Short Answer Questions (Any Two)**   **10**
        1) New Media impact on old Media
        2) MacBride Commission
        3) Citizen Journalism and beyond

Q.3 **a)** Write effects on globalization on media system as a Researcher View?   **10**
  b) **Short Answer Questions (Any Two)**   **10**
        1) UNESCO and his work
        2) International News Agencies work
        3) Indian Media and Political change

Q.4 **a)** Write work of World Environment Summits last one Decade in Details?   **10**
  b) **Short Answer Questions (Any Two)**   **10**
        1) Characteristics of Information Society
        2) Mobile Journalism New Trends
        3) Post-industrial society

Q.5 **a)** What is exact different between Folk Media and Mass Media give Two example of each Media?   **10**
  b) **Short Answer Questions (Any Two)**   **10**
        1) Information Rich and Information Poor
        2) Social Networking
        3) Role of Media in Social Change

**Seat
No.**

Set | **P**

Ph.D. Course Work Examination March-2021
Education (Paper – III)
ADVANCED DEVELOPMENT IN EDUCATION

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Figures to the right indicate full marks.

Q.1 **a)** State the various western schools of Philosophy of Education and Discuss **10**
the 'Naturalism' as western school of Philosophy of Education.
b) **Short Answer Questions. (Any Two)** **10**
1) Write a structure of Teacher Education Programme as per NCFTE – 2010.
2) Explain the role of Education for Peace.
3) Explain the Social Learning Theory by *Bandura*.

Q.2 **a)** Explain the Four Pillars of Education stated by Dellor's commission. **10**
b) **Short Answer Questions. (Any Two)** **10**
1) What is meant by Philosophy? Explain the nature of Philosophy of Education.
2) Write short note on 'Economics of Production and Cost'.
3) What is Knowledge Society? Explain the role of Education for Knowledge Society.

Q.3 **a)** Illustrate the life skills suggested by WHO. **10**
b) **Short Answer Questions. (Any Two)** **10**
1) Explain the 'Programme Of Action (POA) – 1992'.
2) Write a short note on – 'Decentralization of Funding'.
3) Write the objectives and need of Human Right Education.

Q.4 **a)** What is meant by Economics of Education? Explain the financial funding **10**
agencies for Indian Higher Education.
b) **Short Answer Questions. (Any Two)** **10**
1) Explain the silent features of National Policy on Education-1986.
2) "Education is the best medium of eradication of corruption'' justify it.
3) What is Thought Process? Write the components and levels of Thought Process.

Q.5 **a)** What is the concept of Value Education? Explain the importance of Value **10**
Education.
b) **Short Answer Questions. (Any Two)** **10**
1) Write the educational importance of Gestalt Theory.
2) Explain the curriculum organization of higher secondary level by National Policy Education-2002.
3) Explain the role of education in Eradication of Terrorism.

Seat No.		**Set**	**P**

Ph.D. Course Work Examination March-2021
Education (Paper – III)
INCLUSIVE EDUCATION (NEW)

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 a) What should be the causes of socially handicapped? Explain how can maladjustment be prevented?   **20**

OR

b) Explain children with learning Disorders and Explain identification of special needs of children.

Q.2 a) Explain use of ICT in teaching? Explain the benefits of ICTs in inclusive schools.   **20**

OR

b) Write merits of inclusive education and explain effective teaching practices for students in inclusive classroom

Q.3 a) Write the concept of impairment?   **10**
b) Write Collaborative Practices in Inclusive Education.   **10**

OR

a) Explain Management of inclusive classroom.   **10**
b) Write goals of Sarva Shiksha Abhiyan.   **10**

Q.4 Write a short note. (Any Five)   **40**
a) Rehabilitation strategies
b) Concept of Impairment and Disability
c) What is Co-operative learning?
d) Role of teacher in evaluation for diverse learners
e) Characteristics of learning disabled children
f) Evaluation report of diverse learners
g) Use of ICT for diverse learners

Seat No.	

Ph.D. Course Work Examination March-2021
Education (Paper – III)
TEACHER EDUCATION (NEW)

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
             2) Figures to the right indicate full marks.

Q.1 a) Explain concept of Teacher Education and discuss aims of Teacher Education. **10**

   b) Answer in short. (Any Two) **10**
      1) Write merits and demerits of distance mode of Teacher Education.
      2) Explain functions of NCTE.
      3) Write major functions of NCERT.

Q.2 a) Explain use of technology in professional development of teachers. **10**
   b) Answer in short. (Any two) **10**
      1) Teacher Education in NPE 2020
      2) Explain concept of career development.
      3) Write short note on: Importance of Grievance committee at institutional level.

Q.3 a) Which innovative transaction modes are used in Teacher Education? Explain in detail any two of them. **10**
   b) Answer in short. (Any two) **10**
      1) Write review of few recent research studies in Teacher Education Programme.
      2) Explain how self learning packages can be developed in teacher training.
      3) Explain use of media in Teacher Education.

Q.4 a) Which components determine teacher effectiveness? Explain in detail any two of them. **10**
   b) Write short note. (Any two) **10**
      1) Teacher Thought Process
      2) Researches in Teacher Education
      3) Decision making in classroom

Q.5 a) Explain Quality Assurance in Teacher Education. What measures are taken by Government of India for quality in teacher education? **10**
   b) Answer in short. (Any two) **10**
      1) Write importance of portfolio in Teacher Education.
      2) Write importance of teacher's accountability.
      3) What are your expectations from Teacher Education Programme in NPE 2020?

Seat No.

Ph.D. Course Work Examination March-2021
Commerce (Paper – III)
ADVANCED DEVELOPMENT IN HUMAN RESOURCE MANAGEMENT

Day & Date: Wednesday, 24-03-2021 Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
2) All questions carry equal marks.

Q.1 **a)** What is Human Resources Management? Discuss the Evolution of HRM. **10**
   b) **Write short notes on (Any Two)** **10**
   1) Scope of Human Resource Management
   2) Functions of Human Resource Development
   3) Process of Human Resource Planning

Q.2 **a)** What is Job Analysis? Discuss various uses of Job Analysis. **10**
   b) **Write short notes on (Any Two)** **10**
   1) Problems in Job Description
   2) Importance of Job Design
   3) Advantages of Job Rotation

Q.3 **a)** What is Selection? Describe the procedure of selection in an organization. **10**
   b) **Write short notes on (Any Two)** **10**
   1) Prerequisites of a Good Recruitment Policy
   2) How to Improve Work Life Balance?
   3) Gender Issues in HRM

Q.4 **a)** Define in detail How to develop emotional intelligence? **10**
   b) **Write short notes on (Any Two)** **10**
   1) Objectives of Training
   2) Importance of Executive Development
   3) Limitations of Performance Appraisal

Q.5 **a)** What is Polycentric Approach in international HRM? Discuss advantages of it. **10**
   b) **Write short notes on (Any Two)** **10**
   1) Importance of International HRM
   2) Disadvantages of the Geocentric Approach
   3) Criteria for selecting staff for International assignments

Seat No.

Set | **P**

Ph.D. Course Work Examination March-2021
Physics (Paper – III)
SOLAR CELLS AND SUPER CAPACITOR

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1	**a)**	Give principal of DSSC solar cell. Explain TiO_2 DSSC with band diagram	**10**
	b)	**Attempt any two from the following.**	**10**
		1) Photovoltaic effect	
		2) Solid State Solar cells	
		3) Photo electrochemical solar cells	
Q.2	**a)**	Describe Chemical bath deposition technique of thin film formation with suitable example.	**10**
	b)	**Attempt any two from the following.**	**10**
		1) Multijunction Solar Cells	
		2) Internal photon conversion efficiency	
		3) Spectral response	
Q.3	**a)**	Describe electrochemical technique of preparation of supercapacitor electrode.	**10**
	b)	**Attempt any two from the following.**	**10**
		1) Regaon Plot	
		2) Symmetric Supercapacitor	
		3) Hybrid Supercapacitor	
Q.4	**a)**	Describe difference between supercapacitor and batteries with suitable example.	**10**
	b)	**Attempt any two from the following.**	**10**
		1) Polymer Supercapacitor	
		2) Electrochemical double layer super capacitor	
		3) Cyclic voltammetry	
Q.5	**a)**	Define solar cell? Explain short circuit current (Isc) and open circuit voltage (Voc) using I-V characteristics curve.	**10**
	b)	**Attempt any two from the following.**	**10**
		1) Metal semiconductor junction	
		2) Carbon Supercapacitor	
		3) Energy and Power density of SC	

| Seat No. | | | Set | **P** |

Ph.D. Course Work Examination March-2021
Physics (Paper – III)
ADVANCED DEVELOPMENT IN PHYSICS – SOLID STATE GAS SENSOR DEVICES

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                         2) Figures to the right indicate full marks.

Q.1 **a)** Describe gas sensing mechanism of chemorestive sensor with suitable example. **10**

     b) **Attempt any two from the following.** **10**
       1) Spillover mechanism
       2) FET gas sensor
       3) Role of fuels in the combustion synthesis method

Q.2 **a)** Describe sol-gel method of preparation of metal oxide gas sensor with suitable example. **10**

     b) **Attempt any two from the following.** **10**
       1) Physical and chemical adsorption
       2) Solid state gas sensors
       3) Role of Grain boundaries in electrical conduction

Q.3 **a)** Explain mechanism of solid electrolyte gas sensor with example. **10**
     b) **Attempt any two from the following.** **10**
       1) Reducing and oxidising gases
       2) Advantages of thin film sensor over pellet
       3) Spin coating technique

Q.4 **a)** Describe various performance characteristics and requirement of an ideal gas sensors. **10**

     b) **Attempt any two from the following.** **10**
       1) Thermal evaporation
       2) Effects of defects on gas sensing
       3) Spray pyrolysis

Q.5 **a)** Describe growth mechanism of 1D and 2D nanostructure with suitable examples. **10**

     b) **Attempt any two from the following.** **10**
       1) Demerits of semiconductor gas sensors
       2) Merits of thick film sensors
       3) Effect of grain size on gas sensing

Seat
No.

Ph.D. Course Work Examination March-2021
Zoology (Paper – III)
ADVANCED DEVELOPMENT IN ZOOLOGY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                2) All questions carry equal marks.
                3) Draw neat labeled diagrams wherever necessary.

Q.1 **a)** Discuss the process of biosynthesis of insulin and explain the effect of insulin on glucose metabolism with mechanism of action.   **10**

      b) **Write short notes. (Any Two)**   **10**
          1) Mechanism of reflex action
          2) Physiological anatomy of synapse
          3) Pituitary gland as master gland

Q.2 **a)** Discuss the different methods of risk preservation.   **10**
      b) **Write short notes. (Any Two)**   **10**
          1) Methods of control of parasites on fish
          2) Location of fish farm
          3) Economic values of fishes

Q.3 **a)** Describe the principles and methods of citric acid fermentation, and give the uses of citric acid.   **10**

      b) **Write short notes. (Any Two)**   **10**
          1) Advantages of microbial enzymes
          2) Enzyme inhibition
          3) Allosteric enzymes

Q.4 **a)** Write essay on modern synthetic theory of evolution.   **10**
      b) **Write short notes. (Any Two)**   **10**
          1) Geographic isolating mechanism
          2) Mechanism of Mega – evaluation
          3) Biochemical theory of origin of life

Q.5 **a)** Discuss the molecular basis of cell differentiations.   **10**
      b) **Write short notes. (Any Two)**   **10**
          1) Role of antisense technology in transgenesis
          2) Molecular events during fertilization
          3) Stem cells

Seat No.		Set	P

Ph.D. Course Work Examination March-2021
Geography (Paper – III)
RECENT TRENDS IN AGRICULTURAL GEOGRAPHY (NEW)

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                         2) Figures to the right indicate full marks.

Q.1 **a)** Describe major Genecentres of Agriculture in Asia.   **10**
         b) **Write short answers of any two of the following questions.**   **10**
                    1) Explain nature of Agricultural Geography.
                    2) Describe the Regional Approach.
                    3) Explain the Dairy Farming.

Q.2 **a)** Describe non - physical determinants of Agricultural pattern.   **10**
         b) **Write short answers of any two of the following questions.**   **10**
                    1) Explain scope of Agricultural Geography.
                    2) Explain concept of land capability.
                    3) Give the classification of General Land use.

Q.3 **a)** Define Agricultural region and explain methods of Agricultural   **10**
                  Regionalization.
         b) **Write short answers of any two of the following questions.**   **10**
                    1) Explain the mixed farming.
                    2) Explain the concept of Agricultural productivity.
                    3) Give the Quantitative techniques to determine Agricultural productivity.

Q.4 **a)** Discuss the problems of Agriculture in India.   **10**
         b) **Write short answers of any two of the following questions.**   **10**
                    1) Explain the Jonasson's Model.
                    2) Give significance of Agricultural Model.
                    3) Explain the interview method.

Q.5 **a)** Define sampling and explain sampling methods.   **10**
         b) **Write short answers of any two of the following questions.**   **10**
                    1) Source of secondary data collection for Agriculture Research
                    2) Explain the Intensive Farming.
                    3) Normative (Deductive) Approach

Seat No.		Set	**P**

Ph.D. Course Work Examination March-2021
Geography (Paper – III)
RECENT TRENDS IN ECONOMIC GEOGRAPHY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                 2) Figures to the right indicate full marks.

Q.1   **a)**   Write the classification of economic activities   **10**
      b)   **Short Answer Questions. (Any Two)**   **10**
          1)   What is economic geography?
          2)   Explain regional approach.
          3)   Explain Commodity approach.

Q.2   **a)**   Explain Alfred Weber's theory.   **10**
      b)   **Short Answer Questions. (Any Two)**   **10**
          1)   Critical evaluate Von Thunen model
          2)   Explain Behavioral location theory.
          3)   Explain Christall Raily gravitational model.

Q.3   **a)**   What is resource? Describe its classification.   **10**
      b)   **Short Answer Questions. (Any Two)**   **10**
          1)   Explain concept of Sustainable development.
          2)   Impact of resource utilization on environment
          3)   State the methods of Measurement of Economic development.

Q.4   **a)**   What is economic development? Explain its approaches.   **10**
      b)   **Short Answer Questions. (Any Two)**   **10**
          1)   Describe E-mail shopping.
          2)   Explain bases of agriculture regionalization.
          3)   Importance of retail trades

Q.5   **a)**   Explain determinants of Agriculture.   **10**
      b)   **Short Answer Questions. (Any Two)**   **10**
          1)   Concept of Agricultural region
          2)   What is Wholesale trade?
          3)   Explain Multi Nuclei theory.

Seat No.	

Ph.D. Course Work Examination March-2021
Geography (Paper – III)
RECENT TRENDS IN POPULATION GEOGRAPHY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
           2) Figures to the right indicate full marks.

Q.1 **a)** Explain the relationship of recent population studies with sciences and social sciences.   **10**
     b) **Short answers questions. (Any Two)**   **10**
        1) Maternal mortality rate
        2) Crude Death
        3) Longevity of life

Q.2 **a)** Describe the data sources of the population.   **10**
     b) **Short answers questions. (Any Two)**   **10**
        1) Primary and secondary sex ratio
        2) Infant mortality rate
        3) Fertility ratio

Q.3 **a)** Discuss on Malthusian population theory.   **10**
     b) **Short answers questions. (Any Two)**   **10**
        1) Economic composition
        2) Population growth rate in north India
        3) Urbanization

Q.4 **a)** Write the details on optimum population theory.   **10**
     b) **Short answers questions. (Any Two)**   **10**
        1) Rural to Urban Migration
        2) Significance of population study
        3) Population status in south India

Q.5 **a)** Explain the population opportunities and policies in India.   **10**
     b) **Short answers questions. (Any Two)**   **10**
        1) Advantage of demographic transition theory
        2) Resource management and population growth
        3) Population is the strength of India

Seat No.	

Ph.D. Course Work Examination March-2021
Computer Science (Paper – III)
ARTIFICIAL INTELLIGENCE (New)

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
           2) Figures to the right indicate full marks.

Q.1 **a)** Define the state space search? Explain the monkey and bananas problem with appropriate state space.   **10**

     b) **Short Answer Questions. (Any Two)**   **10**
       1) What are the types of AI?
       2) Explain the good heuristic function for Blocks world.
       3) Describe the Connectionist Models in detail.

Q.2 **a)** Describe how the branch and bound technique could be used to find shortest solution to a water jug problem.   **10**

     b) **Short Answer Questions. (Any Two)**   **10**
       1) What are the different domains/Subsets of AI?
       2) Consider the travelling salesman problem analyze with respect to seven problem characteristics.
       3) Explain fuzzy logic system.

Q.3 **a)** Define Reasoning? Explain in detail the four factor influence to decide a better kind of reasoning?   **10**

     b) **Short Answer Questions. (Any Two)**   **10**
       1) Which programming language is used for AI? Why?
       2) Differentiate between BFS and DFS.
       3) State and discuss in detail process of explanation and knowledge acquisition as a part of Expert system.

Q.4 **a)** What is predicate logic? Give a suitable example and explain in detail.   **10**
     b) **Short Answer Questions. (Any Two)**   **10**
       1) What is the intelligent agent in AI, and where are they used?
       2) State and explain the Hill Climbing algorithm.
       3) What is Production System? Discuss the different types of rules used in Production System.

Q.5 **a)** Trace the constraint satisfaction procedure solving the following cryptarithmetic problem: **10**

         BREAK
      + SIGNAL

         DANGER

     b) **Short Answer Questions. (Any Two)**   **10**
       1) Give some real-world applications of AI.
       2) Explain the steps in natural language processing.
       3) Differentiate between Top-Down versus Bottom-Up Parsing.

Seat No.	

Ph.D. Course Work Examination March-2021
Statistics (Paper – III)
INDUSTRIAL STATISTICS
(ADVANCED DEVELOPMENT IN STATISTICS)

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.

Q.1 **a)** Explain control chart for variables used in process control.   **10**
       b) **Short answer type / short note (Any Two)**   **10**
           1) Write down scope of statistical quality control.
           2) Illustrate with example Assignable and Chance causes of variation.
           3) Differentiate: Variable and Attribute control chart.

Q.2 **a)** Explain: CUSUM chart and V-Mask technique.   **10**
       b) **Short answer type / short note (Any Two)**   **10**
           1) Write a note on OC Curve.
           2) Explain ARL control chart.
           3) Discuss moving average method is production process.

Q.3 **a)** Explain process capability ratio: Cp, Cpk, Cpm in detail.   **10**
       b) **Short answer type / short note (Any Two)**   **10**
           1) Explain: off-centred and centred process capability ratio.
           2) Discuss nonparametric approach for process capability ratio.
           3) Explain significance of Beta content and beta expectation in process capability.

Q.4 **a)** What is Acceptance sampling? Explain various acceptance sampling plans?   **10**
       b) **Short answer type / short note (Any Two)**   **10**
           1) Give the advantages of sampling inspection over 100% inspection.
           2) Explain item by item sequential sampling plan.
           3) Write down classification and general properties of sampling inspection plan.

Q.5 **a)** Explain Continuous sampling plans. Illustrate with suitable example.   **10**
       b) **Short answer type / short note (Any Two)**   **10**
           1) Define AOQL. Derive AOQL for CSP-1.
           2) Discuss operations of MLP's and Wald-Wolfowitz plans.
           3) Write note on MTLSTD 105D and ISI plans.

Seat No.	

Ph.D. Course Work Examination March-2021
Statistics (Paper – III)
INDUSTRIAL STATISTICS

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.

Q.1 **a)** Describe construction, operation, and the underlying statistical principle of p chart.   **10**

      b) 1) Describe types of variability.   **05**
           2) Explain phase I and phase II of control chart application.   **05**
           3) Define quality. What is the role of statistical methods in quality monitoring?   **05**

Q.2 **a)** Describe the construction and operation of tabular CUSUM chart for monitoring process mean.   **10**

      b) 1) Define OC and ARL of a control chart. Derive expressions for OC and ARL of $\bar{X}$ chart with usual assumptions.   **05**
           2) Describe the control chart based on moving averages.   **05**
           3) Derive the expression for ARL of a CV control chart.   **05**

Q.3 **a)** Define process capability index. Define index C_p with the necessary underlying assumptions. What is its interpretation?   **10**

      b) 1) State and prove the relationship between process capability index C_{pk} and the probability of nonconformance associated with it.   **05**
           2) Describe beta content tolerance interval.   **05**
           3) Describe process capability index C_{pm}.   **05**

Q.4 **a)** Describe sampling inspection plan by variables when lower specification limit is given and the standard deviation is not known.   **10**

      b) 1) Describe sequential sampling plans.   **05**
           2) Describe curtailed and semi-curtailed sampling plans.   **05**
           3) Explain the terms producer's risk and lot tolerance percentage defective.   **05**

Q.5 **a)** Describe MTL STD 105D and Wald-Wolfowitz sampling plans.   **10**
      b) 1) Describe CSP-1.   **05**
           2) Describe product control.   **05**
           3) Obtain ASN and ATI functions of double sampling plan by attributes.   **05**

Seat
No.

Ph.D. Course Work Examination March-2021
Microbiology (Paper – III)
ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
           2) All questions carry equal marks.

Q.1	**a)**	Discuss in detail Biological treatment - aerobic versus anaerobic treatments.	**10**
	b)	**Write short notes on (Any Two)**	**10**
		1) Activated sludge process	
		2) Biopesticides and their applications in Agriculture	
		3) Microbial life at low temperature	
Q.2	**a)**	Write in brief epidemiology of plant diseases and Bio control of soil borne plant pathogens.	**10**
	b)	**Write short notes on (Any Two)**	**10**
		1) Characterization of waste generated by Dairy Industry	
		2) In situ and Ex situ Bioremediation	
		3) Molecular biotechnological techniques used in Bioremediation	
Q.3	**a)**	Write in detail characterization and treatment of waste generated by Textile industry.	**10**
	b)	**Write short notes on (Any Two)**	**10**
		1) Microbiology of Hot and Acid springs	
		2) Trickling filter	
		3) Applications of Biofertilizers	
Q.4	**a)**	Discuss in detail Primary, Secondary and Tertiary treatments for Sewage and Industrial wastes.	**10**
	b)	**Write short notes on (Any Two)**	**10**
		1) Microbial life in Sea and Salt lakes	
		2) Phosphate solubilizers	
		3) Economics of waste treatment	
Q.5	**a)**	Write an easy on Microorganism in waste treatment technology.	**10**
	b)	**Write short notes on (Any Two)**	**10**
		1) Enumeration and identification of Methanogens	
		2) Microbiology under deep sea	
		3) Principals and techniques for isolation of Methanogens	

Seat No.	

Ph.D. Course Work Examination March-2021
Botany (Paper – III)
ADVANCED DEVELOPMENT IN BOTANY : PLANT PHYSIOLOGY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
             2) All questions carry equal marks.

Q.1 **a)** Express the methods of expressing the concentration of solution Percentage.   **10**

     b) **Answer the following questions in short (Any Two)**   **10**
1) Explain nature of enzyme.
2) Write a note on "nif" genes.
3) Define vernalization.

Q.2 **a)** What is stress physiology? Add a note on effect of air pollutants CO_2 and O_3.   **10**

     b) **Answer the following questions in short (Any Two)**   **10**
1) Write a note on the effect of thermal stress on plant metabolism.
2) Describe factors affecting enzyme activity.
3) Difference between solution and suspension.

Q.3 **a)** Define photoperiodism. Explain in brief florigen concept.   **10**
     b) **Answer the following questions in short (Any Two)**   **10**
1) Describe characteristics of Phenols and Alkaloids.
2) Explain colloidal system.
3) Describe the effect of light break on flowering.

Q.4 **a)** What are secondary metabolites? Explain the mechanism of Phenyl propanoids.   **10**

     b) **Answer the following questions in short (Any Two)**   **10**
1) Define molar solution and molal solution.
2) Describe nitrogen metabolism in relation to photosynthesis.
3) Note on mode of action of enzyme.

Q.5 **a)** Define enzymes. Add a note on structure of enzyme.   **10**
     b) **Answer the following questions in short (Any Two)**   **10**
1) Define molarity with example.
2) Effect of ROS on metabolism.
3) Explain mechanism of nitrate uptake.

Seat No.

Set **P**

Ph.D. Course Work Examination March-2021
Chemistry (Paper – III)
MODERN TOPIC IN ORGANIC CHEMISTRY

Day & Date: Wednesday, 24-03-2021   Max. Marks: 100
Time: 11.00 AM to 02.00 PM

Instructions: 1) All questions are compulsory.
                        2) Figures to the right indicate full marks.

Q.1 **a)** What are complex metal hydrides? Give applications of LDA, Gilamann Reagent and $NaBH_4$. **10**
 b) **Attempt any two of the following.** **10**
   1) Explain mechanism of Heck reaction and give its synthetic applications.
   2) What are phase transfer catalysts? Mention any two examples of them and give synthetic applications of phase transfer catalyst.
   3) Explain mechanism of Suzuki coupling and give its synthetic applications.

Q.2 **a)** What is Retrosynthetic analysis and Retro synthesis? Define target molecule and synthon. Write steps involved in Retro synthesis and give synthesis of 6-aminoquinoline. **10**
 b) **Attempt any two of the following.** **10**
   1) What are organometallic compounds? Give synthetic applications of organo-Ni compounds.
   2) What are organoboranes ? Give their synthetic applications.
   3) What are cardiovascular drugs? Write synthesis and application of any one cardiovascular drug.

Q.3 **a)** What are ionic liquids? Give examples of anionic and cationic ILs, mention their methods of synthesis and give their synthetic applications. **10**
 b) **Attempt any two of the following.** **10**
   1) Give synthetic applications of microwave and ultrasonic methods in organic synthesis.
   2) What are anti AIDS drugs? Give synthesis of one anti AIDS drug and explain its mode of action.
   3) What are antibiotics? Give their classification and write synthesis of any one antibiotic.

Q.4 **a)** Define the term synthetic equivalents, Write steps involved in Retro synthesis and give synthesis of indole 3- acetic acid and Ibuprofen. **10**
 b) **Attempt any two of the following** **10**
   1) Write a note on use of oxone and hypervalent iodine reagents in organic synthesis.
   2) Give Synthesis and applications antidiabetics drug.
   3) Write a note on olefin oxidation.

Q.5 **a)** Give two different reactions involving formation of new C-C bond and elaborate with respect to their recent advancements in catalysis and reaction conditions employed for synthesis. **10**
 b) **Attempt any two of the following.** **10**
   1) Write a note on electro- organic synthesis.
   2) Give synthetic applications of organometallic compounds of Co and Se.
   3) Write a note on Alkene and Alkyne Metathesis.