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Set **P**

M.Phil/Ph.D. Course Work Examination October-2021
MARATHI (Paper – III) (New) / (Paper – IV) (Old)
मध्ययुगीन मराठी साहित्य आणि संशोधन

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

सूचना: सर्व प्रश्न आवश्यक आहे.

- प्र. 1 अ) धर्म, पंथ, संप्रदाय आणि साहित्य यांच्यातील अनुबंध स्पष्ट करा. **10**
 ब) खालीलपैकी कोणतेही दोन लघुत्तरी प्रश्न सोडवा. **10**
 1) 'यादव काळात मराठी वाङ्मयाचा विस्तार झाला' हे विधान स्पष्ट करा.
 2) संत तुकारामांच्या अभंगातील लोकतत्त्वे उलगडून दाखवा.
 3) आख्यानकाव्याचे स्वरूप-विशेष सांगा.
- प्र.2 अ) बखरीची प्रेरणा सांगून स्वरूप विशेष सांगा. **10**
 ब) खालीलपैकी कोणतेही दोन लघुत्तरी प्रश्न सोडवा. **10**
 1) प्रवचन या प्रसारमाध्यमाचे स्वरूप सांगा.
 2) शिवकालीन बखरीवर प्रकाश टाका.
 3) प्रबोधनपर शाहिरीतील बोधपरता उलगडून दाखवा.
- प्र.3 अ) पंडिती वाङ्मयाच्या भाषाशैलीचे स्वरूप सोदाहरण स्पष्ट करा. **10**
 ब) खालीलपैकी कोणतेही दोन लघुत्तरी प्रश्न सोडवा. **10**
 1) अभंग ही संकल्पना स्पष्ट करा.
 2) मुस्लिम वाङ्मयाचे मध्ययुगीन मराठी वाङ्मयातील योगदान साधार स्पष्ट करा.
 3) छ. शिवाजी महाराजांची पत्रे यावर टीप लिहा.
- प्र.4 अ) संहितानिश्चिती व कालनिर्णयात हस्तलिखिताचे महत्त्व स्पष्ट करा. **10**
 ब) खालीलपैकी कोणतेही दोन लघुत्तरी प्रश्न सोडवा. **10**
 1) मध्ययुगीन मराठीतील वीरशैव वाङ्मयाचे स्वरूप सांगा.
 2) मध्ययुगीन साहित्यनिर्मितीत पंथ वा संप्रदाय आणि त्यांचे तत्त्वज्ञान यांना कसे महत्त्व दिले आहे ते पटवून दाखवा.
 3) लावणीची वैशिष्ट्ये सोदाहरण लिहा.
- प्र.5 अ) 'साम्यधर्माचा नवा इतिहास घडविण्यात वारकरी संप्रदायाचे महत्त्वाचे योगदान आहे' या विधानाची सार्थता स्पष्ट करा. **10**
 ब) खालीलपैकी कोणतेही दोन लघुत्तरी प्रश्न सोडवा. **10**
 1) जैन वाङ्मयातील मूल्यविचार सांगा.
 2) श्लोक व लीळा या रूपबंधावर प्रकाश टाका.
 3) 'पोवाडा म्हणजे कीर्तिकाव्य' हे विधान स्पष्ट करा.

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Ph.D. Course Work Examination October-2021
Physics (Paper – III) (New) / (Paper – IV) (Old)
Advanced Development in Physics
SOLAR CELLS AND SUPER CAPACITOR

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

- Q.1** a) Explain the P-N junction semiconductor diode. How is it useful for fabrication of solar cells? How electrons and hole pairs are generated in a semiconductor. **10**
- b) **Answer any two of the following questions.** **10**
- 1) Write a note on chalcogenide solar cells.
 - 2) Write a note on recent developments in semiconductor solar cells.
 - 3) Discuss the entire solar spectrum in brief.
- Q.2** a) List the various methods for thin film deposition. Explain any one method in the contest of thin film deposition of solar cell. **10**
- b) **Answer any two of the following questions.** **10**
- 1) Write a note on a photoelectrolysis cell.
 - 2) Distinguish between abrupt and graded pn junction.
 - 3) Explain the various factors affects on the performance of solar cell.
- Q.3** a) Explain the I-V characteristics of a solar cell and define fill factor. Explain the significance of fill factor. **10**
- b) **Answer any two of the following questions.** **10**
- 1) Why silicon solar cells are more popular than any other solar cells? Explain
 - 2) How photovoltaic effect is different from photoelectric effect?
 - 3) Explain how electron-hole pairs generated when solar graduation is incident on solar cells.
- Q.4** a) Discuss different methods for the synthesis of cathodic and anodic electrode materials. Which materials are commonly used for anode electrode and cathode electrode? **10**
- b) **Answer any two of the following questions.** **10**
- 1) Explain the use of carbon materials in the development of supercapacitors.
 - 2) Explain charging-discharging characteristic of supercapacitor. How efficiency is calculated from it.
 - 3) Explain the concept of symmetric and asymmetric supercapacitor.
- Q.5** a) Explain the different characterization techniques used for the optimization of electrode properties in supercapacitors. **10**
- b) **Answer any two of the following questions.** **10**
- 1) Explain the role of electrochemical impedance spectroscopy (EIS) as a characterization technique for supercapacitors.
 - 2) Explain the advantages and disadvantages of polymer based materials and its use as an electrode material in supercapacitors.
 - 3) Explain the current research activities in the development of supercapacitor devices.

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Ph.D. Course Work Examination October-2021
Physics (Paper – III) (New) / (Paper – IV) (Old)
Advanced Development in Physics
SOLID STATE GAS SENSOR DEVICES

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

- Q.1** a) Describe gas sensing mechanism of solid electrolyte gas sensor. **10**
 b) **Answer any two of the following questions.** **10**
 1) Spillover mechanism in SnO₂ sensor
 2) Advantages of thin film sensor over pellet
 3) Reducing and Oxidising gas mechanisms
- Q.2** a) Describe gas sensing mechanism of chemoresistive sensor with suitable example. **10**
 b) **Answer any two of the following questions.** **10**
 1) Hydrothermal method for Gas sensor
 2) FET as a gas sensor
 3) Role of fuels in the combustion synthesis method
- Q.3** a) Describe growth mechanism of 1D, 2D and 3D nanostructure with suitable examples. **10**
 b) **Answer any two of the following questions.** **10**
 1) Advantages of thick film over thin film sensors
 2) Shortcomings of semiconductor gas sensors
 3) Role of Grain boundaries in electrical conduction
- Q.4** a) Designate different enactment characteristics and prerequisite of an ideal gas sensors. **10**
 b) **Answer any two of the following questions.** **10**
 1) Thermal evaporation
 2) Solid state gas sensors
 3) Chemical Vapour deposition
- Q.5** a) Explain sol-gel method of preparation of nanocrystalline ZnO gas sensor. **10**
 b) **Answer any two of the following questions.** **10**
 1) Physical and chemical adsorption
 2) Role of defects in gas sensing.
 3) Influence of Particle size on gas sensing

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**Ph.D. Course Work Examination October-2021
Geography (Paper – III) (New) / (Paper – IV) (Old)
RECENT TRENDS IN POPULATION GEOGRAPHY**

Day & Date: Thursday, 14-10-2021
Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

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| Q.1 | a) What are current trends in population growth of India? | 10 |
| | b) Write short notes (Any Two)
1) Population Policies in India
2) Population Projections
3) Methods of measuring fertility | 10 |
| Q.2 | a) Describe various approaches to study the population Geography. | 10 |
| | b) Write short notes (Any Two)
1) Sources of population data
2) Types of densities
3) Optimum Population | 10 |
| Q.3 | a) Critically examine the Malthusian theory of population growth. | 10 |
| | b) Write short notes (Any Two)
1) Stages of Demographic transition
2) Significance of population study
3) Occupational Structure | 10 |
| Q.4 | a) Describe the factors affecting mortality and fertility in developed countries. | 10 |
| | b) Write short notes (Any Two)
1) Types of sex Ratio
2) Urbanization in India
3) World population explosion | 10 |
| Q.5 | a) Describe the causes and types of migration in details. | 10 |
| | b) Write short notes (Any Two)
1) Age composition
2) High Density regions in India
3) Population problems in India | 10 |

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Ph.D. Course Work Examination October-2021
Economics (Paper – IV)
ECONOMICS OF AGRICULTURE

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

- Q.1** a) Explain the Fei-Ranis Model of a dual economy. **10**
 b) **Answer in short of any two of the following questions.** **10**
 1) Law of Diminishing Returns in Agriculture
 2) Irrigation Policy
 3) Agri-exports
- Q.2** a) Describe graphically the theory of Input-output relationship in the context of agriculture. **10**
 b) **Answer in short of any two of the following questions.** **10**
 1) Cooperative Farming
 2) Principles of rural credit
 3) Agriculture Diversification
- Q.3** a) What is Corporate Farming? Describe its relevance for Indian agriculture. **10**
 b) **Answer in short of any two of the following questions.** **10**
 1) AoA
 2) Role of State in agriculture development
 3) Boserup Model
- Q.4** a) Briefly review the role of World Trade Organisation (WTO) in agriculture development. **10**
 b) **Answer in short of any two of the following questions.** **10**
 1) Primary Agriculture Cooperative Credit Societies (PACCS)
 2) Land degradation in agriculture
 3) Agriculture Technology
- Q.5** a) Describe the various factors contributing for low productivity in Indian agriculture. **10**
 b) **Answer in short of any two of the following questions.** **10**
 1) Agriculture & Social Justice
 2) Shifts in Production Function
 3) Watershed Development in India

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Ph.D. Course Work Examination October-2021
Commerce & Management (Paper – IV)
ADVANCED DEVELOPMENT IN MARKETING MANAGEMENT

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

- Q.1** a) What is Marketing Research? Explain the scope and importance of marketing research. 10
- b) **Write short answers. (Any Two)** 10
- 1) Explain the methods of sales analysis.
 - 2) Describe the term sales forecasting.
 - 3) Explain the concept of database marketing.
- Q.2** a) Define the term product research. Explain the process of New Product Development in detail. 10
- b) **Write short answers. (Any Two)** 10
- 1) Explain the need for new product.
 - 2) Describe the electronic test market in detail.
 - 3) Elucidate the new global strategy for marketing.
- Q.3** a) Explain the pricing research in detail. 10
- b) **Write short answers. (Any Two)** 10
- 1) Explain the market segmentation and its importance.
 - 2) Describe the tools of social marketing.
 - 3) Explain the impact of globalization on marketing strategy in India.
- Q.4** a) Explain the media research and audience measurement. 10
- b) **Write short answers. (Any Two)** 10
- 1) Explain meaning and concept of copy testing measures.
 - 2) Describe the ethics in social marketing.
 - 3) Explain the challenges before global marketing manager.
- Q.5** a) Explain importance and measurement of consumer attitude. 10
- b) **Write short answers. (Any Two)** 10
- 1) What is Multidimensional Scaling?
 - 2) Describe the SERVQUAL technique.
 - 3) Explain the Social Responsibility and Marketing Ethics.

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**Ph.D. Course Work Examination October-2021
Commerce & Management (Paper – IV)**

ADVANCED DEVELOPMENT IN HUMAN RESOURCE MANAGEMENT

Day & Date: Thursday, 14-10-2021
Time: 11.00 AM to 02.00 PM

Max. Marks: 100

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

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| Q.1 | <p>a) Differentiate Human Resource Management & Personnel Management and explain the future of HRM. 10</p> <p>b) Write short answers. (Any Two) 10</p> <p>1) Explain the functions of HRM.</p> <p>2) Describe the concept of Human Resource Development.</p> <p>3) Explain the different perspectives of HRM.</p> |
| Q.2 | <p>a) Define Human Resource Planning. Explain the process of Human Resource Planning in detail. 10</p> <p>b) Write short answers. (Any Two) 10</p> <p>1) Explain the need of human resource planning</p> <p>2) Describe the benefits of human resource planning.</p> <p>3) Elucidate the components of manpower planning.</p> |
| Q.3 | <p>a) Explain the uses and techniques of job analysis in detail. 10</p> <p>b) Write short answers. (Any Two) 10</p> <p>1) Explain the job specification and its importance.</p> <p>2) Describe the advantages of job evaluation.</p> <p>3) Explain the uses of job description.</p> |
| Q.4 | <p>a) Explain the sources and methods of recruitment in detail. 10</p> <p>b) Write short answers. (Any Two) 10</p> <p>1) Explain meaning and concept of the application blank.</p> <p>2) Describe the issue of work life balance.</p> <p>3) Explain the ethnocentric strategy in international HRM.</p> |
| Q.5 | <p>a) Explain process and methods of training in detail. 10</p> <p>b) Write short answers. (Any Two) 10</p> <p>1) What is Nishkam Karma?</p> <p>2) Describe the components of management development program.</p> <p>3) Explain the methods of performance appraisal.</p> |

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Ph.D. Course Work Examination October-2021
Mechanical Engineering (Paper – III) (New) / (Paper – IV) (Old)
ADVANCED DEVELOPMENTS IN INDUSTRIAL & PRODUCTION
ENGINEERING

Day & Date: Thursday, 14-10-2021
 Time: 11.00 AM to 02.00 PM

Max. Marks: 100

Instructions: All questions are compulsory.

- Q.1 a)** Given the data 63, 64, 66, 67, 67, 69, 71, 72 find the forecast for the ninth period using simple exponential smoothing? Use $\alpha = 0.3$ and initial forecast using simple average. Is it a good forecast? Why or why not? **10**

- b) Solve Any Two **10****
- 1) Given the data 92, 93, 92, 91, 93, 94, 92 find the forecast for the eighth period using simple average, weighted average (weight of 1 for the first four periods and 2 for the remaining three), 3 period moving average.
 - 2) What are the implications of using small α ?
 - 3) Write a short note on “ERP”.

- Q.2 a)** A computer centre has four expert programmers and needs to develop four application programmes. The head of the computer centre, estimates the computer time (in minutes) required by the respective experts to develop the application programmes as follows: **10**

	Programmes				
		A	B	C	D
Programmer	1	120	100	80	90
	2	80	90	110	70
	3	110	140	120	100
	4	90	90	80	90

Find the assignment pattern that minimizes the time required to develop the application programmes.

- b) Write Short Notes (Any Two) **10****
- 1) Value Analysis
 - 2) Material Required Planning (MRP)
 - 3) Just in time (JIT)

- Q.3 a)** How to measure performance of a supply chain? What will be your strategy to improve performance of supply chain by using Information technology tool? **10**

- b) Solve Any Two **10****
- 1) Explain ABC Analysis and its Advantages.
 - 2) Explain the different factors to be considered before preparation of supply chain model.
 - 3) Value of a Product is needed to be increased. What will be your action plan for the same?

- Q.4 a)** ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units. Cost to place one order is Rs. 1,200. Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ. No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory. **10**

- b) Solve Any Two** **10**
- 1) In what conditions. Process Layout is preferred? Add suitable example for justification.
 - 2) A Product is having seasonal demand. In winter season demand is maximum, in summer season demand is minimum and in rainy season demand is average. How you will plan the manufacturing schedule based on regular constraints.
 - 3) Explain need of discount models and its application.

- Q.5 a)** There are five jobs (namely 1,2,3,4 and 5), each of which must go through machines A, B and C in the order ABC. Processing Time (in hours) are given below. Find the sequence that minimizes the total elapsed lime. **10**
 Also Find Idle time of Each Machine

Job	1	2	3	4	5
Machine A	5	7	6	9	5
Machine B	2	1	4	5	3
Machine C	2	1	4	5	3

- b) Solve Any Two** **10**
- 1) Explain application of GANT Chart with suitable example.
 - 2) What are different principles of lean manufacturing?
 - 3) Based on what problems, KANBAN system is applicable?