

G 4104

(Pages : 2)

Reg. No.....

Name.....

**Ph.D. COURSE WORK EXAMINATION IN MANAGEMENT STUDIES
JULY 2023**

Course II—THEORY AND CONCEPT—MANAGEMENT STUDIES

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Section A

*Answer any **ten** of the following questions.*

Each question carries 4 marks.

1. What are the steps that make up the quality approach according to Deming ?
2. What is a JIT system ?
3. Describe the Static Theory of Capital Structure.
4. Compare a sticky dividend policy with a residual dividend policy.
5. Define the concepts of internal and external equity.
6. Identify a transformational leader. He or she may be a politician, a business leader, or a leader of a non-profit organization. What is unique about this person ?
7. Many employers have a policy stating that all salary information is strictly confidential. Do you agree with these policies ? Why or why not ?
8. Before making a decision to enter foreign markets, the firm must weigh several risks. List these risks and discuss briefly each.
9. Retailers are facing increasing competition from other manufacturer-to-consumer distribution channels. A retailer must develop a product-differentiation strategy. Several authors suggest seven product-differentiation strategies. List and briefly explain them.
10. Define utilization and give a service process example of it.
11. Briefly discuss any four of the six dominant factors in locating manufacturing facilities discussed.
12. Why is identifying which path is the critical path important in a project management ?

(10 × 4 = 40 marks)

Turn over

Section B

*Answer any **one** of the following questions.*

The question carries 10 marks.

13. When is it more appropriate for a global firm to use expatriate management rather than local national management ? How can a firm's screening process ensure that the best employee is chosen for an expatriate management position ?
14. What is the difference between a small business and an entrepreneurial venture ? Discuss some of the key characteristics of entrepreneurs.

(1 × 10 = 10 marks)

Ph.D. COURSE WORK EXAMINATION IN MATHEMATICS, JULY 2023**Course II—THEORY AND CONCEPT—MATHEMATICS**

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

*Answer any ten of the following questions.
Each question carries 4 marks.*

1. Prove that the set of all rational numbers is countable.

2. Show that the subset X of \mathbb{R}^3 defined by :

$$X = \{(x_1, x_2, x_3) : 0 \leq x_i < 1 \text{ for } i = 1, 2, 3\} \text{ cardinal } c.$$

3. Prove that all metric spaces are T_4 .

4. Find the radius of converge of the following :

$$(i) \quad x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

$$(ii) \quad 1 + x + 2!x^2 + 3!x^3 + \dots$$

5. Find the Laurent's expansion of :

$$f(z) = \frac{7z - 2}{(z+1)z(z-2)}.$$

6. State and prove fundamental theorem of algebra.

7. Let V be a vector space over the field F . Prove that the intersection of any collection of subspaces of V is a subspace of V .8. Let T be the linear operator on \mathbb{R}^3 defined by :

$$T(x_1, x_2, x_3) = (3x_1 + x_3, -2x_1 + x_2, -x_1 + 2x_2 + 4x_3).$$

(i) What is the matrix of T in the standard ordered basis for \mathbb{R}^3 ?(ii) What is the matrix of T in the ordered basis $\{\alpha_1, \alpha_2, \alpha_3\}$ where $\alpha_1 = (1, 0, 1)$, $\alpha_2 = (-1, 2, 1)$,

$$\alpha_3 = (2, 1, 1) ?$$

Turn over

9. Prove that, if f is a homomorphism of a group G into a group G^1 with Kernel K then K is a normal subgroup.
10. Solve $(D^2+1)y = \frac{1}{1+\sin x}$.
11. Solve : $(x^2 - y^2)dx - xydy = 0$
12. Solve the equation $xy \frac{\partial^2 z}{\partial x \partial y} - x \frac{\partial z}{\partial x} = y^2$.

(10 × 4 = 40 marks)

Part B

*Answer any one question from the following.
The question carries 10 marks.*

13. Let c be any real number and let f and g be real-valued measurable functions defined on the same measurable set E . Then show that $f + c$, cf , $f + g$, $f - g$ and fg are measurable.
14. Let μ^* be an outer measure defined on the power set of a nonempty set X . Show that the class \mathcal{B} of all μ^* -measurable subsets is a σ -algebra. If $\bar{\mu}$ is the restriction of μ^* to \mathcal{B} , show that $\bar{\mu}$ is a complete measure on \mathcal{B} .

(1 × 10 = 10 marks)

G 4106

Reg. No.....

Name.....

**Ph.D. COURSE WORK EXAMINATION IN PHILOSOPHY
JULY 2023**

Course II—THEORY AND CONCEPT—PHILOSOPHY
(2020 Admissions onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

*Answer any ten of the following questions.
Each question carries 4 marks.*

1. Differentiate between Being and Becoming.
2. Write a note on Axiological Problems.
3. Explain the method of deduction.
4. What is Syllogism ? Explain.
5. Write a note on Metaethics.
6. What is the problem of free will ? Explain in detail.
7. Write a note on the Plato's Theory of Forms.
8. What is Metaphysics ? Explain.
9. Write a note on Buddhist Sunyavada.
10. What is the picture theory of meaning in philosophy ? Explain.
11. Discuss about Derrida's Critique of Logocentrism.
12. What are the key concepts of Kristeva ? Explain.

(10 × 4 = 40 marks)

Part B

*Answer any one question from the following.
The question carries 10 marks.*

13. What is Euthanasia ? What are the types Euthanasia ? Explain in detail the ethical issues involved in Euthanasia.
14. What is the significance of the relation between sense and reference, according to Frege ? Explain.

(1 × 10 = 10 marks)

G 4107

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN PHYSICS, JULY 2023

Course II—THEORY AND CONCEPT—PHYSICS

(2020 Admissions onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten questions.

Each question carries 4 marks.

1. Explain quantum theory of paramagnetism.
2. Discuss the Stokes shift in optical transitions of semiconductors.
3. Write short notes on classification of elementary particles.
4. Obtain the Klein Gordon equation. Discuss its significance.
5. Explain the propagation of electromagnetic wave through non-linear media.
6. What is the perfect cosmological principle ? Discuss its significance.
7. Illustrate the electromagnetic field tensor.
8. What is Fermi Dirac distribution function ?
9. What are charm, truth and beauty quantum numbers ? Explain in detail.
10. Obtain the Boltzman transport equation.
11. What are space time diagrams ?
12. Explain Friedman Universe model.

(10 × 4 = 40 marks)

Part B

Answer any one questions.

The question carries 10 marks.

13. Discuss the second and third order nonlinear phenomena
14. Write detailed note on coherent anti Stokes Raman scattering.

(1 × 10 = 10 marks)

G 4108

Reg. No.....

Name.....

**Ph.D. COURSE WORK EXAMINATION IN POLITICAL SCIENCE
JULY 2023**

Course II—THEORY AND CONCEPT— POLITICAL SCIENCE

(2020 Admissions onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Write a note on post-positivism.
2. Explain the Postulates of idealism.
3. Discuss the growth and evolution of liberalism.
4. Is Marxism relevant in contemporary times ? Give reasons.
5. What is postmodernism structuralism theory? Explain.
6. Discuss Feminist theory of the State.
7. Comment on Neo-liberal perspective of State.
8. Explain the concept of Multiculturalism as the contemporary perspectives on politics and society.
9. Write a note on the concept of Underdevelopment.
10. Explain the role of civil society in modern period.
11. Explain in detail the features of New Social Movements.
12. What is the political economy of global governance ? Explain.

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. Write a detailed note on various theories of globalisation.
14. Discuss about Green theories.

(1 × 10 = 10 marks)

G 4109

(Pages : 2)

Name.....

Reg. No.....

Ph.D. COURSE WORK EXAMINATION IN SANSKRIT, JULY 2023

Course II—THEORY AND CONCEPT—SANSKRIT

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

*Answers may be written either in Sanskrit or in English.
In writing Sanskrit, Devanagari script should be used.*

Part A

*Answer any ten of the following questions.
Each question carries 4 marks.*

उत्तराणि खण्डिकारूपेण लिखत :

1. वेदाङ्गेषु व्याकरणम् ।
2. महाकाव्यानि ।
3. भावविकाराः ।
4. वास्तुविद्या ।
5. नवभारतम् ।
6. पञ्चतन्त्रम् ।
7. वराहमिहिरः ।
8. आदिकाव्यम् ।
9. दशोपनिषत् ।
10. Nature of Manuscripts.
11. Word-Processing.
12. A.R. Rajarajavarma.

(10 × 4 = 40 marks)

Turn over

Part B

Answer any one of the following question.

The question carries 10 marks.

13. कालिदासकृतनाटकान्यधिकृत्य उपन्यस्यत ।

14. नास्तिकदर्शनानि—विवृणुत ।

(1 × 10 = 10 marks)

G 4110

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN SOCIAL WORK, JULY 2023

Course II—THEORY AND CONCEPT – SOCIAL WORK

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Explain in detail Cognitive behaviour model.
2. Write a note on micro and mezzo practice models in social work.
3. Define empowerment and write a note on empowerment model.
4. Discuss the impact of displacement and forced migration.
5. Write a note on the issue of global warming and climate change.
6. What are the goals of international social work ?
7. Briefly describe the membership criteria for ICSW.
8. Explain the different strategies of international social work practice.
9. Write a note on United Nations Millennium Development Goals and targets.
10. Why is Multiculturalism important in social work ?
11. What are the challenges of field work and research in international social work ?
12. What are the specific aims of the Global Standards for social work education and training ?

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. Explain in detail the various perspectives of international social work.
14. How would do you deal with the following issues as a professional social worker ?
 - (i) Children separated from their families.
 - (ii) Poverty.
 - (iii) Trafficking in persons.

(1 × 10 = 10 marks)

G 4111

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN SOCIOLOGY, JULY 2023

Course II—THEORY AND CONCEPT – SOCIOLOGY

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

*Answer any **ten** of the following questions.*

Each question carries 4 marks.

1. Discuss Sociology as a Scientific discipline.
2. Bring out the practical use of Sociological knowledge.
3. How does Sociology influence social policy ?
4. What is inter subjectivity according to Edmund Husserl ?
5. Discuss structuralism in the context of social system.
6. State the main elements of Deconstruction by Jacques Derrida.
7. What is Duality of Structure according to Antony Giddens ?
8. Briefly discuss functionalist perspective of gender roles and gender inequality.
9. Critically evaluate the progress and challenges in the present education system.
10. High light the purposes of Schooling according to functionalist.
11. Discuss the impact of ICT on society and culture.
12. Briefly explain Ravenstein's laws of migration.

(10 × 4 = 40 marks)

Part B

*Answer any **one** of the following questions*

The question carries 10 marks.

13. Critically evaluate Michel Foucault's theory of Power and Knowledge.
14. Discuss sex and gender debate in feminist theory.

(1 × 10 = 10 marks)

G 4112

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN ZOOLOGY, JULY 2023

Course II—THEORY AND CONCEPT – ZOOLOGY

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Write a note on conservation of diversity and endangered species.
2. What are the main sources of genetic diversity ? Explain.
3. What are the characteristics of EIA ? Explain.
4. Explain about the assessment of biodiversity in different types of ecosystems.
5. What are the ICMR guidelines for experiments involving animals and humans ?
6. What is the principle and applications of Centrifugation ?
7. List and explain the factors which may affect the effectiveness of tissue fixation.
8. What is X-ray crystallography ? Explain.
9. What is microtomy in histology ? Explain.
10. Write a note on Fluorescence microscopy.
11. What are the applications of Electron Microscopy ?
12. Explain PCR and its principle.

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. Explain in detail the modern tools of Taxonomy.
14. Explain in detail about the various Blotting techniques.

(1 × 10 = 10 marks)

Ph.D. COURSE WORK EXAMINATION IN STATISTICS, JULY 2023**Course II—THEORY AND CONCEPT – STATISTICS**

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A*Answer any ten questions from the following.**Each question carries 4 marks.*

1. What do you mean by discrete random variable ? Define the probability mass function of a discrete random variable X .
2. Define probability space.
3. If X is normally distributed with $\mu = 0$ and $\sigma = 1$, the find :

(i) $P(0 \leq \sin \pi x \leq 0.2)$; and

(ii) $P(0.25 \leq \sin \pi x \leq 0.25)$.

4. What is meant by rank of a matrix ? Find the rank of
$$\begin{pmatrix} 1 & 0 & 2 & 1 \\ 1 & 1 & 2 & 0 \\ 1 & -1 & 2 & 2 \\ 1 & 1 & 2 & 0 \end{pmatrix}.$$

5. Write short notes on (i) Unbiasedness ; and (ii) Efficiency of estimators.
6. Based on a random sample of size ' n ' obtain the confidence interval of the mean and variance of a Normal distribution.
7. Define Poisson distribution. Find the maximum likelihood estimator of the parameter of Poisson population.

8. Describe the terms :
- (i) Type I error ;
 - (ii) Type II error ; and
 - (iii) Most powerful test.
9. Define canonical correlation and canonical variables. Explain two properties of canonical variables.
10. Define bivariate Normal distribution of random variables X and Y and derive the marginal density function of X.
11. A probability density function is given by $f(x) = k(2-x)$ for the range $0 \leq x \leq 2$. Find k and then determine the arithmetic mean, median and the variance.
12. State Rao-Blackwell theorem.

(10 × 4 = 40 marks)

Part B

*Answer any one questions from the following.
The question carries 10 marks.*

13. (a) State Central limit theorem and give its applications.
- (b) Using Central limit theorem to the sum of random variables with probability mass :

$$\frac{e^{-1}}{x!}, x = 0, 1, 2, \dots, \text{ prove that } \lim_{n \rightarrow \infty} \sum_{x=0}^n \frac{e^{-n} \cdot n^x}{x!} = \frac{1}{2}.$$

14. State and prove Rao-Cramer inequality.

(1 × 10 = 10 marks)

G 4114

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course IV—RESEARCH AND PUBLICATION ETHICS

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

*Answer any **four** questions from the following.*

Each question carries 5 marks.

1. What is salami slicing ?
2. What do you mean by research integrity ?
3. What is Plagiarism ?
4. Discuss about h-index and g-index.
5. What do you mean by misinterpretation of data ?
6. Explain about publication misconduct.
7. Which are the branches of philosophy ?
8. Write a note on Plagiarism.
9. What is ethics in respect to science and research ?
10. What is the nature of moral judgement ?

(4 × 5 = 20 marks)

Part B

*Answer any **two** questions from the following.*

Each question carries 15 marks.

11. Explain in detail about open access publishing.
12. What is scientific misconduct ? Explain different types of plagiarism.
13. Write short notes on duplicate publications, overlapping publication and salami slicing.
14. Write about predatory publishers and journals.

(2 × 15 = 30 marks)

Ph.D. COURSE WORK EXAMINATION, JULY 2023**Course I—RESEARCH METHODOLOGY**

(II-Common to the Stream : Social Sciences, Management, Commerce, Law and Behavioural Sciences)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten questions from the following.

Each question carries 4 marks.

1. Explain mixed method approach with example.
2. What is research design ? Explain any two research designs.
3. What is epistemology ?
4. What are the sources of research problem ?
5. What are the different types of variables.
6. Explain the concept of measurement in research. What are the levels of measurement ?
7. What are the steps in construction of arbitrary scale ?
8. What are the ethical considerations in Social research ?
9. Explain MLA style.
10. Explain the features of a good report.
11. Explain the importance of statistics in Social Research
12. Elaborate attitude scales as methods of data collection.

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. What are the procedures of hypothesis testing ?
14. Explain briefly the different data collection methods used in qualitative research with its merits and demerits.

(1 × 10 = 10 marks)

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course I—RESEARCH METHODOLOGY

[III - Common to the Stream : Languages]

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Define and describe the merging paradigm in research.
2. What is the basic principle of logical positivism ? Explain.
3. What are limitations and delimitations of research ?
4. What are the steps to consider in selecting a research topic ?
5. What is hypothesis in linguistic research ? Explain.
6. In what way Encyclopaedias can be used as a material for research ? Explain.
7. In what way discussion groups help in language research ? Explain.
8. Explain the sampling method of research.
9. Write a note on the comparative method of research.
10. Why are footnotes/endnotes important in research thesis ? Explain.
11. What are important things to be kept in mind when presenting tables and illustrations in research thesis ?
12. Explain the role of search engines in research.

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. Write a detailed note on the steps involved in the preparation of research proposal.
14. Explain in detail the various types and techniques of data collection.

(1 × 10 = 10 marks)

G 4117

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course I—RESEARCH METHODOLOGY

[I - Common to the Stream : Science, Technology and Applied Sciences and Engineering
Technology]

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. What are the criteria of good research ? Explain.
2. Write a note on reliability and validity in quantitative research and qualitative research.
3. Illustrate the steps to develop a research plan.
4. What are the major advantages and disadvantages of primary data ?
5. Differentiate between random and non-random sampling.
6. Differentiate between ISBN and ISSN.
7. Briefly describe the components of scientific report.
8. Summarize the salient provisional points in patents.
9. Explain the importance of visual aids in the presentation of a research work.
10. Write a note on the use of Internet in research.
11. Explain the different graphical representation of data.
12. Write a brief note about Bibliography and Reference.

(10 × 4 = 40 marks)

Part B

Answer any one question from the following.

The question carries 10 marks.

13. What are ethical issues involved in research and explain the role of ethical committee in the field of research ?
14. Write detailed notes on the steps involved in the preparation of research papers for journals.

(1 × 10 = 10 marks)

G 4118

(Pages : 2)

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course I—RESEARCH METHODOLOGY

(II- Common to the Stream : Social Sciences, Management, Commerce, Law and Behavioural Sciences)

(Prior to 2020 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer any twelve questions from the following
Each question carries 5 marks.*

1. What is Pragmatic Paradigm ?
2. Explain the relationship between theory and research?
3. Explain mixed method approach with example.
4. What is research design ? Explain any two research designs.
5. What is Epistemology ?
6. What are the sources of research problem ?
7. What are the different types of variables.
8. Explain the concept of measurement in research. What are the levels of measurement ?
9. What are the steps in construction of arbitrary scale ?
10. What are the ethical considerations in Social research ?
11. Explain MLA style.
12. Explain the features of a good report.
13. Explain the importance of statistics in Social Research.
14. Elaborate attitude scales as methods of data collection.
15. What is Triangulation ? Explain with examples.
16. What is Plagiarism ?

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any **two** questions from the following.
Each question carries 10 marks.*

17. Elaborate on qualitative research designs.
18. What are the procedures of hypothesis testing ?
19. Briefly explain the structure of a research report.
20. Explain briefly the different data collection methods used in qualitative research with its merits and demerits.

(2 × 10 = 20 marks)

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course I—RESEARCH METHODOLOGY

(III- Common to the Stream : Languages)

(Prior to 2020 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer any twelve of the following questions.**Each question carries 5 marks.*

1. Define and describe the merging paradigm in research.
2. What is the basic principle of logical positivism ? Explain.
3. Explain in detail the nature and types of research.
4. What are limitations and delimitations of research ?
5. What are the steps to consider in selecting a research topic ?
6. What is hypothesis in linguistic research ? Explain.
7. In what way Encyclopaedias can be used as a material for research ? Explain.
8. Explain the role of government publications in the research.
9. In what way discussion groups help in language research ? Explain.
10. Explain the sampling method of research.
11. Write a note on the comparative method of research.
12. Why are footnotes/endnotes important in research thesis ? Explain.
13. What are important things to be kept in mind when presenting tables and illustrations in research thesis ?
14. Differentiate between literary criticism and literary research.
15. Write a note on INFLIBNET.
16. Explain the role of search engines in research.

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any **two** questions from the following.*

Each question carries 10 marks.

17. What is ontology, epistemology and axiology in research ? Explain.
18. Write a detailed note on the steps involved in the preparation of research proposal.
19. Explain in detail the various types and techniques of data collection.
20. Write a detailed note on the contributions of early writers in research.

(2 × 10 = 20 marks)

G 4120

(Pages : 2)

Reg. No.....

Name.....

**Ph.D. COURSE WORK EXAMINATION IN CHEMISTRY
JULY 2023**

Course II—THEORY AND CONCEPT—CHEMISTRY (2019 Admissions Only)

INSTRUMENTAL METHODS OF ANALYSIS IN CHEMISTRY (Prior to 2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer any twelve of the following questions.

Each question carries 5 marks.

1. (a) The IR stretching vibrations of O-H and N-H are around 3500 cm^{-1} . How will you distinguish between them ?
(b) What is the limitation of Raman spectroscopy ?
2. Discuss the instrumentation of Auger electron spectroscopy.
3. What is the principle of polarized optical microscopy ?
4. (a) What is the effect of solvent polarity in chromatography ?
(b) Discuss the time-domain method for the measurement of thermal conductivity.
5. (a) What is Reversed-phase chromatography ? What are its applications ?
(b) Briefly explain the method of preparation of TLC plates.
6. (a) What are the limitations of X-ray diffraction technique ?
(b) What is static light scattering method ?
7. (a) Discuss the applications of Vapor Pressure Osmometry.
(b) What is the application of dielectric thermal analysis?
8. What is meant by volume resistivity ? How is it measured ?
9. (a) What are the different types of compressions ?
(b) What are flexural properties of materials ?

Turn over

10. What are the advantages of vibrating viscometer ?
11. (a) What is the relationship between luminescence and fluorescence ?
(b) How is optical transparency measured ?
12. (a) How will you record the IR spectrum of a gaseous molecule ?
(b) What does high effusivity mean ?
13. List out the different light scattering techniques used for material characterization.
14. Differentiate between Dynamic Mechanical Analysis and Thermo Mechanical Analysis.
15. (a) How creep relaxation is different from stress relaxation ?
(b) Discuss the uses of Interference Microscopy.
16. (a) What are the different types of electrode impedance spectroscopy ?
(b) Discuss the applications of Secondary ion mass spectrometry

(12 × 5 = 60 marks)

Part B

Answer any **two** of the following questions.

The question carries 10 marks.

17. (a) Explain the various applications of ESR spectroscopy.
(b) Explain the instrumentation and applications of thermogravimetric analysis.
18. (a) What is the difference between partition and adsorption chromatography ?
(b) Explain the various static and dynamic mechanical properties of materials.
19. (a) Explain the applications of X-ray photoelectron spectroscopy.
(b) Describe the instrumental components and applications of Membrane Osmometry.
20. (a) Make a comparative studies on the instrumentation and applications of SAXS and WAXD ?
(b) Why in some cases rheometer is required than viscometer for viscosity measurements. What is the application of rotational rheometer ?

(2 × 10 = 20 marks)

G 4121

(Pages : 2)

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course II—RECENT ADVANCES IN ECONOMIC THEORY AND POLICY

(Prior to 2020 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer any twelve of the following.
Each question carries 5 marks.*

1. Write a note on money and time in a Walrasian model.
2. Discuss the inconsistency of Walra's law with Keynesian unemployment.
3. Explain Repressed Inflation.
4. What is 'Information Asymmetry' ?
5. Write a note on 'Hidden Action Principle'.
6. Explain Sharpe's approach to the capital asset pricing model.
7. Explain Coase theorem.
8. What is 'Pigou effect' ?
9. Write a note on financial inclusion.
10. What is the new Kenesian model ?
11. What is subprime crisis ?
12. Write a note on rational expectations hypothesis.
13. What do you understand by neo-Keynesianism ?
14. Write a note on Inflation Targeting.
15. Explain 'moral hazard'.
16. What do you mean by sustainable development.

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any two questions from the following.
Each question carries 10 marks.*

17. Discuss the recent employment generation programmes in India.
18. Critically examine the financial sector reforms in India.
19. Discuss the environmental issues and global warming in the Indian context.
20. Explain the impact of financial crisis on the Indian economy.

(2 × 10 = 20 marks)

G 4122

(Pages : 2)

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN MALAYALAM, JULY 2023

Course II—ഭാഷാസാഹിത്യപഠന സിദ്ധാന്തം

(Prior to 2020 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

പന്ത്രണ്ടു ചോദ്യത്തിന് ഈരണ്ടു പുറത്തിൽ കവിയാതെ ഉത്തരമെഴുതുക.

ഓരോ ചോദ്യത്തിനും 5 മാർക്കു വീതം.

1. മലയാള ഭാഷാ സംബന്ധമായ ആദ്യ വ്യാകരണരചനയായി ലീലാതിലകത്തെ പരിഗണിക്കാമോ ? വ്യക്തമാക്കുക.
2. ആന്യവാദികൾ, കക്ഷ്യാപരം എന്നിങ്ങനെയുള്ള ഭാഷാവിശ്ലേഷണത്തിന്റെ അടിസ്ഥാന തത്വങ്ങൾ എന്തെല്ലാം ?
3. “പാട്ടിന്റെയും മണിപ്രവാളത്തിന്റെയും സംയോജനമാണ് എഴുത്തച്ഛൻ തന്റെ കൃതികളിൽ നിർവ്വഹിച്ചത്” —ഉപപാദിക്കുക.
4. ഐക്യ കേരള പ്രസ്ഥാനത്തിന്റെ രാഷ്ട്രീയവും സാംസ്കാരികവും സാമൂഹികവുമായ അടിസ്ഥാനങ്ങൾ ഏവ ?
5. സമൂഹത്തിലെ അധികാര ഘടനയെ നിർവചിക്കുന്നതിലും നിർവഹിക്കുന്നതിലും ഭാഷ വഹിക്കുന്ന പങ്കെന്ത് ?
6. വ്യത്യാസപരത്തിന് ആധാരമാക്കാവുന്ന രണ്ടു മലയാള കൃതികൾ പരിചയപ്പെടുത്തുക.
7. നവോത്ഥാനം കേരളീയ സമൂഹത്തിൽ വരുത്തിയ സാമൂഹിക സാംസ്കാരിക പരിവർത്തനങ്ങൾ വിവരിക്കുക.
8. കല കലയ്ക്കു വേണ്ടി എന്ന വാദത്തിനു പിന്നിലുള്ള സൗന്ദര്യദർശനം വിശദീകരിക്കുക.
9. കേരള സംസ്കാര ചരിത്രത്തിൽ മിഷനറിമാരുടെ പ്രവർത്തനങ്ങൾ സൃഷ്ടിച്ച പരിവർത്തനങ്ങൾ എന്തെല്ലാം ?
10. സാഹിത്യം, സമൂഹം, സൗന്ദര്യബോധം എന്നിവയെക്കുറിച്ചുള്ള പുരോഗമന സാഹിത്യ പ്രസ്ഥാനത്തിന്റെ കാഴ്ചപ്പാടുകൾ പരിശോധിക്കുക.
11. ആചാരാനുഷ്ഠാനങ്ങൾ സംസ്കാരസൂചകങ്ങളാകുന്നതെങ്ങനെ ? സോദാഹരണം വ്യക്തമാക്കുക.
12. നാടകപരമ്പരയും തിരക്കഥാപരമ്പരയും മാധ്യമ സവിശേഷതകളുടെ അടിസ്ഥാനത്തിൽ താരതമ്യം ചെയ്യുക.
13. കേരളീയ ദൃശ്യകലകളെക്കുറിച്ചുള്ള പഠനത്തിൽ അന്തർ വിജ്ഞാനീയ സമീപനത്തിനുള്ള സാധ്യത എത്ര മാത്രം ? വിശദീകരിക്കുക.
14. മലയാള ഭാഷയുടെ ഉത്പത്തി ചർച്ചയിൽ തമിഴ് ജന്യവാദങ്ങൾക്കുള്ള പ്രാധാന്യമെന്ത് ?
15. വൈജ്ഞാനിക സാഹിത്യത്തിൽ മലയാളത്തിന്റെ നില സംഗ്രഹിച്ചെഴുതുക.
16. ഭരണ ഭാഷയും കോടതി ഭാഷയും മലയാളമാക്കേണ്ടതിന്റെ ആവശ്യകത ചർച്ച ചെയ്യുക.

(12 × 5 = 60 marks)

Turn over

Part B

രണ്ടു ചോദ്യത്തിന് നന്നാലു പുറത്തിൽ കവിയാതെ ഉത്തരമെഴുതുക.

ഓരോ ചോദ്യത്തിനും 10 മാർക്കു വീതം.

17. കേരളത്തിന്റെ ചരിത്ര-സാംസ്കാരിക-സാമൂഹിക പഠനത്തിന് പ്രാചീന മധ്യകാല മണിപ്രവാള കൃതികൾ എത്രത്തോളം സഹായകമാണ് ? പരിശോധിക്കുക.
18. സ്ത്രീവാദ-പാരിസ്ഥിതിക-കിഴാള വീമർശന സമീപനങ്ങൾ പരമ്പരാഗത സാഹിത്യ സങ്കല്പത്തെ എങ്ങനെയെല്ലാം അപനിർമ്മിക്കുന്നു ? വിവരിക്കുക.
19. തക്ഷി, ബഷീർ, ഉറൂബ് എന്നിവരുടെ നോവലുകളിൽ ആവിഷ്കൃതമായിട്ടുള്ള നവോത്ഥാനാശയങ്ങൾ വിശകലനം ചെയ്യുക.
20. നവമധ്യമങ്ങളുടെ സംസ്കാര നിർമ്മിതി സമകാലിക മലയാള സാഹിത്യത്തിൽ എങ്ങനെ പ്രതിഫലിക്കുന്നു ? പരിശോധിച്ചു മൂല്യനിർണ്ണയം ചെയ്യുക.

(2 × 10 = 20 marks)

Ph.D. COURSE WORK EXAMINATION IN PHYSICS, JULY 2023

Course II { THEORY AND CONCEPT - PHYSICS (2019 Admissions only)
RECENT DEVELOPMENTS IN PHYSICS (Prior to 2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer any twelve questions.**Each question carries 5 marks.*

1. Explain quantum theory of paramagnetism.
2. Discuss the Stokes shift in optical transitions of semiconductors.
3. Write short notes on classification of elementary particles.
4. Obtain the Klein Gordon equation. Discuss its significance.
5. Briefly explain the free electron theory in 3D.
6. Explain the propagation of electromagnetic wave through nonlinear media
7. What is the perfect cosmological principle ? Discuss its significance.
8. Illustrate the electromagnetic field tensor.
9. Discuss Kronig-Penny model in detail.
10. What is Fermi Dirac distribution function ?
11. What are charm, truth and beauty quantum numbers ? Explain in detail.
12. Obtain the Boltzman transport equation.
13. What are relativistic field theories ? Give examples.
14. What are space time diagrams ?
15. Explain Friedman Universe model.
16. Derive the expression for effective mass for electrons and holes in semiconductors.

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any **two** questions.
Each question carries 10 marks.*

17. Discuss the second and third order nonlinear phenomena
18. Write detailed note on coherent anti Stokes Raman scattering.
19. Discuss the domain theory of paramagnetism.
20. Explain in detail the quark model of particle physics.

(2 × 10 = 20 marks)

G 4231

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN PSYCHOLOGY, JULY 2023

Course II—THEORY AND CONCEPT – PSYCHOLOGY

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

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

1. Allport's concept of trait.
2. Positive Psychology.
3. Resilience.
4. Concept of Health.
5. Psychoneuroimmunology.
6. Social cognition.
7. Group dynamics.
8. Limbic system.
9. Amygdale.
10. Brain stem.
11. Test validity.
12. Creativity.

(10 × 4 = 40 marks)

Part B

*Answer any **one** questions.
The question carries 10 marks.*

13. Define health behaviour. Discuss major health promoting behaviours.
14. Discuss psychological tests for special population.

(1 × 10 = 10 marks)

G 4256

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN MUSIC, JULY 2023

Course II—THEORY AND CONCEPT—MUSIC

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Describe the salient features of the musical form 'Kriti'.
2. What are the sources available on internet for research in Music.
3. Narrate the various signs and symbols used in writing Carnatic Music.
4. Sangeetha Ratnakara of Saranga deva is an important milestone in Indian music—Elucidate.
5. Explain the various classification of Musical instruments with reference to Natya Sastra of Bharata.
6. Detail the varieties of Ragamalikas.
7. Discuss the rare ragas used in compositions of Thyagaraja.
8. Explain the various types of Data available for research in Music.
9. Write a synopsis for a topic of your choice for research.
10. Explain the difference between Padavarna and Tana varna.
11. Write the lakshana of any one of the following ragas : Kharaharapriya, Thodi, Anandabhairavi.
12. What are the constraints in documenting Music Concerts.

(10 × 4 = 40 marks)

Part B

Answer any one questions.

The question carries 10 marks.

13. Explain the importance of Lakshana granthas in the development of Carnatic Music.
14. Write an essay on the important sources for carrying out research in Music.

(1 × 10 = 10 marks)

Ph.D. COURSE WORK EXAMINATION IN PHYSICS, JULY 2023

Course II { THEORY AND CONCEPT - PHYSICS (2019 Admissions only)
RECENT DEVELOPMENTS IN PHYSICS (Prior to 2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer any twelve questions.**Each question carries 5 marks.*

1. Explain quantum theory of paramagnetism.
2. Discuss the Stokes shift in optical transitions of semiconductors.
3. Write short notes on classification of elementary particles.
4. Obtain the Klein Gordon equation. Discuss its significance.
5. Briefly explain the free electron theory in 3D.
6. Explain the propagation of electromagnetic wave through nonlinear media
7. What is the perfect cosmological principle ? Discuss its significance.
8. Illustrate the electromagnetic field tensor.
9. Discuss Kronig-Penny model in detail.
10. What is Fermi Dirac distribution function ?
11. What are charm, truth and beauty quantum numbers ? Explain in detail.
12. Obtain the Boltzman transport equation.
13. What are relativistic field theories ? Give examples.
14. What are space time diagrams ?
15. Explain Friedman Universe model.
16. Derive the expression for effective mass for electrons and holes in semiconductors.

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any two questions.
Each question carries 10 marks.*

17. Discuss the second and third order nonlinear phenomena
18. Write detailed note on coherent anti Stokes Raman scattering.
19. Discuss the domain theory of paramagnetism.
20. Explain in detail the quark model of particle physics.

(2 × 10 = 20 marks)

G 4119

(Pages : 2)

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION, JULY 2023

Course I—RESEARCH METHODOLOGY

(III- Common to the Stream : Languages)

(Prior to 2020 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer any **twelve** of the following questions.*

Each question carries 5 marks.

1. Define and describe the merging paradigm in research.
2. What is the basic principle of logical positivism ? Explain.
3. Explain in detail the nature and types of research.
4. What are limitations and delimitations of research ?
5. What are the steps to consider in selecting a research topic ?
6. What is hypothesis in linguistic research ? Explain.
7. In what way Encyclopaedias can be used as a material for research ? Explain.
8. Explain the role of government publications in the research.
9. In what way discussion groups help in language research ? Explain.
10. Explain the sampling method of research.
11. Write a note on the comparative method of research.
12. Why are footnotes/endnotes important in research thesis ? Explain.
13. What are important things to be kept in mind when presenting tables and illustrations in research thesis ?
14. Differentiate between literary criticism and literary research.
15. Write a note on INFLIBNET.
16. Explain the role of search engines in research.

(12 × 5 = 60 marks)

Turn over

Part B

*Answer any **two** questions from the following.*

Each question carries 10 marks.

17. What is ontology, epistemology and axiology in research ? Explain.
18. Write a detailed note on the steps involved in the preparation of research proposal.
19. Explain in detail the various types and techniques of data collection.
20. Write a detailed note on the contributions of early writers in research.

(2 × 10 = 20 marks)

G 4256

Reg. No.....

Name.....

Ph.D. COURSE WORK EXAMINATION IN MUSIC, JULY 2023

Course II—THEORY AND CONCEPT—MUSIC

(2020 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A

Answer any ten of the following questions.

Each question carries 4 marks.

1. Describe the salient features of the musical form 'Kriti'.
2. What are the sources available on internet for research in Music.
3. Narrate the various signs and symbols used in writing Carnatic Music.
4. Sangeetha Ratnakara of Saranga deva is an important milestone in Indian music—Elucidate.
5. Explain the various classification of Musical instruments with reference to Natya Sastra of Bharata.
6. Detail the varieties of Ragamalikas.
7. Discuss the rare ragas used in compositions of Thyagaraja.
8. Explain the various types of Data available for research in Music.
9. Write a synopsis for a topic of your choice for research.
10. Explain the difference between Padavarna and Tana varna.
11. Write the lakshana of any one of the following ragas : Kharaharapriya, Thodi, Anandabhairavi.
12. What are the constraints in documenting Music Concerts.

(10 × 4 = 40 marks)

Part B

Answer any one questions.

The question carries 10 marks.

13. Explain the importance of Lakshana granthas in the development of Carnatic Music.
14. Write an essay on the important sources for carrying out research in Music.

(1 × 10 = 10 marks)