

**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- ENGLISH**

Time: 4 Hours

**PAPER : 302**

Full Marks: 80

*The figure in the right hand margin indicate marks.*

*Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

1. Write brief notes on any EIGHT of the following. [2 x 8]
- i) Who is Richard de Coverley?
  - ii) How does S leele describe his mother?
  - iii) What makes Gardener's instructive essays charming?
  - iv) Why are some people afraid of walking under with a ladder?
  - v) Bacon writes "Be angry, but sin not".- What does that mean?
  - vi) What does the elephant symbolize in Orwell's story?
  - vii) Why does Huxely describe pleasure as "curious and appalling"?
  - viii) Do you think Orwell's "Bookshop Memories" is autobiographical?
  - ix) Who is the "Super annuated Man"?
  - x) How does Lamb divide the human race into two different species?
  - xi) "A lie faces God and shrinks from men" - Explain.

**Group - B**

[16 x 4]

**Answer Any FOUR questions.**

2. Bacon's prose is enriched by his frequent use of aphorisms. Discuss with textual reference.
3. Discuss Lamb's '*The Superannuated Man*' as an autobiographical essay.
4. 'A journey should be liberating from everyday world and its concern'- Elaborate Hazlitt's idea of a journey.
5. What is the symbolic significance of Huxely's "*Heaven and Hell*"?
6. Discuss the reminiscences of George Orwell in '*Bookshop Memories*'.
7. Bring out the elements of satire and humour in Charles Lamb's "*The Two Races of Men*"?



**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- MCO**  
**PAPER : - 302**

Time: 4 Hours  
Full Marks: 80

*The figure in the right hand margin indicate marks.*

*Question No.1 is compulsory, answer any FOUR from the rest.*

1. **Answer any EIGHT of the following.** [2 x 8]
- a) What do you understand by the term "Perception"?
  - b) Define Organizational Behavior.
  - c) List down two disadvantages of group decision making.
  - d) What are the five types of needs as emphasized by Maslow's need hierarchy?
  - e) Discuss Laissez-Faire Leadership style in not more than 30 words.
  - f) List down two differences between democratic and Beurocratic leadership styles.
  - g) Write down any four barriers of effective communication.
  - h) What do you understand by the term 'stress'.
  - i) What is resistance to change?
  - j) Two ways to restore organizational conflict.

## **Group - B**

**Answer any FOUR questions.**

2. a) Significance of Organizational Behavior [8]  
b) Learning - importance to Organizational Behavior. [8]
3. What are groups? Discuss the various types of groups that exist in organizations. [16]
4. Draw and explain the Maslow's hierarchy of needs. [16]
5. Discuss Likert's four systems of leadership. Depict the key traits of each theory. [16]
6. a) Draw and explain the organizational communication process. [8]  
b) What are the barriers to effective communication? [8]
7. Discuss the various sources of conflict. How can these conflicts be resolved. [16]
8. Write short notes on: [8x2]
  - a) Resistance to Change.
  - b) Organizational Diagnosis.



**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- SOCIOLOGY**

Time: 4 Hours

**PAPER : 302**

Full Marks: 80

*The figure in the right hand margin indicate marks.  
Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

[2 x8

**1. Answer any EIGHT of the following.**

- i) What is epistemology?
- ii) How do you differentiate between induction and deduction?
- iii) Explain common sense knowledge and scientific knowledge.
- iv) What do you mean by validation of knowledge?
- v) Explain the role of computer in research.
- vi) How a research problem is formulated?
- vii) Describe the major types of hypothesis.
- viii) What is PRA?
- ix) Differentiate between nominal and ordinal scale.
- x) Write a short note on Bogardus scale.
- xi) Explain Sociometry technique.
- xii) What is the role of scaling in research?

[2]

**Group - B**

[16 x 4

**Answer Any FOUR questions.**

2. Briefly analyse the process of theory building in social science research.
3. What is logic of inquiry in social science research?
4. What is hypothesis? Discuss the role of hypothesis in social science research.
5. Analyse the application of Word, Exel and Power Point and Internet in research context.
6. Briefly describe the strength and limitations of PRA method of social research.
7. Analyse the role of fieldwork is social science research.
8. Analyse the different measures of social distance used in social research.
9. Define reliability and validity and discuss its utility in social research.



**PG, 3<sup>RD</sup> SEMESTER EXAMINATION-2019**

**Sub: PSYCHOLOGY**

Full Marks: 60

**Paper: 302**

Time: 4 Hours

*Answer the questions as per instruction.  
The figure in the right hand margin indicate marks.  
Question No. 1 is mandatory.*

**GROUP-A**

[2x6]

**1. Answer any SIX questions.**

- (a) First order change and second order change.
- (b) Empowerment
- (c) Types of social action
- (d) Tertiary rehabilitation
- (e) Socially challenged group
- (f) Define consumer psychology
- (g) Google web search
- (h) PDF file

**GROUP-B**

[12x4]

**Answer any FOUR questions.**

2. Define community psychology. Briefly discuss the contribution of community psychology in resolving social issues.
3. Narrate the strategies to arouse community awareness of different societal problems.
4. Illustrate some important primary and secondary rehabilitation programmes.
5. Highlight some crucial factors to eliminate corruption in contemporary Indian society.

(P.T.O...)

[2]

6. What is sports psychology? Explain its usefulness in improving the achievement of sports persons.
7. Elucidate few important characteristics of computer.
8. Describe the application of computer in psychology.

- x - x - x -



**GACR**  
**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- POLITICAL SCIENCE**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 80

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Section- A**

[2 x 8

**1. Answer any EIGHT of the following.**

- a) Explain the importance of Political sociology.
- b) What is Political Power?
- c) Discuss the attributes of power.
- d) Define the nature of authority.
- e) Explain democratic elitism
- f) Give the important dimensions of political culture.
- g) Define political socialisation.
- h) Explain the role of political communication in Political System.
- i) What are the determinants of political participation.
- j) What is political modernisation?

## **Section - B**

**Answer any FOUR questions.**

2. Define Political Sociology and explain the nature and scope of it?
3. Define Authority. Discuss the types of authority according to Max Webber.
4. Examine the theory of democratic elitism of Robert A. Dahl and how it is different from the theory classical elitism.
5. What is Political Culture? Explain Almond's typology of political culture.
6. Define political communication and explain its different structures.
7. Examine different forms of political participation and discuss its various activities.
8. "Political development is multidimensional". Discuss.



**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- HISTORY**

Time: 4 Hours

**PAPER : 302**

Full Marks: 80

*The figure in the right hand margin indicate marks.*

*Question No.1 is compulsory, answer any FOUR from the rest.*

1. Answer any EIGHT questions of the following [2 x 8]
- Which Sufi saint was the teacher of Shaikh Nizamuddin Auliya?
  - The term Sufi derived from Arabic word 'Safa' which means?
  - Which Bhakti saint said "Ram and Rahim are two different names of God".
  - Who was the Guru of Meera Bai?
  - Who was the founder of city Fatepur Sikri?
  - When did Akbar propounded 'Din-i-llahi'?
  - Who started the construction of Qutub Minar?
  - Who was the chief architect of Taj Mahal?
  - Who was regarded as the 'Father of Qawwali'?
  - Who wrote 'Tarikh-i-Firoz Sahi'?

**Answer Any FOUR questions.**

[16x4]

2. Discuss the social stratification in medieval Rural society with reference to caste system and slavery.
3. Describe the rise of the Mercantile and professional classes in medieval urban society.
4. Assess the role of Kabir and Nanak in the Bhakti Movement.
5. Give an account of the origin, meaning and practices of the Sufi order in India.
6. Write a note on the Indo-Islamic Architecture in the Sultanate period.
7. Throw light on the cultural development of Medieval period with special reference to 'Din-i-Ilahi' and its impact on society.
8. Discuss the system of education and its motivation in medieval India.



GACR

PG, 3<sup>RD</sup> SEMESTER EXAMINATION-2019

Sub: HINDI

Full Marks: 80

Paper: 302

Time: 4 Hours

*Answer the questions as per instruction.*

*The figure in the right hand margin indicate marks.*

*Question No. 1 is mandatory.*

१. निम्नलिखित प्रश्नों में से किन्ही आठ प्रश्नों के उत्तर लिखिए। [2x8]

- (क) “अनुवाद” शब्द का व्युत्पत्तिमूलक अर्थ बताइए।
- (ख) अनुवाद में कितनी भाषाओं का होना जरूर है? उन भाषाओं को क्या कहा जाता है?
- (ग) कम्प्यूटर के अंगों का नाम लिखिए।
- (घ) “पल्लवन”के लिए अंग्रेजी में कौन-सा शब्द प्रचलित है?
- (ङ) “टिप्पणी” के उद्देश्य क्या है?
- (च) अनुवाद को विज्ञान माननेवाले क्या तर्क देते हैं?
- (छ) वेब ब्राउजर क्या है?
- (ज) पारिभाषित शब्दावली निर्माण की क्या-क्या आवश्यकताएँ हैं?
- (झ) “सारानुवाद” किसे कहते हैं?
- (ञ) साहित्यिक अनुवाद की किन्ही दो समस्याओं को लिखिए।

निम्नलिखित प्रश्नों का उत्तर लिखिए।

२. परिभाषित शब्दावलीके स्वरूप को स्पष्ट करते हुए उसके प्रमुख सिद्धांतों का उल्लेख कीजिए। [16]

अथवा

इंटरनेट-संयोजित कम्प्यूटर के विविध उपकरणों का परिचय दीजिए।

३. अनुवाद को परिभाषित करते हुए उसके क्षेत्रों पर प्रकाश डालिए। [16]

अथवा

अनुवाद प्रक्रिया के विविध सोपानों की चर्चा कीजिए।

४. अनुवाद के संदर्भ में समतुल्यता सिद्धांत की विशेषताओं को लिखिए। [16]

अथवा

अनुवाद के प्रकारों की चर्चा करते हुए उसकी प्रमुख समस्याओं को उल्लेख कीजिए।

५. किन्हीं दो पर टिप्पणियाँ लिखिए। [8+8]

(क) प्रारूपण

(ख) कम्प्यूटर और हिन्दी

(ग) साहित्यिक अनुवाद की प्रासंगिकता

(घ) विज्ञापन का अनुवाद

**GACR**  
**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- EDUCATION**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 60

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

[2 x 6

1. **Answer any SIX of the following.**
- a) What is the concept of curriculum according to Secondary Education Commission.
  - b) Difference between curriculum and text book.
  - c) Describe three language formula as envisaged in Education Commission, 1964-66.
  - d) What is concentric method of curriculum development.
  - e) Explain the principle of integration for curriculum development.
  - f) Write the first two steps of Taba's Grass root model.
  - g) Why is open education called so?
  - h) Explain micro teaching cycle by drawing a diagram.

**Group - B**

**Answer any FOUR questions.**

2. Describe the psychological bases of curriculum development.
3. Describe the recommendations of Education Commission relating to curriculum revision.
4. Describe the principles of curriculum development for elementary level.
5. Critically analyse Tylor's Model of Curriculum development.
6. What is Programmed Instruction? Describe the basic principle of Programming.
7. What is curriculum evaluation? Describe different types of curriculum evaluation.





**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- BOTANY**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 60

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

[2 x 6

1. **Answer any SIX of the following.**

- i) What are the different level of biodiversity?
- ii) What is red data book?
- iii) What is plant genetic resource?
- iv) Define ex-site conservation.
- v) Write scientific name of two fibre yielding plants.
- vi) What is plant introduction?
- vii) Write Botanical name and family of Sal tree.
- viii) Which plant is used for culture of eri silkworm?

[2]

**Group - B**

[12x 4

**Answer any FOUR questions.**

2. Give a brief account on convention of Biological Diversity.
3. Describe the concept of diversity in domesticated plants.
4. Discuss about the origin, evolution and wild relatives of rice.
5. Write notes on:
  - a) Wildlife sanctuaries
  - b) *In-vitro* conservation
6. Write notes on:
  - a) Domestication of cultivated plants
  - b) Primary centre of origin
7. Discuss the conservation strategies for wetlands & mangroves .
8. Write notes on:
  - a) Uses of medicinal plants
  - b) Managements of non-wood forest product.



**GACR**  
**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- ZOOLOGY**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 60

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

[2 x 6

1. **Answer any SIX of the following.**

- i) Draw IgG.
- ii) What is RIA?
- iii) Name two antigen presenting cells.
- iv) Define an antigen.
- v) What are CD4 and CD8?
- vi) What is allergy?
- vii) Name four carcinogens.
- viii) What is an isograft?

*P.T.O.*

**Group - B**

[12x 4

**Answer any FOUR questions.**

2. Give an account of innate immunity in mammals.
3. Discuss different types of ELISHA.
4. What is hypersensitivity? Give a detailed account of type W hypersensitivity.
5. Describe the characters of cancerous cells. Add a note on viral causes of cancer.
6. Give an account of genetic basis of formation of cancer cells.
7. Discuss activation of classical pathway of compliment system.
8. Describe initiation of humoral immune response.



**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- STATISTICS**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 60

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Section- A**

[2 x 6

1. **Answer any SIX of the following.**
- What are the requirements of a good experimental design?
  - What is experimental Error?
  - What are the different types of Statistical model for experimental design?
  - What are the demerits of CRD?
  - What are the demerits of LSD?
  - Explain Graeco Latin square design.
  - Explain Cross Over design.
  - Explain the concept of Strip plot Design.

**Section - B**

[12x 4

**Answer any FOUR questions.**

2. Explain the meaning of ANOVA and give its uses. State the basic assumptions in the ANOVA and also its applications.

3. Give the layout of a completely randomised block design and explain the situations when it is used. Discuss its merits and demerits.
4. What is Latin square design? How is the efficiency of a design measured. Derive the expressions to measure the efficiency of LSD when rows are used as blocks and columns are used as blocks.
5.
  - a) Describe the factorial method of experimentation. Explain the situation where it could be used.
  - b) Give the expression for the total effect, the main effect, SS due to an effect and the standard error of an effect for  $2^n$  experiments.
6. Construct a  $2^5$  design in 4 blocks of 8 treatments each, confounding the interaction effects ABC and ADE. What other effect, if any, is confounded in this layout.
7.
  - a) What is Split plot Design? Explain its advantages and disadvantages.
  - b) Prove that, In Symmetric BIBD the number of treatments common between any two block is  $\lambda$ .
8. Write short notes on (any TWO)
  - a) Balanced incomplete block design.
  - b) Advantages and disadvantages of Confounding.
  - c) Intra block analysis.



PG, 3<sup>RD</sup> SEMESTER EXAMINATION-2019

Sub: ODIA

Full Marks: 80

Paper: 302

Time: 4 Hours

*Answer the questions as per instruction.**The figure in the right hand margin indicate marks.**Question No. 1 is mandatory.*

କ-ବିଭାଗ

[2x8]

୧. ଯେକୌଣସି ୮ ଗୋଟି ପ୍ରଶ୍ନର ସଂକ୍ଷିପ୍ତ ଚିତ୍ରପଣୀ ଦିଅ ।

- (କ) ଆଧୁନିକ ଓଡ଼ିଆ ଲିପି
- (ଖ) ଓଡ଼ିଆ ଲିପିର ବିଶେଷତ୍ୱ
- (ଗ) ଓଡ଼ିଆ ଭାଷାରେ ଦ୍ରାବିଡ଼ ଭାଷା ପ୍ରଭାବର କାରଣ
- (ଘ) ଯାବନିକ ଭାଷା
- (ଙ) ଓଡ଼ିଶାରେ ପର୍ଯ୍ୟଟନ
- (ଚ) ଓଡ଼ିଆ ରୂପତତ୍ତ୍ୱ (ପଦ) ଉପରେ ଇଂରାଜୀ ପ୍ରଭାବ
- (ଛ) କୃଦନ୍ତର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ
- (ଜ) ବିଭକ୍ତି ଓ କାରକର ସମ୍ପର୍କ
- (ଝ) ଗୋପୀନାଥ ନନ୍ଦଶର୍ମାଙ୍କ ଭାଷାଗ୍ରନ୍ଥ
- (ଞ) ନୀଳକଣ୍ଠ ଦାସଙ୍କ ଲିପି ସଂସ୍କାର

ଖ-ବିଭାଗ

[16x4]

(ଦୀର୍ଘ ଉତ୍ତର ମୂଳକ ପ୍ରଶ୍ନ- ଯେକୌଣସି ୪ ଚିର ଉତ୍ତର ଲେଖ)

୨. ଓଡ଼ିଆ ଲିପିର କ୍ରମବିକାଶ ଆଲୋଚନା କର ।

ଅଥବା

ଓଡ଼ିଆ ଲିପିର ବୈଶିଷ୍ଟ୍ୟ ସମ୍ପର୍କରେ ସବିଶେଷ ଚର୍ଚ୍ଚାକର ।

୩. ଓଡ଼ିଆ ଭାଷାରେ ଦ୍ରାବିଡ଼ ଶବ୍ଦାବଳୀର ପ୍ରୟୋଗ ସମ୍ପର୍କରେ ବିଶ୍ଳେଷଣ କର ।

ଅଥବା

ଓଡ଼ିଆ ଭାଷାରେ ଯାବନିକ ଭାଷାର ପ୍ରଭାବ ଦର୍ଶାଅ ।

୪. ଓଡ଼ିଆରେ ପ୍ରଚଳିତ ପର୍ତ୍ତୁଗୀଜ ଶବ୍ଦଗୁଡ଼ିକର ପରିଚୟ ଦିଅ ।

ଅଥବା

ଓଡ଼ିଆ ଭାଷାରେ ଇଂରାଜୀ ଭାଷାର ପ୍ରଭାବ ବର୍ଣ୍ଣନା କର ।

୫. କାରକର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ ଆଲୋଚନା କର ।

ଅଥବା

କୃଦନ୍ତ ଓ ତଦ୍ଦିତ ମଧ୍ୟରେ ଏକ ତୁଳନାତ୍ମକ ଚର୍ଚ୍ଚା କର ।

୬. ଜର୍ଜ ଆରାହ୍‌ମ ଗ୍ରୀୟରସନଙ୍କ ଭାଷା ଦୃଷ୍ଟି ଆଲୋଚନା କର ।

ଅଥବା

ପଣ୍ଡିତ ଗୋପୀନାଥ ନନ୍ଦଶର୍ମାଙ୍କ ଭାଷା ବୈଜ୍ଞାନିକ କୃତିତ୍ୱ ବିଚାର କର ।



**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- ECONOMICS**  
**PAPER : 302**

Time: 4 Hours  
Full Marks: 80

*The figure in the right hand margin indicate marks.*

*Question No.1 is compulsory, answer any FOUR from the rest.*

**Section- A**

[2 x 8

**1. Answer any EIGHT of the following.**

- a) What is 'golden age growth'?
- b) Define total factor productivity.
- c) What is embodied technical progress?
- d) What is the basic objective of Cost-Benefit Analysis?
- e) Describe the assumption regarding Solow saving function.
- f) What is meant by shadow price?
- g) How is annual average growth rate (AAGR) computed?
- h) What do you mean by 'learning by doing'?
- i) Define human capital.
- j) What is internal rate of return?

## **Section - B**

[16x 4

**Answer any FOUR questions.**

2. Explain the growth model of James Meade.
3. Write notes on:
  - a) Kaldor saving function
  - b) Optional economic growth.
4. Explain the role of knowledge in economic growth as per the AK model.
5. Elucidate Uzawa's Two-sector model of economic growth.
6. Explain the concept of NPV and IRR as alternative investment criteria.
7. Elaborate the UNIDO guidelines for Project Evaluation.
8. Distinguish between Hicks neutral and Harrod neutral technical progress. Use diagrams.



GACR  
PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019

Sub : ENGLISH  
Paper : 302

Time : 3 Hours  
F.M : 80

*Figures in the right hand margin indicate marks.  
Question No.1 is compulsory. Answer any FOUR from the rest.*

**Section-A**

**Q1. Answer any eight questions :**

**[2x8=16]**

- a. What is Bibliography?
- b. What role does power point presentation plays in research work?
- c. What do you understand by persuasive writing?
- d. What is magazine writing?
- e. Briefly define application.
- f. What is plain and simple English?
- g. Explain review essay.
- h. What is meant by print media?
- i. What is a memo?
- j. What is a seminar paper?

P.T.O.

## Section-B

Answer any four questions :

[16x4=64]

- Q2. Discuss in detail different application of computer which helps in research writing.
- Q3. What are the characteristics of good writing? Explain and give examples.
- Q4. Data collection and interpretation is an important part in research. Discuss.
- Q5. What are news stories? Imagine yourself as a journalist and write one on a recent event organized in your city.
- Q6. Explain different stages of writing in detail.
- Q7. What is research methodology? Explain its characteristics.
- Q8. Define plagiarism. How to avoid plagiarism while writing research papers?



PG 3<sup>rd</sup> Semester Examination -2019  
Subject- Nanomaterials and Applications  
PHY-302 Full Marks:60

**Section A**

1. Answer any six Questions: [2×6=12]
- (a) What are the length scales in Physics? What are the properties changes with size reduction of the materials?
  - (b) Give four examples of top down and bottom up approach experimental method to prepared nanomaterials.
  - (c) Give a short account of nanodots and nanorods.
  - (d) Explain Electro deposition method with diagram.
  - (e) Derive and explain the diffraction condition for x-ray to study the crystal structure.
  - (f) Give a short account of nanowires and thinfilms for photonics device.
  - (g) What is CNT based transistor and explain with diagram.
  - (h) Explain Spray Pyrolysis method to prepared nanomaterial with diagram.
  - (i) Explain about the quantum dots heterostructure lasers with diagram.

**Section B**

**Answer any Fours [12×4=48]**

- 2. What is quantum confinement? Explain and write the total energy for quantum confinement of carrier in two dimensions (2D) and 1D. [12]
- 3. Write down the Schrodinger equation for three dimensional systems. Solve the equation to obtain the expression for density of states. Plot and discuss the variation of density of states with energy. [12]
- 4. Discuss with diagram for Photolithography method of preparing nanoscale particles. [12]
- 5. Discuss Sol-gel technique for synthesis of nanomaterials. [6]

**OR**

Explain how quantum dots can be used in solar cell and Light emitting diodes. [6]

6. What is Transmission Electron Microscopy? Discuss its various components and principles with diagram. [12]
7. Discuss the various components and working principle of Atomic force Microscopy with diagram. [12]
8. Write short notes [6×2=12]
  - (a) Nano Electromechanical Systems (NEMS)
  - (b) Single Electron Transistor

**GACR**  
**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**

**Sub.- MCS - Software Engineering**  
**PAPER : 302**

**Time: 4 Hours**  
**Full Marks: 80**

*The figure in the right hand margin indicate marks.*  
*Question No.1 is compulsory, answer any FOUR from the rest.*

**Group - A**

**1. Answer any SIX of the following.**

[2 x 8

- a) What is a prototype? Explain its necessity to develop a project.
- b) What are the strengths and weakness of the V-model?
- c) Identify the main motivation and goals behind the development of the RAD model.
- d) What do you mean by project size? What are the popular metrics to measure project size?
- e) Briefly explain the cocomo 2 model.
- f) Explain when should you use PERT Charts.
- g) What do you understand by the term project risk?
- h) Explain the characteristics of a good software design.
- i) What do you mean by balancing a DFD?
- j) Prove that branch coverage based testing is stronger compared to a statement coverage based testing.

*P.T.O.*

**Group - B****Answer any FOUR questions.**

2. a) Identify the major differences between the iterative and evolutionary SDLCs. [8]
- b) Explain why the spiral life cycle model is considered to be a meta model. [8]
3. a) Write down the major responsibilities of a software project manager. Explain with a suitable example. [8]
- b) Let the size of an organic type software product has been estimated to be 64,000 lines at source code, let the average salary of a software developer in Rs.20,000 per month. Determine the effort required to develop the software product, the nominal development terms and the cost to develop the product. [8]
4. a) Explain the important of WBS ( Work Breakdown structure) [8]
- b) Explain how Retran's model can be used to compute the change in project cost with project duration. [8]
5. a) What is the difference between functional and non-functional requirements? Give an example of each type of requirement for a library automation software. [8]

- b) What do you mean by the terms cohesion and coupling in the context of software design? How are these concepts useful on arriving at a good design of a system. [8]
6. a) What is unit testing? Describe statement coverage, branch coverage, condition coverage and path coverage with suitable examples. [8]
- b) Briefly explain integration testing and explain the advantages of mutation testing. [8]
7. a) Explain white box-testing vs Black box testing. [8]
- b) Define the terms software reliability and software quality. How can these be measured. [8]
8. Write notes on (any FOUR):
- a) COCOMO
- b) SRS
- c) LOC [16]
- d) Expert judgement Techniques
- e) Risk Assessment





PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019

Sub.- Math. (Differential Geometry)  
PAPER : P-302

Time: 3 Hours  
Full Marks: 60

*The figure in the right hand margin indicate marks.  
Question No.1 is compulsory, answer any FOUR from the rest.*

[6 x 2]

1. Answer any SIX of the following.

- What is the equation of osculating plane.
- Define the necessary condition that a curve will be a straight line.
- State Existence and uniqueness theorem.
- Define Developable surface.
- What is the condition that  $z = f(x, y)$  represent a developable surface.
- Define first fundamental form.
- What is the relation between E, F, G and H.
- Define principal curvature.

Answer any FOUR questions.

2. a) Prove that at the point of intersection of the

[8]

surfaces  $x^2 + y^2 = z^2$ ,  $z = a \tan^{-1} \frac{y}{x}$  where

$y = x \tan \theta$ , the radius of the curvature of the

interaction is  $a(2 + \theta^2)^{2/3} / (8 + 5\theta^2 + \theta^4)^{1/2}$

[2]

- b) Find the involute of the twisted curve given by  $x = u, y = u^2, z = u^3$ . [4]
3. a) Prove that Serret - Frenet formulae can be written in the form  $\vec{t}' = \vec{w} \times \vec{t}, \vec{n}' = \vec{w} \times \vec{n}$  and  $\vec{b}' = \vec{w} \times \vec{b}$ . Also determine  $\vec{w}$ . [6]
- b) Find the envelope of the plane  $lx + my + nz = 0$ , where  $al^2 + bm^2 + cn^2 = 0$  [6]
4. a) Prove that the surface  $xy = (z-c)^2$  is developable. [6]
- b) Find the equation of the tangent plane to a ruled surface. [6]
5. a) Calculate the fundamental magnitudes for the right helicoid given by  $x = u \cos v, y = \sin v, z = cv$  [6]
- b) Prove that if  $\psi$  is the angle at the point  $(u, v)$  between the two directions given by  $Pdu^2 + 2Qdudv + Rdv^2 = 0$ . then 
$$\tan \psi = \frac{2H(Q^2 - PR)^{1/2}}{ER - 2FQ + G}$$
 hence or otherwise find the condition that two directions are orthogonal.
6. a) If I, II and III represent 1st, 2nd and 3rd fundamental forms then prove that  $KI - 2\mu II + III = 0$  where K is Gaussian curvature and  $\mu$  is the mean curvature. [8]

[3]

- b) Prove that  $z = y \sin x$  is a ruled surface [4]
7. a) Prove that for the surface  $x = 3u(1+v^2) - u^2, y = 3v(1+u^2) - v^3, z = 3u^2 - 3v^2$  the asymptotic lines  $u \pm v$  is constant. [6]
- b) Find the equation of the developable surface which contains the two curves  $y^2 = 4ax, z = 0$  and  $(y-b)^2 = 4cz, x = 0$ . [6]
8. Write short notes on (Any Two) [6+6]
- a) Bertrand Curve
- b) Metric of a surface
- c) Principal radius
- d) Normal curvature.



**GACR**  
**PG 3<sup>rd</sup> SEMESTER EXAMINATION-2019**  
**(SCIENCE)**

SUBJECT: INORGANIC CHEMISTRY-IV  
PAPER CODE: CH-302

Full Marks: 60  
Time: 3 Hours

**The figures in the right hand margin indicate marks.**  
**Q.no.1 is compulsory. Answer any *Four* from *Section B***  
***Section-A***

**Q1.** Answer any **SIX:** **[2X6]**

- (a) Explain, why sodium cyanide is not an organometallic compound?
- (b) Draw the structure of Tri( $\mu$ -carbonyl)bis-tricarbonyl iron and Trichloro( $\eta^2$ -ethylene) palatinate(II) iron.
- (c) How can you prepare water gas? Write one importance of water gas?
- (d) Draw the structure of Ziegler-Natta catalyst? For what purpose it is useful?
- (e) What is radioactivity? What units is a radioactivity measured in?
- (f) Define radioactive tracers?
- (g) Define Lande splitting (g) factor in ESR?
- (h) Write four uses of EPR in chemistry?

***Section-B***

**Q2.** (a) Discuss 18-electron rule? Apply this rule to calculate the effective atomic number **[4+4]**  
of the metal in each of the following complexes: (i)  $[\text{CrCl}(\text{H}_2\text{O})(\text{en})_2]^{2+}$  and (ii)  
 $[\text{Mn}(\text{en})_2(\text{NO}_2)]^+$ .

(b) What are organometallic compounds? How are they classified? **[4]**

**Q3.** (a) Explain infrared spectral analysis of organometallic complex? **[5]**

(b) What is cyclic  $\pi$ -system ligand? Give some examples of this kind of ligand? **[3]**

(c) Explain bonding presence in fullerene complex? **[4]**

**Q4.** (a) Explain in detail on hydride elimination and carbonyl insertion process in **[4+4]**  
inorganic reaction? **P.T.O.**

- (b) Write a short note on Wacker process? [4]
- Q5. (a) Define oxo-process? Differentiate between homogeneous and heterogeneous catalyst? [2+4]
- (b) Explain hydrogenation reaction by Wilkinson's catalyst? [6]
- Q6. (a) Explain what is meant by rock dating and carbon dating? A freshly cut piece of wood gives 16100 counts of  $\beta$ -ray emission per minute per kg and an old wooden bowl gives 13200 counts per minutes per kg? Calculate the age of the wooden bowl? (The half life period of  $C^{14}$  is 5568 years). [2+2+3]
- (b) Write a short note on Q-value for a nuclear reaction? [5]
- Q7. (a) What are the processes used to detect and measure the radioactivity? Explain about Geiger-Muller counter process? [5+2]
- (b) Write a short note on neutron activation analysis? [5]
- Q8. (a) Describe zero field splitting in EPR? Write down significance of Kramer's degeneracy? [5+3]
- (b) Write a short note on significance of g-tensor? [4]
- Q9. (a) Explain Lande interval rule? State Van-Vleck's equation and its use in chemistry? [4+2+2]
- (b) Write a short note on Hyperfine splitting? [4]