GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: MCS Full Marks: 80

Paper: 104 Time: 4 Hours

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

1. Answer any EIGHT questions given below. [2x8]

(a) Define alphabet and language?

(b) State the difference between NFA aand DFA?

(c) Construct a DFA for all the strings containing exactly 4 zeros.

(d) When do you say a grammar is ambiguous?

(e) The language O^n where n is prime is regular or not?

(f) Difference between single tape and multi tape usage in TM.

(g) State the CNF and give an example of it?

(h) How do you say that a post correspondence problem is undecidable?

(i) The context sensitive languages are not accepted by PDA, why?

(j) Remove the unit production and Useless symbols from the following grammar.

$S \rightarrow ABA,\ A \rightarrow aAA|aBC|bB,\ B \rightarrow A|bB|Cb,$
$C \rightarrow CC|cC$

Answer any FOUR questions.

2. (a) IF 'L' is accepted by NFA with $\in$ transitions then L is accepted by NFA without $\in$ transitions. Prove the theorem. [8]

(P.T.O...)

(b) Write an Algorithm for equivalence of two finite state machines? With suitable example. [8]

3. (a) What are the closure properties of regular language? What is the use of Pumping Lemma? [10]

(b) Prove that the Language $L = \{(ab)^n a^k : n > k; k \geq 0\}$ is not regular? [6]

4. (a) What are the languages accepted by a PDA. Give an example of it. [8]

(b) Prove that NPDA is not equivalence to DPADA. [8]

5. (a) Determine the type of languaage accepted by this grammer and deduce it. $S \rightarrow aSb \,|ab| \in$. [8]

(b) What are the closure properties of CFL? Proof any of them. [8]

6. (a) Define Turing machine? State the techniques for Turiong Machine construction? [8]

(b) Prove that the halting problem of Turing Machine over $\{0,1\}^*$ is unsolvable. [8]
[8]

7. (a) Let Grammar

$$S \rightarrow bA|ab$$
$$A \rightarrow bAA|aS|a$$
$$B \rightarrow aBB|bs|b$$

Convert this grammar to CNF.

(b) Prove that every context free language is a member of P. [8]

8. Write short notes on following: (any Four) [4x4]
(a) Regular expression
(b) P class and NP class
(c) Decidability
(d) Church-Turing Thesis
(e) Transition system

- x - x - x -

GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.- BOTANY   Time: 4 Hours

PAPER : 104   Full Marks: 60

The figure in the right hand margin indicate marks.
Question No.1 is compulsory, answer any FOUR from the rest.
Draw labelled diagrams where ever necessary.

1.   **Answer any SIX of the following.**   [2 x6

a)   What is the significance of RUBISCO enzyme?

b)   In which parts of the plants are starch deposited?

c)   What is meant by apoplast?

d)   Differentiate between oxidative stress and oxidative damage.

e)   Write the location and function of H^+ ATPase

f)   How does SAR develop in plants?

g)   What are the effects of photoperiodism?

h)   How does endogenous clock in plants work?

        Answer Any FOUR questions.   [12 x 4

2.   Describe the mechanism of transport of water in plants.

3.   Illustrate the mechanism of electron and proton transport in photosynthesis.

4.   Describe glyoxylate cycle. What are its similarity with TCA cycle?

5.   Give an account of biological nithogen fixation.

6. Describe the physiological effects and mechanism of action of auxins.

7. Write notes on:
   a) Diffusion
   b) Growth retardants.

8. Write note on:
   a) Biotic stress
   b) Phytochromes as photoreceptor.

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GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.-ZOOLOGY   Time: 4 Hours
PAPER : P-104   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   [6 x 2

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

a)   What is Schizont phase in *Plasmodium*?

b)   What is the function of ommatidia in insects?

c)   What is the importance of strobilation in Jelly fish.

d)   What is the importance of torsion in *Pila*?

e)   Give the names of different larval forms seen in the life cycle of echinoderms.

f)   Which type of skulls are seen in reptiles?

g)   Describe some reptilian affinities of prototherians.

h)   What is circadian rythm and its importance in animals?

Group - B

[16x 4

Answer Any FOUR questions.

(Give diagram where necessary)

2. Describe the structure and function of water vascular system observed in star fish.

3. Discuss the life history of tape worm *Taenia Solium* in human.

4. Give an account of canal system in sponges.

5. Describe different types of accessory respirantary organs seen in fishes with examples.

6. Describe flight adaptation mechanism seen in birds.

7. Describe the structural and functional diversity of excretory systems seen in annelids.

8. Give an account of migration in fish with suitable examples.

GACR
PG 1st SEMESTER EXAMINATION-2019

Sub.- STATISTICS   Time: 4 Hours
PAPER : 104   Full Marks: 60

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

1.   **Answer any SIX of the following.**   [6 x 2

   a)   What is unbiased estimator?

   b)   What is the efficiency of an estimator.

   c)   What do you mean by minimal sufficient statistics?

   d)   Explain the concept of shortest confidence interval.

   e)   What do you mean by confidence region?

   f)   If x is a poisson (x, λ), the sufficient statistic for λ is _____ .

   g)   Bias of an estimator can be _____ .

   h)   What do you mean by CAN estimator.

   Answer Any FOUR questions.   [12 x 4

2.   a)   If T is an unbiased estimator of θ, show that $\sqrt{T}$ is not an unbiased estimator of $\sqrt{\theta}$.

   b)   Prove that the sample median is a consistent estimator for the mean of a normal population.

3.   a)   Let x be a $\gamma.v$ with exponetial density

$$f_\theta(x) = \theta. e^{-\theta x}, x > 0, \theta > 0.$$

Show that distribution of x is complete.

P.T.O.

b) If T is the most efficient estimate of θ and T is another estimate whose efficiency is e. Show that correlation coefficient between T and T is $\sqrt{e}$.

4. a) Define MVU estimator. Show that an MVU estimator. Show that an estimator is unique.

b) State and prove Lehmann Scheffe theorem.

5. a) If T is a consistent estimator θ, then show that T^2 is a consistent estimator of θ^2.

b) Find ML estimator of θ for $f(x, \theta) = \theta . e^{-\theta}$

6. a) Obtain $100(1 - \alpha)\%$ confidence interval for the parameters (a) θ (b) σ^2 for the Normal distribution.

b) Obtain $100(1 - \alpha)\%$ confidence limits (for large samples) for the parameter λ of the poisson distribution.

7. a) Give an example of an M.L. estimator which is not unbiased.

b) Write short notes on Chapman Robbins inequality.

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PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- CHEMISTRY Time: 4 Hours

PAPER : 104 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

[6 x 2

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

    a) Define the free energy function.

    b) What is desilverization of lead?

    c) What is translational partition function ?

    d) What do you mean by the most probable distribution for a microstate.

    e) Explain the term activity.

    f) What is stopped flow method?

    g) What is primary salt effect?

    h) Write the mechanism of chain reaction of hydrogen-bromine.

Group - B

Answer Any FOUR questions.

2. a) What is meant by Chemical Potential? How does [6+6
    chemical potential vary with temperature and pressure? Derive the Gibbs-Duhems equation.

    b) Explain the term Fugacity and how do you determine fugacity of a gas?

P.T.O.

3. a) Draw and discuss the phase diagram of Ferric chloride-water system.   [6+6

    b) Discuss the Ehrenfest classification of phase transitions.

4.   Write notes on-

    a) Molecular vibrational partition function of an ideal diatomic gas.   [6+6

    b) Bose-Einstein statistics for most probable distribution of N particles in various energy states.

5.   Write notes on-   [6+6

    a) Ensemble Averaging and its postulates.

    b) Fermi-Dirac statistics for most probable of N particles in various energy states.

6.   Discuss the dynamics of   [6+6

    a) Lindemann-Hinshelwood   Unimolecular reaction

    b) Pyrolysis of Acetal dehyde

7.   Discuss the following-   [6+6

    a) Oscillatory reaction

    b) Michelis Menten equation

8. a) Describe the relaxation method used in studying the kinetics of fast reaction.   [6+6

    b) Explain how the transition state theory helps in studying the ionic reactions.

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GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.- HINDI   Time: 4 Hours

PAPER : 104   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

[2x8]

1.   निम्नलिखित किन्हीं **आठ** प्रश्नों के संक्षिप्त उत्तर दीजिए।

क)   भाषा को 'सादृच्छिक ध्वनि प्रतीकों की व्यवस्था' क्यों कही जाती हैं?

ख)   'बोली' एवं 'भाषा' में क्या अंतर हो?

ग)   भाषा को 'सामाजिक संपत्ति' क्यों कही जाती है?

घ)   भाषा विज्ञान की प्रमुख शाखाओं का नाम लिखिए।

ङ)   भाषा विज्ञान के अध्ययन की बर्णनात्मक पद्धति किसे कहते है?

च)   तुलनात्मक भाषा विज्ञान किसे कहते हैं?

छ)   प्रयत्नलाघव के कारण भाषा विकास या परिवर्तन का एक उदाहरण दीजिए।

ज)   'स्वनिम' किसे कहते है?

झ)   पद एवं वाक्य में क्या अंतर है?

ञ)   'मिश्रवाक्य' किसे कहते हैं? मिश्रवाक्य का एक उदाहरण लिखिए।

[2]

GROUP - B

[16x4]

(निम्नलिखित किन्हीं चार प्रश्नों के उत्तर दीजिए)

2.   भाषा का विकास कहने से आप क्या समझते ? भाषा विकास
के प्रमुख कारणों की चर्चा कीजिए।

अथवा

भाषा विज्ञान के अध्ययन की विभिन्न दिशाओं का वर्णन कीजिए।

3.   ध्वनि के वर्गीकरण को विस्तार से समझाइए।

अथवा

वाग्यंत्रों का सचित्र वर्णन कीजिए।

4.   अर्थ परिवर्त्तन की दीशाओं को विस्तार से समझाइए।

अथवा

शब्दो के प्रकाशों को सोदाहरण लिखिए।

5.   किन्ही दो पर संक्षिप्त टिप्पणियाँ लिखिए

    क)   राजभाषा

    ख)   भाषाविज्ञान एवं व्याकरण

    ग)   रूप विज्ञान

    घ)   वाक्य परिवर्त्तन की दिशाएँ

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: PSYCHOLOGY   Full Marks: 60

Paper: 104   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 given below.

(a) Hostile aggression

(b) Instrumental agression

(c) Impact of instinct on aggression

(d) Cultural influence on aggressoin

(e) Violence against women

(f) Aggression and violence

(g) Crimnology and psychology

(h) Criminal profiling

GROUP-B
Answer any FOUR questions.   [12x4]

2.   Briefly discuss different causes of aggression.

3.   Explain various strategies to control aggression.

4.   Critically examine the social learning theory and cognitive theory of aggression.

5.   Define violence. Write down the nature and characteristics of violence.

6.   Highlight some important techniques for prevention and control of violence.

(P.T.O...)

[2]

7. What is crime? Substantiate different theoretical explanations of crime and criminal behaviour.

8. Discuss different methods of prevention and control of crime in general.

- x - x - x -

GACR

PG, 1ˢᵀ SEMESTER EXAMINATION-2019

Sub: POL. SCIENCE Full Marks: 80

Paper: 104 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

1. Write short notes on EIGHT of the followings. [2x8]

(a) What do you mean by international politics?

(b) What is the realism of Morgenthau?

(c) Write two features of systems approach in international politics.

(d) Write two elements of national interest.

(e) What is balance of power?

(f) Write two features of collective security.

(g) Define New Cold-War.

(h) Explain the nature of Unipolarity in internaational politics.

(i) Is Non-Alignment relevant tooday?

(j) Mention two important objectives of SAARC.

GROUP-B [16x4]
Answer any FOUR questions.

2. Briefly trace the history of evolution of international politics as a subject of study. Discuss its nature and significance.

(P.T.O...)

3. What do you mean by Realism? Critically examine the nature and importance of Morgenthau's Realist theory of international politics.

4. 'The balance of power and policies aiming at its preservation are not only inevitable, but are an essential stabilizing factor, in a society of sovereign nations'. Comment

5. Do you agree that 'Collective Security' has sometimes been called 'Selective Security'. Give reasons for your answer.

6. Explain the major causes which led to the emergence of Cold-War in international politics. How did it affect the international politics of the post-war period.

7. Critically examine the relevance of NAM in contemporary international politics.

8. 'Terrorism has been posing a major challenge to international peace and security. Explain the efforts being made by the world for eliminating this menace.

- x - x - x -

GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.- SOCIOLOGY   Time: 4 Hours

PAPER : 104   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.**

   a)   What is Social Structure?

   b)   Mention S.C. Dube's views on Caste and village Leadership.

   c)   What do you mean by Unemployment?

   d)   Write Hardiman's idea of understanding the history of bellows.

   e)   Define dowry. When dowry prohibition Act was passed?

   f)   Highlight MN Srinivas's idea on Indian village.

   g)   What is Ghurye's views on caste and Tribe?

   h)   Write any two main causes of poverty in India.

   i)   Mention main causes of Dowry in India.

   j)   Highlight A R Desai's contribution on state and society.

P.T.O.

Group - B

[16 x 4

Answer Any FOUR questions.

2. Describe G.S. Ghurye's contribution on Indian caste system.

3. Srinivas's concept of Sanskritization as a process of socio-cultural change in Indian society, discuss.

4. Discuss the contribution of Ranjit Guha in understanding the history of bellows.

5. Analyse the contribution of S.C. Dube on structure, function and change of Indian villages.

6. Examine D.P. Mukherjee's views on Tradition and Modernity.

7. Discuss briefly N.K. Bose and Surjit Sinha's civilizational perspectives of Indian society.

8. Write down the strategies of the Government to tackle unemployment problem in India.

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: HISTORY   Full Marks: 80

Paper: 104   Time: 4 Hours

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

1. Answer any EIGHT questions given below.   [2x8]

(a) How many non-permanent members are in UN security council?

(b) Where is interanatonal court of Justice situated?

(c) When was the Unversal Declaration of Human Rights adopted?

(d) How much aid did the United states provide through the Marshall plan?

(e) Which country withdrew from military command structure of NATO in 1966?

(f) Where did Albania withdraw the Warsaw Pact?

(g) In which year Wall of Berlin was built?

(h) Who was the President of the United States at the time of the Cuban Missile Crisis?

(i) When did camp David Accord signed between Egypt and Israel?

(j) Who was the First Secretary General Non-Alignment Movement?

(k) In which year ASEAN was formed?

(l) How many countries are in SAARC?

(P.T.O...)

[2]

Answer any FOUR questions. [16x4]

2. Give a brief account of the formation and structure of UNO.

3. Write a note on the UN Human Right Commission.

4. Explain the factors responsible for the Cold War between USA and USSR.

5. Write an essay on the formation, structure and objectives of NATO.

6. Critically analyse Cuban Missile Crises and its implication during the course of Cold War.

7. Trace out various reforms of Gorbachev in USSR.

8. Discuss about Arab-Israel conflict(1947-1978) and impact on Middle Eastern countries.

9. Write a detailed note on SAARC.

- x - x - x -

GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: ECONOMICS   Full Marks: 80

Paper: 104   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   [2x8]

1. Answer any EIGHT questions given below.

(a) What is meant by strangulation of industry?

(b) What do you mean by liberallisation of trade?

(c) Define BOP.

(d) What was the primary objective behind nationalisation of banks?

(e) What are the features of the New Economic Policy?

(f) Distinguish between 'absolute' poverty and 'rrelative' poverty.

(g) Define 'inflation'.

(h) Which sector of the Indian economy is called tertiary sector?

(i) Which sector of the Indian economy exhibits disguised unemployment?

(j) What do you understand by 'food security'?

GROUP -B
Answer any FOUR questions.

2. Discuss the impact of nationalisation of banks on various sectors of the Indian Economy.

3. Give an account of the New Industrial policy.

4. Explain the old and new methods of poverty estimation.

(P.T.O...)

5. Analyse the benefits of trade liberalisation during the third phase of economic reforms in India. [16x4]

6. Examine the importance of public investment in agriculture in India.

7. How far do you agree with the view that inflation stimulated economic development in countries like India?

- x - x - x -

GACR

PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- ENGLISH   Time: 4 Hours

PAPER : 104   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)   Abraham Adams

   ii)   Uriah Heap

   iii)   Harriet Smith

   iv)   Frank Churchill

   v)   Mr. Micawer

   vi)   Mrs. d Urbervilles

   vii)   Angel Clare

   viii) Dora

   ix)   Lady Booby

   x)   Jane Fairfax

P.T.O.

Group - B

[16 x 4

Answer Any FOUR questions.

2. Discuss *David Copperfield* as a veiled autobiography of Dickens.

3. Discuss *Emma* as a lively comedy of Manners.

4. Analyse *Joseph Andrews* as a picaresque novel

5. Discuss *Tess of the d Urbervilles* as an illustration of Hardy's tragic view of life.

6. David is the most credible and realistic portrayal of all Dickensian heroes. Discuss.

7. Discuss Joseph Andrews as a "Comic epic in prose" as described by fielding himself.

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: ODIA   Full Marks: 80

Paper: 104   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 ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ ।

(କ) 'କାଆ ତରୁବର ପଞ୍ଚବିଡାଲ' ର ଅର୍ଥ କ'ଣ ?

(ଖ) 'ହିଅ ତାଁ ବୋଲା ମହାସୁଖେ କାପୁର ଖାଇ' –'ମହାସୁଖ' ଶବ୍ଦର ଅର୍ଥ କଣ ?

(ଗ) 'କଳସା ଚଉତିଶା' ର ବିଷୟ ବସ୍ତୁ କେଉଁ ପ୍ରସଙ୍ଗକୁ ଭିତ୍ତିକରି ଲିଖିତ ହୋଇଛି ?

(ଘ) ଅବଧୂତ ବ୍ରାହ୍ମଣ କୁମାରୀଠାରୁ କେଉଁ ଶିକ୍ଷା ପାଇଥିବା କଥା କହିଛନ୍ତି ?

(ଙ) 'କହିଲେ ସେ ଯେଣୁ, କର ରେ ମାତ୍ର ଲେଖିଲି ମୁଁ ତେଣୁ'– କେଉଁ ପ୍ରସଙ୍ଗରେ କୁହାଯାଇଛି ?

(ଚ) 'ପ୍ରେମ ସୁଧାନିଧି' କାବ୍ୟରେ କେଉଁ ରସର ଆଧିକ୍ୟ ଦେଖିବାକୁ ମିଳେ ?

(ଛ) 'କମ୍ବୁକଟକ' କହିଲେ କାହାକୁ ବୁଝାଏ ?

(ଜ) କବି ଅଭିମନ୍ୟୁ 'ବିଦଗ୍ଧ ଚିନ୍ତାମଣି' କାବ୍ୟର କାବ୍ୟପାକ ବା ରଚନା ଶୈଳୀ ସମ୍ପର୍କରେ କଣ ଉଲ୍ଲେଖ କରିଛନ୍ତି ।

(ଝ) 'ଛନ୍ଦଣି ବନ୍ଧଣି ବନ୍ଧନୀ ଭୁଜଦଣ୍ଡ' ର ଅର୍ଥ ବୁଝାଇ ଦିଅ ।

(ଞ) 'ମଉବାରଣ' ବୋଲି କାହାକୁ ଓ କାହିଁକି କୁହାଯାଇଛି ।

ଖ-ବିଭାଗ (ଦୀର୍ଘଉତ୍ତର ମୂଳକ ପ୍ରଶ୍ନ)
ଯେକୌଣସି ୪ଟିର ଉତ୍ତର ଦିଅ ।

[16x4]

୨. 'ଚର୍ଯ୍ୟାଗୀତିକା' ର ସାହିତ୍ୟିକ ମୂଲ୍ୟାୟନ କର ।

୩. ସମକାଳୀନ ସମାଜରେ ପ୍ରଚଳିତ ବିବାହ ବ୍ୟବସ୍ଥାର ନିଖୁଣ ଚିତ୍ର 'କଳସା ଚଉତିଶା'ରେ କିପରି ବର୍ଣ୍ଣିତ, ଆଲୋଚନା କର ।

୪. ଚତୁରଗୁରୁ ପ୍ରସଙ୍ଗରୁ କବି ଜଗନ୍ନାଥ ଦାସଙ୍କ ଆଧ୍ୟାମ୍ନିକତାର ପରିଚୟ ପ୍ରଦାନ କର ।

୫. "ମୁକୁଙ୍ଗ କଳଙ୍କ କରି ଉଦ୍ଧରିଲ ଯେ ମାନଙ୍କୁ"- ଉକ୍ତିରୁ ଏକଲବ୍ୟର ଆମ୍ଭ ଅଭିମାନ କିପରି ପ୍ରତିଫଳିତ ଉପସ୍ଥାପନ କର ।

୬. 'ଅପ୍ରାକୃତ ପ୍ରେମମୂର୍ତ୍ତି' ରାଧା ଓ ହରିଙ୍କ ଅବ୍ୟକ୍ତ ପ୍ରେମଲୀଳା 'ବିଦଗ୍ଧ ଚିନ୍ତାମଣି' କାବ୍ୟରେ କିପରି ପ୍ରତିଫଳିତ ଆଲୋଚନା କର ।

୭. 'ରସକଲ୍ଲୋଳ' କାବ୍ୟର ପ୍ରଥମ ଛାନ୍ଦରେ କବି ଜଗନ୍ନାଥ ଓ ଶ୍ରୀକ୍ଷେତ୍ରର ଯେଉଁ ବଳିଷ୍ଠ ରୂପଚିତ୍ର ଉପସ୍ଥାପନ କରିଛନ୍ତି –ବର୍ଣ୍ଣନା କର ।

୮. 'ଆହେ ନୀଳ ଶୈଳ' କବିତାରୁ କବିଙ୍କ ଭକ୍ତିମଭାର ପରିଚୟ ପ୍ରଦାନ କର ।

୯.   ଜୀବ ଓ ପରମର ମିଳନ ରହସ୍ୟକୁ କବି 'ରାସପଞ୍ଚାଧ୍ୟାୟୀ'ରେ ଯେପରି ସାଙ୍କେତିକ ଭାବରେ ଉପସ୍ଥାପନ କରିଛନ୍ତି– ଆଲୋଚନା କର ।

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GACR
PG 1st Semester End Examination-2019
(SCIENCE)

SUBJECT : PHYSICS   Full marks - 60

PAPER : 104   Time: 4 Hours

The figures in the right hand margin indicate marks

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

(1) Answer any SIX of the following questions   [2×6]

(a) What is a continuous group ? Give example.

(b) What is homomorphism and isomorphism?

(c) Explain the meaning of the statement

       1 FORMAT (1X,10F10.4)

(d) What is CALL and EXTERNAL statements.

(e) What is the work done by the following statements?

       (i) OPEN (4,FILE='A.FLE', STATUS='NEW')

       (ii) OPEN (3,FILE='RIN.DAT', STATUS='OLD')

(f) What is a COMMON statement? Give an example.

(g) What is EQUIVALENCE and REAL *8 (A-H,O-Z) statements.

(h) Explain the meaning of the IF statement

       IF (X-X0) 8,8,12

(2) (a) Show that the Pauli matrices are the generators of SU(2).   [6]

(b) Determine three SU(2) subgroups of SU(3).   [6]

(3) Write short notes on

(a) Lie group generators and algebra   [6]

(b) SO(3) group   [6]

(4) (a) Write a program to find the values of   [6]

$$1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \cdots + \frac{1}{21}$$

(b) Write a program to find the maximum and the minimum of given n numbers. [6]

(5) Discuss the varius type of conditional statements with examples. [12]

(6) (a) Write a simple program to read two complex numbers A and B. Evaluate A+B, A-B, AB, A/B and print them. [8]

(b) Explain [4]

(i) GO TO 20   (ii) Nested DO loop   (iii) RETURN
(iv) IF ELSE

(7) (a) What is the difference between a function sub-program and subroutine sub-program. Give examples. [6]

(b) Write a program to solve the quadratic equation using subroutine.[6]

(8) (a) Write a program to add and multiply two 3 × 3 matrices. [6]

(b) Discuss READ a data file and WRITE the data into a file with different FORMAT. [4]

(c) Explain OPEN and CLOSE statements with examples. [2]

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GACR

INSTRUCTION TO THE CANDIDATE

(STRIKE OFF THE APPLICATION)

M.A IN EDUCATION-SEM-I

SUBJECT: Advanced Methodology of Educational Research- FULL MARKS: 60

PAPER: 104

TIME: 3 Hours

1. All questions carry equal marks
2. Marks have been mentioned in the right hand corner
3.(a) Question No-1 is mandatory having ten bit questions to answer eight bits among them.
 (b) Q No-2 to Q.No-7 has subjective and candidate to answer four among them.

(In case of practical subject candidate has to answer 6 bit questions for Q No-1 i.e 6x2=12 and other longs are 12 marks each)

Q1. Answer the following questions (any six)

(a) What do you mean by Basic Research? Give an Example.

(b) What do you mean by Ex post facto Research? Give an Example.

(c) Define Null and alternative Hypothesis.

(d) What do you mean by Snow ball Sampling?

(e) What do you mean by structured questionnaire?

(f) Define caption and stub.

(g) What is basic difference between classification and tabulation.

(h) What is the purpose of review of literature in research?

Q2. What are the stages involved in educational research ?Explain. [12]

Q3. (a) Differentiate between questionnaire and schedule. [6+6]

 (b) What are the guidelines for preparation of an questionnaire

Q4. What is sampling? Explain different types of sampling. What are the procedures involved in Random sampling with giving advantages and disadvantages.[12]

Q5. (a)What do you mean by classification? Mention its objectives and requirements.

 b)What is tabulation? Explain its objectives and importance. [6+6]

Q6. What is research report? Explain structure or layout of research report.[12]

Q7. Write short notes on⊗any two) [6+6]

 (a) Evaluation of research report

 (b) Rating scale

 (c) ⸱Purpose and sources of review of literature

b) Solve the following game problem using dominance property. [6

Player B

$$Player\ A \begin{bmatrix} 3 & 2 & 4 & 0 \\ 3 & 4 & 2 & 4 \\ 4 & 2 & 4 & 0 \\ 0 & 4 & 0 & 8 \end{bmatrix}$$

8. Write short notes on any TWO. [6+6

a) Big -M Method

b) Least Cost Method

c) Gomory's Cutting plane Method

d) Two person zero sum game.

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PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- Mathematics (Operations Research)

Time: 3 Hours

PAPER : P-104   Full Marks: 60

The figure in the right hand margin indicate marks.
Question No.1 is compulsory, answer any FOUR from the rest.
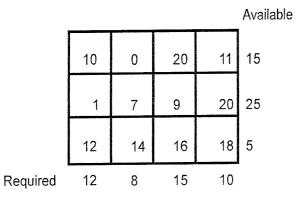
1. **Answer any SIX of the following.** [6 x 2

a) Test the concavity of $f(x) = x_1^2 + 3x_1x_2$

b) Under what condition solution of a LPP degenerate.

c) Find the dual of *Min z = 5x₁+2x₂* subject to

$$3x_1 - x_2 \leq > 7$$

$$x_1 + 2x_2 \geq 5$$

and $x_1, x_2 \geq 0$

d) Write the LPP form of TP

e) Under what condition an AP gives optimum solution.

f) State Dominance property of Game Theory.

g) Give one example of mixed integer problem.

h) State principle of optimality with respect to Dynamic programming.

P.T.O.

Answer any FOUR questions.

2.a) Solve the following LPP using Graphical method. 6]

$Max\ z = 4x_1 + 3x_2$

Subject to, $2x_1 + x_2 \leq 1000$, $x_1 + x_2 \leq 800$

$x_1 \leq 400$, $x_2 \leq 700$

where $x_1 \geq 0\ and\ x_2 \geq 0$

b) Prove that the set $X = \{ (x_1, x_2, x_3):$ 6]

$2x_1 - x_2 + x_3 \leq 4 \} \subset R^3$ is a convex set.

3. a) Use two-phase simplex method to solve 6]

Maximize $z = 3x_1 - x_2$ subject to

$2x_1 + x_2 \geq 2$, $x_1 + 3x_2 \leq 2$, $x_2 \leq 4$

and $x_1 \geq 0$, $x_2 \geq 0$

b) State and prove Basic Duality theorem. 6]

4. a) Find the optical solution of the TP 6]

				Available
10	0	20	11	15
1	7	9	20	25
12	14	16	18	5

Required   12   8   15   10

b) Find the optimal solution of an AP 6]

	1	2	3	4
A	8	7	9	10
B	7	9	9	8
C	10	8	7	11
D	10	6	8	7

5. a) Use revised simplex method to solve 6]

$Max\ z = x_1 = -3x_2$ Subject to

$x_1 + x_2 \leq 4$, $2x_1 + x_2 \leq 5$, $x_1\ 2x_2 \leq 6$ and

$x_1 \geq 0$, $x_2 \geq 0$,

b) Describe the procedure to obtain dual of an LPP. 6]

6. a) Describe branch and bound method for integar programming problem.

b) Describe dynamic programming algorithm.

7. a) Solve the following 2 - person zero sum game

Player A

$Player\ B \begin{bmatrix} 8 & 15 & -4 & -2 \\ 19 & 15 & 17 & 16 \\ 0 & 20 & 15 & 5 \end{bmatrix}$

GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: COMMERCE Full Marks: 80

Paper: 104 Time: 4 Hours

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

1. **Answer any EIGHT questions given below.** [2x8]

   (a) Capital Reserve
   (b) Authorized capital
   (c) Contigent Liabilty
   (d) Amalgamations
   (e) Contributory
   (f) Fraudulent preference
   (g) Super profits
   (h) Deficiency Account
   (i) Doctrine of Reputed ownership
   (j) Purchased Goodwill

Answer any FOUR questions.

2. Following is the trial balance of Zee Ltd. as on 31.03.2019. [16]

Debit Balances	Rs.	Credit Balalnces	Rs.
Stock on 1.4.18	75,000	Purchase Returns	10,000
Purchase	2,45,000	Sales	3,40,000
Wages	30,000	Discount	3,000
Carriage	950	Surplus A/C	15,000
Furniture	17,000	Share Capital	1,00,000
Salaries	7,500	Creditors	17,500
Rent	4,000	General Reserve	15,500
Trade expenses	16,950	Bills payable	7,000
Debtors	27,500		

(P.T.O...)

Debit Balance	Rs.	Credit Balalnce	Rs.
Plant	29,000		
Cash at Bank	45,300		
Patents	4,800		
Bills Receivable	5,000		
	5,08,000		5,08,000

Loan-H Ltd.	10,000	—	Surplus Account	—	1,000
Loan -M Ltd.	—	8,000	(Dr. Balance)		
	70,000	34,000		70,000	34,000

Required:

Prepare Final account of the company after considering the following adjustments (a) Closing Stock Rs. 88,000 (b) Provide for income tax @ 35% & corporate dividend tax @10% (c) Depreciate Plant at 15%, Furniture 10% and Patents at 5% (d) Outstanding rent Rs 800 and outstanding salaries Rs 900 (e) Provide Rs 510 for doubtful debts (f) The board recommends payment of dividend @15% (g) Transfer the minimum required amount to general reserve.

3. Discuss the mathods of calculating net profit for the purpose of calculating the managerial remuneration. [16]

4. Define goodwill. Enumerate the factos that should be considered in valuing goodwill. Briefly explain their importance in this regard. [16]

5. What is funds flow statement? How is it prepared? What are the various sources and uses of funds? [16]

6. Following are the summarized balance sheet of M Ltd and N Ltd. [16]

Liabilities	M Ltd.	N Ltd.	Assets	M Ltd.	N Ltd.
Share capital	40,000	20,000	Sundry assets	42,000	33,000
Surplus Account	5,000	—	Shares in N Ltd.	20,000	—
Creditors	15,000	6,000	Loan N Ltd.	8,000	—

The whole of the shares of N Ltd. are held by M Ltd. A new company MN Ltd. is formed to acquire the sundry assets & creditors of M Ltd. & N Ltd. and for this purpose, the sundry assets of M Ltd. are revalued at Rs. 30,000 & those of N Ltd. at Rs. 20,000. The amount of the loan due to H Ltd. is also to be discharged in shares in the new company: the debt due to M Ltd. is also to be similarly discharged. Show the journal centries to close the books of M Ltd. & N Ltd.

7. Explain the various provisions of capital reduction as given in the companies act, 1956. [16]

8. Bihar Coal Ltd. leased a colliery from Himalaya Coal Ltd. on 1st Jan 2000, at a minimum rent of Rs. 30,000 merging into a royalty of Rs. 1.50 per ton with power to recoup short workings during the first three years of the lease. The output of the colliery for the five years of the lease was 9000, 15000, 27000, 17000 and 28000 tons respectively. Pass the journal entries for five years for the above transactions in the books of Himalaya Coal Ltd. Also prepare the analytical table for making the calculation. [16]

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