GACR
+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub: CHEMISTRY   Full Marks: 60

Paper: CORE-VII   Time: 3 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) Define and explain degree of freedom with suitable examples.

   (b) What are azeotropes?

   (c) What are solid solutions?

   (d) Give an example of pseudo unimolecular reaction and explain its unimolecularity.

   (e) Define catalyst. Give one chemical reaction. Where it is used?

   (f) Defferentiate between adsorption and absorption.

   (g) What is lever rule?

   (h) Explain selectivity of catalyst with an example.

SECTION - B
Answer any FOUR questions.

2. (a) Draw and discuss the phase diagram of water system.   [6]

   (b) Discuss the application of Clausius-Clapeyron equation for liquid-vapour equilibrium.   [6]

3. Wrte notes on   [4x3]

   (a) Gibbs phase rule

   (b) Congruent melting point

   (c) Traingular plot

4. (a) Explain phenol water system.   [4]

   (b) Discuss fractional distillation of ideal and non-ideal   [8]
      solutions.

5. (a) Derive differential and integrated form of expression for   [7]
      the rate constant of the reaction, $2A \rightarrow B+C$.

   (b) How much time is required for the completion of 90% of   [3]

      the first order reaction?($\dfrac{t1}{2}$=30 minutes)

   (c) Explain specific rate constant with an example.   [2]

6. (a) Discuss the kinetics of consecutive reaction.   [6]

   (b) Wrie notes on Collision theory of reaction rate.   [6]

7. (a) Discuss briefly Michaelis-Menten mechanism of enzyme   [4]
      catalyzed reaction.

   (b) Write a note on Acid-Base catalysis.   [8]

8. (a) Deduce the expression for Gibbs adsorption isotherm.   [8]

   (b) Distinguish between physical adsorption and   [4]
      chemisorption.

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GACR

+3, 3rd SEMESTER EXAMINATION-2019 (ARTS)

Sub.- PSYCHOLOGY

PAPER : Core-VII

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.

Group - A

[2 x 6

1. **Answer any SIX of the following in two or three sentences each.**

    a) Meaning and concept of deep ecology.

    b) Green house effect and energy depletion.

    c) Sustainable development

    d) Bio-social psychology

    e) Meaning & concept of ecological psychology

    f) Environmental deprivation meaning & effect

    g) Define ecological system.

    h) Proenvironmental behaviour.

P.T.O.

Group - B

[12x4

Answer any FOUR questions.

2. Explain gain hypothesis in context to earth as a living system.

3. Discuss field theory approaches to environment.

4. Show your acquitance with the ecosystem and their components.

5. Describe natural and man-made disaster & its effects on human psychology.

6. Discuss cause, effect and prevention of global warming.

7. Elucidate various social movements for creating environmental awareness.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub.- CSC   Time: 3 Hours
PAPER : Core - VII   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 questions of the following**   [2 x 6

  a) Among the first 1000 positive integers: determine the integers divisible by 5, but not by 7, not by 9.

  b) Give an example of a graph that has neither an Euler circuit nor a Hamiltonian circuit.

  c) Draw a graph whose every edge is a bridge.

  d) Define Hamming Code.

  e) Define a path and the length of a path.

  f) When a graph is called an Eulerian graph?

  g) What is a group code?

  h) Define permutation functions.

        Answer Any FOUR questions.   [6x2

2. a) Prove that $n(n+1)(n+2)$ is a multiple of 6.

  b) Let S be the set of all points in a plane. Let R be a relation such that for any two points a and b; (a,b) $\in$ R if b is within two centimetre from A. Show that R is an equivalence relation

3. a) Let A = { 4, 6, 8, 10} and R = {94, 4), (4, 10), (6, 6), (6, 8), (8,10)} is a relation on Set A. Determine the transitive clousure of R using Warshall's algorithm.   [6

                                          P.T.O.

b) If r (x,y) is the remainder when y is divided by x. [6
Prove that r(x,y) is a primitive recursive function.

4. a) State the necessary and sufficient condition for
the existence of an Eulerian circuit in a connected [6
graph.

b) What are the advantages of Warshall's algorithm
over Dijkstra's algorithm for finding shortest [6
paths in weighted graph?

5. a) The necessary and Sufficient condition for a non
empty subset H of a group $\{G,*\}$ to be a sub [6
group is a, b εH→a* b$^{-1}\varepsilon$H.

b) Let B be a Boolean algebra, show that:
(*i*) For any x in B,0< x <1 [6
(*ii*) a< b if and only b′ < a′.

6. a) State and prove Bays theorem.

b) Derive mean and variance of Binomial
distribution. [6

7. Answer the following questions:

a) Show that the sum of degree of all the vertices in
a graph G, is even. [12

b) Prove that in any graph, there are an even number
vertices off odd degree.

c) Show that if in a graph, G there exists one and
only one path between every pair of vehicles, the
G is tree.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019 (ARTS)

Sub.- Political Science
PAPER : Core-VII

Time: 3 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 x8

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

a) What do you mean by International Relations?

b) Define Treaty of Westphalia.

c) What is classical Realism?

d) Write two features of Neo-Liberalism.

e) Explain Eurocentricism

f) Write down two major causes of World War I.

g) What was the core issue of Bolshevik Revolution?

h) What do you understand by Cold-war?

i) Write two causes of the collapse of the USSR.

j) What is Fascism?

P.T.O.

SECTION- B

Answer any FOUR questions. [16x4

2. Discuss the nature and scope of International Relations. Is there any difference between international relations and international politics?

3. Explain the nature and utility of classical realism to the study of international relations.

4. 'Eurocentrism is no longer the dominant discourse in international relations'- Comment.

5. Discuss the major causes and consequences of World War I.

6. Analyse the causes of the rise of Nazism and its impacts on international relations.

7. Briefly trace the evolution of the Third World. Explain the major problems faced by it.

8. Emerging world order of the post Cold-War era is moving from unipolarity towards multipolarity or polycentrism. Elucidate.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub.- HISTORY   Time: 3 Hours

PAPER : Core-VII   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

   i)   What do you mean by numismatic?

   ii)   Who has written the book titled 'A study of muslim inscriptions'?

   iii) Who was founder of Tughluq dynasty?

   iv)   Which book was written by Ibn-Batuta?

   v)   Who had introduced market reformes?

   vi)   Who was the founder of Pala dynasty in Bengal?

   vii) Who said "Kingship knows not kinship"?

   viii) Who is Salim chisti?

   ix)   Who was provincial ruler during the Sultanate?

   x)   In which book the Teachings of Kabir find place?

Answer any FOUR questions.   [16 x4

2.   Briefly describe the literary sources to reconstruct the history of Delhi Sultanate?

3.   Examine the administrative and military reforms of Ala-ud-din?

4.   Describe the various reforms of Muhammad-bin-Tughluq?

5.   Discuss the religious condition during the Sultanate period.

6.   Give a brief account of Urban centres of Sultanate period.

7.   Describe the main architectural features of Delhi Sultanate.

8.   Analyse the main features of Sufism and its impact on Indian society.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub: BOTANY   Full Marks: 60
Paper: CORE-VII   Time: 3 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. **Write short notes on any SIX of the following. Each in 3 to 5 sentences.**

   (a) Autosomes and Sex Chromosomes

   (b) Sex Linkage

   (c) Physical mutagens

   (d) Pleiotropy

   (e) Kappa particles

   (f) Position effect

   (g) Imcomplete dominance

   (h) Structure of phage T_4

SECTION - B
Answer any FOUR questions.

2. What is aneuploidy? How it differs from euploidy? Narrate different types of aneuploidy.   [12]

3. What are Mendel's laws of inheritance? Explain how these laws can be deduced from his experiment.   [12]

4. What do you mean by gene interaction? Explain complementary factors with suitable examples.   [12]

(P.T.O...)

5. What do you mean by linkage? Describe the method of detection of linkage in living organisms. [12]

6. Define gene mutation. What is the basis of this mutation? How different chemicals can cause mutation? [12]

7. What is cytoplasmic inheritance? Discuss cytoplasmic inheritance in relation to variegation in Four O'clock plant. [12]

8. Write notes on [6x2]

    (a) Hardy-Weinberg law

    (b) Epistasis

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub: HINDI
Paper: CORE-VII

Full Marks: 80
Time: 3 Hours

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

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

(क) अरुण किस राज्य का राजकुमार था?

(ख) यहनासिंह किस युद्ध में मारा गया?

(ग) "कलाकार" कहानी का मुख्य उद्देश्य क्या है?

(घ) गनेशी किसका नौकर था?

(ङ) भोलाराम का जीव रामलोक में क्यों नहीं पहुँचा?

(च) "पंचलाईट" कहानी का शीर्षक कितना सही है और क्यों?

(छ) गजाधरबाबु की पत्नी अपने पति के साथ क्यों घर नहीं छोड़ती?

(ज) कहानी के अंत में राजा से मधुलिका क्या पुरस्कार माँगती है?

(झ) "रानी माँ का चबुतरा" कहानी का संदेश क्या है?

(ञ) "पुस की रात" कहानी में किसान का नाम क्या है?

निम्नलिखित चार प्रश्नो का उत्तर लिखिए। [16x4]

२. पुरस्कार कहानी में वर्णित राष्ट्रप्रेम एवं व्यक्तिगत प्रेम के द्वन्द्व को रेखांकित कीजिए।

३. एक यथार्थवादी कहानी के रूप में **पुस की रात** की समीक्षा कीजिए।

४. "उसने कहा था" कहानी का मर्म समझाइए।

(P.T.O...)

५. "भोलाराम का जीव" में वर्णित भ्रष्टाचार की समस्या पर आलोकपात कीजिए।

६. "मुगलों ने सल्तनत बरव्श दी" कहानी की समीक्षा कीजिए।

७. "पंचलाईट" में आंचलिकता के स्वरूप की चर्चा कीजिए।

८. "रानी माँ चबुतरा" कहानी का सार अपने शब्दों में लीखिए।

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(SCIENCE)

Sub: PHYSICS   Full Marks: 60

Paper: CORE-VII   Time: 3 Hours

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

GROUP - A

1. Answer any SIX questions.   [2x6]

(a) Explain Active and Passive components of electronic circuit.

(b) Convert $(2564)_{10}$ into hexadecimal number.

(c) How Boolean algebra differs from binary number systems.

(d) Draw the block diagram of CRO.

(e) Draw the block diagram and give truth table of 3 inputs and 2 outputs full substractor.

(f) What is 555 IC timer? Write its important features.

(g) What is shift register? What is the clock pulse in it?

(h) Distinguish between Analog and digital circuits.

SECTION - B
Answer any FOUR questions.

2. (a) What is integrated circuit. Give its classification and discuss about various scale of integration in ICs.   [8]

(b) What are advantages and drawbacks of integrated circuits.   [4]

(P.T.O...)

3. (a) State and prove De Morgan's theorem. [6]

   (b) Write short notes on SOP and POS. [6]

4.   What is CRO? Derive an expression for magnetostatic [12] deflection sensitivity of CRO.

5. (a) What are multiplexer and demultiplexer? Explain with logic [6] circuits.

   (b) Explain 4:1 multiplexer and 1:4 de multiplexer with truth [6] table and logic circuits.

6. (a) Describe 555 timer as Astable multivibrator and [8] monostable multivibrator.

   (b) Explain RAM and ROM [4]

7.   Describe 4-bit parallel in serial out (PISO) shift register [12] and 4-bit parallel in-parallel out (PIPO) shift register with logic circuit.

8.   What is logic gate? Describe NAND, NOR, XOR and [12] XNOR gates with logic symbol, logic circuit and truth table.

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GACR

+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub.- ZOOLOGY
PAPER : Core - VII

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.

GROUP -A

[2 x 6

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

   a) How many types of scales are present in fishes. Write their names & give examples of their presence in different fishes.

   b) What is the name of Intestinal juice, name two enzymes present in it?

   c) What are the differences between Trachea & Tracheae?

   d) Write the difference between single circulation & double circulation of blood with examples.

   e) Write the types of Kidneys found in Amphobians & Reptiles.

   f) Write down the technical terms for contraction & relaxation of heart.

   g) Write the names of Cranial nerves which controls gastric & pancreative enzymes & smell?

   h) Write down the technical terms for contraction & relaxation of heart.

P.T.O.

GROUP-B

Answer Any FOUR questions. [12x4

2. Give a competitive account of derivatives of integument in vertebrates & their functions?

3. Describe the accessory respiratory organs in fishes & their functions.

4. Briefly narrate the Evolution of heart in vertebrates.

5. Give comparative development of urinogenital duct in vertebrates?

6. Give an account of cranial nerves in man & their functions.

7. Write notes on any TWO of the following.

   a) Structure & functions of pancreas.

   b) Classification of Receptor organs.

   c) Structure of kidney in man.

8. Write notes on any TWO of the following.

   a) Fore limb bones of Mammal & Bird

   b) Jaws suspensorium in vertebrates.

   c) Write the structure of Neuron & write the different types of Neuron.

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GACR

+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub.- ODIA

Time: 3 Hours

PAPER : Core - VII

Full Marks: 80

ଯେ କୌଣସି ୫ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ । ପ୍ରଥମ ପ୍ରଶ୍ନର ଉତ୍ତର ଅନିବାର୍ଯ୍ୟ ।

The figure in the right hand margin indicate marks.

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ଯେକୌଣସି ୮ଟି ପ୍ରଶ୍ନର ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ ।

୧. କ) 'ଫୋକଲୋର୍'ଶବ୍ଦ ସମ୍ପର୍କରେ ସୂଚନା ଦିଅ ।

ଖ) 'ଲୋକ ସାହିତ୍ୟର ସମପର୍ଯ୍ୟାୟବାଚୀ ଶବ୍ଦଗୁଡ଼ିକ କ'ଣ ?

ଗ) କୁଞ୍ଜବିହାରୀ ଦାଶଙ୍କୁ 'ଲୋକରନ୍' କହିବାର ତାତ୍ପର୍ଯ୍ୟ କ'ଣ ?

ଘ) ଗୋଟିଏ 'ଶିଶୁଗୀତିକା'ର ଦୃଷ୍ଟାନ୍ତ ଦିଅ ।

ଙ) ଓଷା ଓ ବ୍ରତ ମଧ୍ୟରେ ମୌଳିକ ପାର୍ଥକ୍ୟ ଦର୍ଶାଅ ।

ଚ) କିମ୍ବଦନ୍ତୀମୂଳକ କାହାଣୀ କ'ଣ ବୁଝାଇ ଦିଅ ।

ଛ) 'ସତ୍ୟପୀର' ଦେବତାଙ୍କ ମାହାମ୍ୟ ସୂରୁଥ ।

ଜ) ପାଲା ଓ ଦାସକାଠିଆ ମଧ୍ୟରେ ପାର୍ଥକ୍ୟ କ'ଣ ?

୫) "ଦିନେ ନାଙ୍ କାଳେ ନାଙ୍, ଗହ୍ଲାପୂନେଇଁରେ ମାଇଁ ମାଇଁ" ଏହାର ଅର୍ଥ ବୁଝାଅ ।

ଞ) 'କଟକ ଚିନ୍ତା ବାଇମୁଣ୍ଡିକି' – ଏହି ପ୍ରବାଦର ମର୍ମାର୍ଥ ଲେଖ ।

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(ଯେ କୌଣସି ୪ଟି ପ୍ରଶ୍ନର ଦୀର୍ଘ ଉତ୍ତର ଲେଖ)

୨   ଲୋକ ସଂସ୍କୃତିର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ ସମ୍ପର୍କରେ ଚର୍ଚ୍ଚା କର ।

ଅଥବା

ଲୋକ ସାହିତ୍ୟ ଓ ବିଦଗ୍ଧ ସାହିତ୍ୟ ମଧ୍ୟରେ ପାର୍ଥକ୍ୟ ବର୍ଣ୍ଣନା କର ।

୩.   ଲୋକଗୀତରେ ପ୍ରତିଫଳିତ ଓଡ଼ିଆ ସାମାଜିକ ଜୀବନର ଚିତ୍ର ପ୍ରଦାନ କର ।

ଅଥବା

ଓଡ଼ିଆ ଲୋକଗୀତର ପ୍ରକାରଭେଦ ଆଲୋଚନା କର ।

୪.   ଲୋକକାହାଣୀର ଭାଷା ଓ ଶୈଳୀ ସମ୍ପର୍କରେ ଆଲୋଚନା କର ।

ଅଥବା

ନୈତିକ ମୂଲ୍ୟବୋଧ ହିଁ ଲୋକକାହାଣୀ ଗୁଡ଼ିକର ଅନ୍ୟତମ ବିଶେଷତ୍ୱ – ଏ ଉକ୍ତିର ଯଥାର୍ଥତା ପ୍ରତିପାଦନ କର ।

୫.   ଆଦିବାସୀ ଲୋକନାଟକ ଗୁଡ଼ିକର ସ୍ୱରୂପ ଆକଳନ କର ।

ଅଥବା

ଲୋକନାଟକର ମଞ୍ଚମୂଲ୍ୟ ବିଷୟରେ ଆଲୋକପାତ କର ।

୬.   ସାମାଜିକ ଜୀବନରେ ଓଡ଼ିଆ ଢଗ ଢମାଳିର ଭୂମିକା ନିର୍ଣ୍ଣୟ କର ।

ଅଥବା

ପ୍ରବାଦ ଓ ପ୍ରବଚନର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ବୈଶିଷ୍ଟ୍ୟ ବିଶ୍ଳେଷଣ କର ।

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GACR

+3, 3rd SEMESTER EXAMINATION-2019 (ARTS)

Sub.- ENGLISH   Time: 3 Hours
PAPER : Core-VII   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   [2x8

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

   i)   What is the American Dream?

   ii)   What is slave narrative?

   iii)   Why is *Incidents in the Life of a Slave Girl* autobiographical?

   iv)   What is *Billy Budd* about?

   v)   Write a short note on Captain Vere.

   vi)   State the theme of "A Noiseless Patient Spider".

   vii)   Why does the speaker say "And that has made all the difference" in "The Road Not Taken"?

   viii) State the theme of "Fire and Ice".

   ix)   What is "Thirteen Ways of Looking at a Blackbird". about?

   x)   Why is Desire Under the Elms called a tragedy?

P.T.O.

SECTION - B [16x4

Answer any FOUR questions.

2. Write a note on American literature.

3. Discuss the theme of incidents in the *Life of a Slave Girl.*

4. Sketch the character of Billy Budd.

5. What does the speaker say in "When I Heard the Learn'd Astronomer"?

6. Critically appreciate "The Road Not Taken".

7. Critically appreciate "Disillusionment of Ten O'clock".

8. Discuss the theme of *Desire Under the Elms.*

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GACR

+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub.- ETC   Time: 3 Hours
PAPER : Core - VII   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 questions of the following**   [2 x 6

a)   Find the range of signed decimal numbers that can be represented by 6 bits 1's complement number.

b)   Find BCD equivalent of Excess 3 code 11001010.

c)   Prove that $AB + A'C + BC = AB + A'C$

d)   Briefly explain Fan-in of a logic family.

e)   Give the difference between sequential circuit and combinational circuit.

f)   Draw the full-adder circuit using half adder.

g)   Draw the state table and excitation Table of T flip flop.

h)   What do you mean by Dual slope converter?

Answer Any FOUR questions.

2.   a)   Convert following number from one system to another.   [6x2

i) $(274.35)_{10}$ to Binary   ii) $(FACE)_{16}$ to octal

P.T.O.

b) What is the use of 2's compliment form of representing a number? Explain 2's compliments method to perform subtraction operation.

3. a) Simplify AB +A (B+C) +B (B+C) using boolean algebra theorem.   [6x2

   b) List all digital logic family. Discuss the characteristics of any two.

4. a) What are the advantages of CMOS over TTL logic family? Draw the circuit diagram of TTL.   [6x2

   b) Simplify following boolen function using k-map.

   $$F(w, x, y, z) = \sum (2, 3, 10, 11, 12, 13, 14, 15)$$

5. a) Differentiate between Multiplexer and de-multiplexer. Explain 1:4 demultiplexer with a neat diagram.   [6x2

   b) Explain the operations of serial-in and serial-out shift register.

6. What do you mean by flipflop? How many flipflops are required to design a 16-bit register? Explain the working of J.K. flipflop and SR flip flop.   [12

7. a) What is counter? Draw a state diagram and logic diagram of a 4 bit ring counter using D flip flop.   [6x2

   b) What are the differences between D/A and A/D converter? Discuss R/2 R Ladder DAC.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(SCIENCE)

Sub: MTC   Full Marks: 60

Paper: CORE-VII   Time: 3 Hours

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

1. Answer any SIX questions.   [2x6]

(a) Form the partial differential equaton for $z=ax^2+by$

(b) Form the differential equation corresponding to family of parabola vertex at origin.

(c) Define linear partial differential equation with example.

(d) Solve $(D^2-4D^{12})z=0$

(e) Use separation of variable to solve $\dfrac{\partial \mu}{\partial x}+3\dfrac{\partial \mu}{\partial t}=0$.

(f) State D-Alembert's solution of one dimensional wave equation.

(g) Verify $\mu(x,y)=\dfrac{x}{y}$ satisfies Laplace equation or not.

(h) Solve $p+q=z$

Answer any FOUR questions.

2. (a) Form the partial differential equation for   [6]

$z = yf(x) + xg(y)$

(b) Find the general integral of   [6]

$xzp + yzq = xy$

(P.T.O...)

3. (a) Find the general solution of $\dfrac{dx}{dt} = 5x + 3y; \dfrac{dy}{dt} = 4x + y$. [6]

(b) Find the complete integral of the equation $x^2p^2 + y^2q^2 = z^2$ [6]

4. (a) Find the complete integral using charpit's method [6]
$px + qy = pq$

(b) Find the complete integral of $p^2x^2 = z(z - qy)$ [6]

5. (a) Solve the equation [6]

$(2D–D'+4) (D + 2D' + 1)z=0$

(b) Solve the equation [6]

$(x^2D^2 - yD'^2 - D' + xD)z=0$

6. (a) Classify and reduce the equaation $r + 2s + t = 0$ [6]

to canonical form. [6]

(b) Solve $r - t = 0$ by Monge's method. [6]

7. (a) Find the solution of one-dimensional wave equation. [6]

(b) Transform Laplace equation in cartesian form to polar form. [6]

8. (a) Solve $\dfrac{d^2\mu}{x^2} = a^2 \dfrac{d^2\mu}{t^2}$ using separation of variable. [6]

(b) Solve $\dfrac{dx}{x+z} = \dfrac{dy}{y} = \dfrac{dz}{y^2 + z}$ [6]

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GACR

+3, 3rd SEMESTER EXAMINATION-2019 (ARTS)

Sub.- SOCIOLOGY　　　　　　Time: 3 Hours

PAPER : Core - VII　　　　　　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 x 8

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

a)　Discuss the scope of Rural sociology.

b)　What is Rural-Urbanism?

c)　Mention any two cases of rural migration.

d)　Write the features of village community.

e)　Suggest two measures for eradication of casteism in India.

f)　Write two causes of indebtedness.

g)　Mention the objectives of Total Sanitation Campaign (TSC).

h)　Discuss the importance of Community Development Programme.

i)　Write the role of Panchayats in Rural Development.

j)　Describe the objectives of National Livelihood Mission.

P.T.O.

GROUP- B

[16x4

Answer any FOUR questions.

2. Discuss the importance of Rural Sociology in India.

3. Discuss the factors influencing changing caste system in India.

4. What is Food Insecurity? Discuss its causes.

5. Define sanitation and mention the steps for maintaining rural sanitation.

6. Examine the impact of Green Revolution in India.

7. Examine the role of Panchayatiraj Institutions for rural development.

8. Discuss the causes and consequences of Land Alienation.

9. Write the goals and objectives of National Rural Health Mission.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019 (SCIENCE)

Sub: STATISTICS
Paper: CORE-VII

Full Marks: 60
Time: 3 Hours

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

1. Answer any SIX questions. [2x6]

(a) What is meant by unbiasedness of estimator?

(b) Define minimax estimator.

(c) BAN estimators possess_____ property.

(d) If the sufficient estimator exists, it is a function of the _____ estimator.

(e) Consistent estimators are not necessirly_____.

(f) Bias of an estimator can be _____.

(g) Define mean squared error consistency.

(h) Define complete parametric families.

Answer any FOUR questions.

2. (a) Show that in random sampling from a normal population the sample mean is a consistent estimator for the population mean. [6]

(b) If T is an unbaised estimator for Q, show that T^2 is a biased estimator for Q^2. [6]

3. (a) Show that in estimating for the mean for random sampling from a normal population with mean μ and variance δ^2 show that sample mean is more efficient than the sample median. [6]

(P.T.O...)

(b) Let $x_1, x_2, x_3 \ldots \ldots x_n$ be a random sample from $N(\mu, \sigma^2)$ [6]

population. Find suffcient estimators for μ and σ^2.

4. (a) State and prove Rao-Cramner inequality. [6]

   (b) Obtain the $M \cup B$ estimator for μ in normal population [6]
   $N(\mu, \sigma^2)$, where σ^2 is known.

5. (a) In random sampling from Normal population $N(\mu, \sigma^2)$, [6]
   find M,L.E for μ when σ^2 is known and σ^2 when μ is known.

   (b) If a suffieicnt estimator exists, it is a function of the [6]
   M.L. estimator.

6. Obtain $100(1-\alpha)\%$ for the parameters Q and σ^2 for the [12]
   normal distribution.

7. Write short notes on (any Two) [6+6]

   (a) Gauss Markov linear model

   (b) Properties of estimator

   (c) Applications of Rao-Blackwel theorem.

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub.- PHILOSOPHY Time: 3 Hours
PAPER : Core- VII 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 x 8

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

    i)   What is Empiricism?

    ii) What is the significant of innate idea?

    iii) What is the meaning of apriori knowledge?

    iv) What is the notion of substance according to Locke?

    v)   What is inductive method?

    vi) What is teleological argument for the existence of God?

    vii) What is the nature of idealism?

    viii) What is Descartes body and mind relationship?

    ix) What is Descartes idea of God?

GROUP- B

[16x4

Answer any FOUR questions.

2. Explain and examine Thomas Acquinas cosmological argument for all existence of God.

3. Discuss Francis Bacon's the notion of idolas.

4. Explain and examine the philosophical explanations of Rine Descarte's logito Ergo sum.

5. Give a brief exposition of Locke's ideas of substance.

6. Discuss Locke's philosophical significance of theory of knowledge.

7. What is the nature of Berkeley's ideas of substance? Elucidate.

8. Discuss in brief Berkeley's theory of knowledge.

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GACR
+3, 3ʳᵈ SEMESTER EXAMINATION-2019 (COMMERCE)

Sub: HRM   Full Marks: 80

Paper: CORE-VII   Time: 3 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.   [2x8]

(i) Define HRP. What are the objectives of HRP?

(ii) What do you mean by workforce diversity?

(iii) Define empowerment.

(iv) What do you mean by employee induction programme?

(v) What are the benefits of training programme? (Give any two benefits).

(vi) Define job evaluation.

(vii) What do you mean by potential appraisal?

(viii) What do you mean by career development?

(ix) Define employee Grievance.

(x) What are the objectives of employee transfer? (Give any two objectives).

Answer any FOUR questions.

2.   Discuss the emerging challenges faced by HRM.   [16]

3. (a) State the importance of test in selection process.   [8]

   (b) Differentiate between recruitment and selection.   [8]

(P.T.O...)

4. Discuss the quantitative & qualitative dimensions of   [16]
    HRP.

5. (a) Write notes on employee counselling.   [8]

   (b) State the importance of performance linked   [8]
   compensation system.

6. Define training. Explain the types of training &   [16]
    development need analysis.

7. (a) Write notes on employee welfare.   [8]

   (b) State the importance of Social Security.   [8]

8. Define Industrial dispute. What are the various causes   [16]
    of industrial dispute?

- x - x - x -

+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub: EDUCATION   Full Marks: 80
Paper: CORE-VII   Time: 3 Hours

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

Q1.   Answer the following questions (any six)

(a)   What is Secondary data? Explain merits of Primary data.

(b)   Define Normal Probability Distribution

(c)   Discuss three limitations of Statistics.

(d)   Define discrete variables.Give an example.

(e)   Write any two demerits of Arithmetic mean.

(f)   What is positive correlation?Give an example.

(g)   In which situation t test is used.

(h)   Define various types of frequency distribution graphs.

Q2.   Define Statistics.Briefly Explain the role of Statistics in Education.   [12]

Q3.   Find mean,median and mode of the following data: [12]

X:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
F:	10	18	22	33	36	39	22	18

Q4.   What are the procedures involved in Collection of primary data, with giving advantages and disadvantages.   [12]

Q5.   Find out coefficient of Quartile deviation from the following data: [12]

Class Interval :	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency :	8	16	22	30	24	12	4	4

Q6.   Ten students have obtained the following marks in Accountancy and Economics. Find the rank coefficient of correlation from the following data: [12]

X:25	30	38	22	50	70	30	90	38	50
Y:50	40	60	40	30	20	40	70	60	65

Q7.   (a)   Explain chief characteristics of Normal probability curve.[4+8]

(b)   A sample of 230 persons with a particular disease was selected.Out of them ,115 were given drug and others were not.The results were observed as follows:

	No of Persons given drug	No of Persons given No drug	
Cured	60	70	130
Not Cured	55	45	100
Total	115	115	230

Test whether the drug has been effective in curing the disease.(Using chi square test at 5% level of significance.) [Table of Chi square 0.05,1d.f=3.84].

- x - x - x -

b) Write the causes of seasonal variation and write the characteristics of seasonal variation. [3 +3

8. a) Define probability and explain the various types of probability [10

b) (i) State Bayesian theorem of probability.

(ii) What is the difference between simple event and compound event. [3 +3

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GACR
+3, 3rd SEMESTER EXAMINATION-2019
(ARTS)

Sub.- ECONOMICS Time: 3 Hours
PAPER : Core - VII 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 x 8

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

a) What is arithmetic average?

b) State the formula for calculation of Harmonic mean.

c) Define Co-efficient of correlation.

d) What do you mean by Galton's graph?

e) What is regression line?

f) Define secular trend.

g) Define Index number.

h) What is Time series?

i) Define mutually exclusive events.

j) Define Inverse probability.

P.T.O.

GROUP- B

[16x4

Answer any FOUR questions.

2. a) Calculate the standard deviation, Coefficient of variation and variance for the following data [10

X:	3	4	5	6	7	8	9
F:	3	7	22	50	78	32	8

b) i) What is the difference between absolute and relative dispersion. [3 +3

   ii) What is the difference between range and quartile deviation.

3. a) Calculate Karl Pearson's coefficient of skewness from the following data : [10

Marks:	0-10	10-20	20-30	30-40	40-50
No. of students:	6	15	20	13	8

b) (i) What is the difference between Skewness and Kurtosis? [3 +3

   (ii) Write the merits and demerits of central tendency.

4. a) From the following data, compute pearson's co-efficient of correlation and its probable error. [10

Age group:	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Percentage of Success:	39	40	43	43	36	39	48

b) i) Write the merits and demerits of Rank correlation. [3 +3

   ii) What are the differences between total and partial regression.

5. a) Find the two regression equations of the following data. [10

X:6	2	10	4	8
Y:9	11	5	8	7

b) Explain the following [3 +3

   i) Linear Vs non linear regression

   ii) Simple Vs multiple regression

6. a) Calculate the Karl pearson's coefficient of correlation from the following data. [10

X:55	56	57	58	59	60	61
Y:60	70	62	69	72	69	68

b) Write short notes on [3 +3

   (i) Perfect correlation

   (ii) Positive correlation

7. Taking the deviations of the time variable compute the trend values for the locality data by the method of least square.

Days:	1	2	3	4	5	6	7
Sales :(Rc):	20	30	40	20	50	60	80

[10

GACR

+3, 3ʳᵈ SEMESTER EXAMINATION-2019
(SCIENCE)

Sub: MATHEMATICS   Full Marks: 80
Paper: CORE-VII   Time: 3 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.**   [2x8]

   (a) Give an example of non-homogeneous linear system of differential equation.

   (b) Prove that $x = c_1 e^t + c_2 t e^t$; $y = 2c_1 e^t + c_2(2t-1)e^t$ is general solution of $\dfrac{dx}{dt} = 3x - y$; $\dfrac{dy}{dt} = 4x - y$.

   (c) Form the p.d.e. for z=ax+by.

   (d) Define complete integral with example.

   (e) Eliminate the arbitrary function $z = f\left(\dfrac{xy}{z}\right)$

   (f) Write down two dimensional laplace equation in polar form.

   (g) Solve $(D^2 - D'^2)z = 0$

   (h) Solve $(D - 2D' + 5)z = 0$

   (i) Solve $\dfrac{\partial u}{\partial x} = 2\dfrac{\partial u}{\partial t}$ using separation of variables.

   (j) Write down the diffusion equation.

Answer any FOUR questions.

2. (a) Solve $\dfrac{dx}{dt}+4x+3y=t$; $\dfrac{dy}{dt}+2x+5y=e^t$ using operator   [8]

    method.

  (b) Find the general solution of the system   [8]

$$\frac{dx}{dt}=x-4y \; ; \; \frac{dy}{dt}=x+y$$

3. (a) Form the p.d.e. by eliminating the arbitraary constant.   [8]

    $z = ax^2 + bxy + cy^2$

  (b) Find the general integral of   [8]

    $(3x+y-z)p + (x+y-z)q = 2(z-y)$

4. (a) Find the complete integral using Charpit's method.   [8]

    $(p^2 + q^2)\, y = qz$

  (b) Find the complete integral of   [8]

    $p^2 + q^2\, y = z^2(x+y)$

5. (a) Solve the p.d.e.   [8]

    $(D+D'-1)\,(D+2D'-3)z = 4 + 3x + 6y$

  (b) Solve the p.d.e   [8]

    $(x^2 D^2 - 4y^2 D'^2 - 4y\,D' - 1)z = x^2 y^2 \log y$

6. (a) Reduce the euqation $\dfrac{\partial^2 z}{\partial x^2} + x^2 \dfrac{d^2 z}{dy^2} = 0$ [8]

    to canonical form.

  (b) Use separation of variable method to solve   [8]

$$\frac{\partial^2 x}{\partial x^2} - \frac{dx}{dy} - 2x = 0$$

7. (a) Transform Laplace equation of Cartesian co-ordinate to polar form.   [8]

  (b) Solve one-dimensional diffusion equation using separation of variable.   [8]

8. (a) Solve $\dfrac{\partial^2 y}{\partial t^2} = c^2 \dfrac{d^2 y}{dx^2}, -0 < x < l, t < 0$ [8]

    when $y(x,0) = 0, \dfrac{\partial y}{\partial t}\bigg]$

    $y(0,t) = 0, \dfrac{\partial y}{\partial t}\bigg]\, t = 0$

  (b) Use D-Alembert's solution method to solve one-dimensional wave equation.   [8]

$$- x - x - x -$$