GACR

+3, 1st SEMESTER EXAMINATION-2018 (SCIENCE)

Sub: ETC   Full Marks: 60

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

Quention No. 1 is compulsory and any FOUR from the rest 7 questions

1. Answer any SIX questions.   [2x6]

(a) What is simple harmonic oscillation? Write differential equation of simple harmonic motion.

(b) Distinguish between longitudinal and transverse waves.

(c) What is superposition of waves? Give examples.

(d) What is Fraunhofer diffraction of light waves?

(e) What is double refraction? Give exmples.

(f) What is Lorentz transformation?

(g) State Faraday's law in electromagnetic induction.

(h) What is de Broglie hypothesis to wave-particle duality?

2.   Discuss the concept of forced oscillation with reference to transient and steady states, resonance, sharpness of resonance, power dissipation and quality factor.   [12]

3. Write short notes on:

(a) Huygen's Principle   [6]

(b) Newton's ring   [6]

4.   What is diffraction of light waves? Explain Fresnel's diffraction due to single slit.   [12]

(P.T.O...)

5. What is polarization of transverse waves? Discuss polarization by reflection, refraction and scattering. [12]

6. What is the concept of special theory of relativity? Write its postulates. Explain length contraction and time dialation. [12]

7. Write short notes on: [6]

   (a) Biot-Savart's law

   (b) Gauss law in electrostatics. [6]

8. (a) What is photo electric effect? Discuss Einstein's photo electric effect. [6]

   (b) Discuss the application of Schrodingers Equation in case of potential step and potential barrier. [6]

$- x - x - x -$

GACR

+3, 1ˢᵗ SEMESTER EXAMINATION-2018 (SCIENCE)

Sub: BOTANY

Paper: CORE-II

Full Marks: 60

Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.

GROUP - A

1. **Write short notes on any SIX of the following. Each in 3 to 5 sentences.** [2x6]

   (a) Interphase

   (b) Lysosomes

   (c) Buffer solution

   (d) Energy Currency

   (e) Holoenzyme

   (f) Isoelectric point

   (g) Microtubules

   (h) Protein denaturation

GROUP-B

Answer any FOUR questions.

2. What are carbohydrates? Classify carbohydrates and mention their biological significances. [12]

3. Discuss the mechanism of enzyme action. [12]

4. Give an account of structure and function of plasma membrane. [12]

5. Discuss the organisation of nucleus with functions. [12]

(P.T.O...)

6. Describe the chromosomal behaviour during mitosis and write its significance. [12]

7. What do you mean by semiautonomus organelles? Discuss the structure and function of one semiautonomous organelle. [12]

8. Write the differences between prokaryotic and eukaryotic cells. Narrate the origin of eukaryotic cell. [12]

− *x* − *x* − *x* −

GACR

+3, 1st SEMESTER EXAMINATION-2018 (SCIENCE)

Sub: COMPUTER SCIENCE
Paper: CORE-II

Full Marks: 60
Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Section-A is compulsory. Answer any four from Section-B

SECTION-A

1. Answer any SIX questions.   [2x6]

(a) What is the significance of using cache memory?

(b) Convert $(1010101)_2$ into decimal.

(c) What is the work of shift register?

(d) Define Address Bus, Data Bus and Control Bus.

(e) Perform $(234)_{10} - (354)_{10}$ using 2's compliment.

(f) What is multiplexer?

(g) What is subroutine?

(h) Describe the term Relative Addressing.

SECTION-B

2. (a) Simplify $F(w, x, y, z) = \sum(0, 2, 5, 6, 7, 8, 10)$ in product of Sums.   [6]

(b) Draw a NAND logic diagram that implements the complement of the following function   [6]

$F(A, B, C, D) = \sum(0, 1, 2, 3, 4, 8, 9, 12)$

3. (a) Discuss the operation of full adder with circuit diagram and truth table   [6]

(P.T.O...)

(b) What is flip-flop. Describe the common types of flip-flops. [6]

4. (a) What are the various methods used to represent the signed numbers in computer memory? Explain. [6]

(b) Define Register, Register Transfer Language. Discuss about different Register Transfer Notations. [6]

5. (a) Write and describe Vector Dot Product Program and Byte Sorting Program. [6]

(b) Referring Power PC discuss about the different types of instructions. [6]

6. (a) Describe the internal organisation of a Memory Chip. [6]

(b) Differentiate different memory devices based on speed, size and cost. [6]

7. (a) Giving an example, show how Karnaugh maps are useful for minimisation. [6]

(b) Define Condition Code. Describe how it is used with example. [6]

8. Write short notes on (any THREE) [3x4]

(a) Field Programmable Gate Array

(b) RAMBUS Memory

(c) Finite State Machine

(d) Relative Addressing

- *x* - *x* - *x* -

GACR

+3, 1st SEMESTER EXAMINATION-2018 (SCIENCE)

Sub: ZOOLOGY

Paper: CORE-II

Full Marks: 60

Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

Give suitable labelled diagrams wherever necessary.

GROUP-A

1. Write short notes on any SIX of the following within two sentences.   [2x6]

   (i) What is synecology?

   (ii) Define limiting factor.

   (iii) What do you mean by protoco-operation?

   (iv) Define food chain.

   (v) What is red data book?

   (vi) What is ecotone?

   (vii) What is the status of Similipal from conservation of biodiversity point of view?

   (viii) What is IUCN stands for?

GROUP-B

Answer any FOUR of the following.

2. What is an ecological factor? Discuss it with respect to light.   [12x4]

3. Write notes on any TWO of the following

   (a) Relevance of ecology

   (b) History of ecology

   (c) Role of ZSI

(P.T.O...)

4.   Discuss various group attributes of a population.

5.   What is community? Elaboraate its charcteristic features.

6.   What is food chain? Discuss linear and Y-shaped food chains with suitable examples.

7. Write notes on any TWO of the following

   (a) Competition
   (b) Exponential growth
   (c) Xerarch

8.   Elaborate in-situ conservaton strategies.

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GACR

+3, 1st SEMESTER EXAMINATION-2018 (SCIENCE)

Sub: CHEMISTRY Full Marks: 60

Paper: CORE-II Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.

GROUP - A (Compulsory) [2x6]

1. Answer any SIX questions.

  (a) What information is given by the value of a and b in Van der Waal's equation of state?

  (b) Define the term critical temperature and pressure.

  (c) Why temperature of a boiling liquid does nor rise although heating is continued? Explain.

  (d) What is the pH of 0.1N sulphuric acid?

  (e) Why zinc oxide becomes yellow on heating?

  (f) Sodium metal crystallises with the cell edge a= 4.29 A. What is the radius of sodium atom?

  (g) Define ionic product of water.

  (h) Predict whether the following substances will give acidic, basic or neutral aqueous solutions.

  (i) Na_2CO_3 (ii) $FeCl_3$

GROUP - B
Answer any FOUR questions

2. (a) Give Maxwell's distribution of molecular veloocities. Sketch the distribution curve for two different temperatures and explain the effect of temperature on distribution of molecular velocities. [8]

(P.T.O...)

(b) Derive relationship between Cp and Cv. [4]

3 (a) Calculate the R.M.S. velocity of carbon dioxide at N.T.P. [4]

(b) Derive van der WAAL's equation for 1 mole of real gas. [8]

4. (a) What is solubility product and common ion effect? Discuss the application of solubility product and common ion effect in qualitative analysis. [10]

(b) Explain why drops of liquid are spherical in shape. [2]

5. Write notes on [4x3]

(a) Viscosity
(b) Surface tension
(c) Surface energy

6. (a) What is semiconductor? Explain about p and n-types of semiconductor. [2+6]

(b) What are different types of crystalline solid? Give one example of each. [4]

7. (a) Distinguish between Schottky defect and Frankel defect. [8]

(b) What is the number of particles per unit cell of a face centred and body centred cubic space lattice? [4]

8. (a) Derive Hendereson's equation for acidic and basic buffer mixtures. [10]

(b) Calculate the pH value of a solution obtained by ymixing 25 ml of 0.2 N HCl with 50 ml of 0.2 N NaOH. [2]

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GACR
+3 1ˢᵗ SEMESTER EXAMINATION - 2018
(ARTS)
SOCIOLOGY (CORE - II)

Time : 3 Hours   Full Marks : 80

Answer all Questions as per the instruction
The figure in the right hand margin indicate marks

GROUP - A

1. Answer any Eight of the following :   (2x8)

    a)   What is Communalism?

    b)   Write meaning of National Integration.

    c)   Explain the concept of Ashrama.

    d)   Who are twice - born?

    e)   Name some society where matriarchal system of family are found.

    f)   Mention aims of muslim marriage.

    g)   Write any two impact of caste on politics.

    h)   Highlight any two legal provisions for Schedule Tribes of India.

    i)   Write any two impact of modernization on Indian society.

    j)   Who hai coined the concep of Sanskritization?

GROUP - B
(Answer any Four of the following)

(16x4)

2.   Describe Religious composition of Indian Society.

3.   Discuss the factors of diversity in Indian Society.

P.T.O.

4.   Describe theory of Purushartha.

5.   Briefly describe various forms of Hindu Marriage.

6.   What is Dominant Caste? Discuss the factors which are responsible to make a caste to play it's dominant role.

7.   Examine the impact of westernization on Indian Society.

8.   Distinguish between caste and politics.

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GACR
+3, 1ˢᵗ SEMESTER EXAMINATION - 2018
(ARTS)
ODIA - Core - II

Time : 3 Hours   Full Marks : 80

Answer the Questions as per the instruction
The figure in the right hand margin indicate marks

('କ' ବିଭାଗ) (ବାଧ୍ୟତାମୂଳକ)   (୨×୧୦)

୧୦ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଗୋଟିଏ ବା ଦୁଇଟି ବାକ୍ୟରେ ଲେଖ ।

୧. (କ) ମଧ୍ୟଯୁଗ ଓଡ଼ିଆ ସାହିତ୍ୟର ଅନ୍ୟନାମ କାବ୍ୟଯୁଗ କାହିଁକି ?

(ଖ) ଉପେନ୍ଦ୍ର ଭଞ୍ଜଙ୍କ ସମକାଳୀନ ଓଡ଼ିଶାର ରାଜା କିଏ ଥିଲେ ?

(ଗ) ପ୍ରାକ୍-ରୀତି ଯୁଗୀୟ ଦୁଇଜଣ କାବ୍ୟକାରଙ୍କ ନାମ ଲେଖ ।

(ଘ) ପ୍ରଥମ ଓଡ଼ିଆ କାଳ୍ପନିକ କାବ୍ୟର ନାମ କ'ଣ ଓ ଏହାର କବି କିଏ ?

(ଙ) ଉପେନ୍ଦ୍ର ଭଞ୍ଜ ନିଜର କେଉଁ କାବ୍ୟକୁ 'ଘେନ ନୈଷଧ ପରାଜୟ' ବୋଲି ଉଲ୍ଲେଖ କରିଛନ୍ତି ?

(ଚ) ଝରୋଟି ପୌରାଣିକ କାବ୍ୟ ଓ କବିଙ୍କର ନାମ ଲେଖ ।

(ଛ) ଅଭିମନ୍ୟୁ ସାମନ୍ତ ସିଂହାରଙ୍କ ଦୀକ୍ଷାଗୁରୁ କିଏ ?

(ଜ) ବାକ୍ୟଂ ରସାମ୍କଂ କାବ୍ୟମ୍ – ଏ ଉକ୍ତିର ପ୍ରଣେତା କିଏ ?

(ଝ) ଅଳଙ୍କାର ଶାସ୍ତ୍ରରେ 'ବିପ୍ରଲମ୍ଭ ଶୃଙ୍ଗାର' କାହାକୁ କହନ୍ତି ?

(ଞ) 'ଛନ୍ଦ' ଓ 'ଛାନ୍ଦ' ମଧ୍ୟରେ ପାର୍ଥକ୍ୟ କ'ଣ ?

(ଟ) ଉଦାହରଣ ସହ ଚମ୍ପୁ କାହାକୁ କହନ୍ତି, ବୁଝାଇ ଦିଅ ।

(ଠ) 'ଚଉପଦୀ' କାହାକୁ କହନ୍ତି, ଉଦାହରଣ ଦିଅ ।

P.T.O.

'ଖ' ବିଭାଗ

(ସମସ୍ତ ଦୀର୍ଘ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ)

୨. ମଧ୍ୟଯୁଗୀୟ ଓଡ଼ିଆ ସାହିତ୍ୟର ପୃଷ୍ଠଭୂମି ବର୍ଣ୍ଣନା କର ।   (୧୨)

ଅଥବା

ମଧ୍ୟଯୁଗୀୟ ସାହିତ୍ୟର ବୈଚିତ୍ର୍ୟ ଦର୍ଶାଅ ।

୩. ଓଡ଼ିଆ କାଳ୍ପନିକ କାବ୍ୟ ପରମ୍ପରା ବିଷୟରେ ଚର୍ଚ୍ଚା କର ।   (୧୨)

ଅଥବା

ଓଡ଼ିଆ କୃଷ୍ଣକାବ୍ୟାବଳୀର ପରିଚୟ ଦିଅ ।

୪. ଆଲଙ୍କାରିକତା କାବ୍ୟଯୁଗର ଅନ୍ୟତମ ବୈଶିଷ୍ଟ୍ୟ – ଏହାର ସତ୍ୟତା   (୧୨)
ପ୍ରମାଣ କର ।

ଅଥବା

'ରୀତିରାମ୍ୟା କାବ୍ୟସ୍ୟ' – ମଧ୍ୟଯୁଗୀୟ କାବ୍ୟ ଆଧାରରେ ଏହାର
ଯଥାର୍ଥତା ଦର୍ଶାଅ ।

୫. ମଧ୍ୟଯୁଗୀୟ କାବ୍ୟ ସାହିତ୍ୟରେ ରସାନୁଭୂତିର ବିବିଧତା ଉଲ୍ଲେଖ କର ।   (୧୨)

ଅଥବା

ମଧ୍ୟଯୁଗୀୟ କାବ୍ୟର ଗଠନ କୌଶଳ ସମ୍ପର୍କରେ ଆଲୋଚନା କର ।

୬. ଏକ ସାର୍ଥକ ଚମ୍ପୂ ଭାବରେ 'କିଶୋର ଚନ୍ଦ୍ରାନନ୍ଦ ଚମ୍ପୂ'ର ମୂଲ୍ୟାୟନ   (୧୨)
କର ।

ଅଥବା

ଭଜନ ଓ ଜଣାଣ ମଧ୍ୟରେ ଥିବା ପାର୍ଥକ୍ୟ ଦର୍ଶାଅ । ଏ ଉଭୟ ଓଡ଼ିଆ
ମଧ୍ୟଯୁଗୀୟ ସାହିତ୍ୟକୁ କିପରି ରୁଦ୍ଧିମନ୍ତ କରିଛି, ପ୍ରମାଣ କର ।

GACR
+3 1st SEMESTER EXAMINATION - 2018
(ARTS)
POLITICAL SCIENCE (CORE - II)

Time : 3 Hours   Full Marks : 80

Answer all Questions as per the instruction
The figure in the right hand margin indicate marks

SECTION - A

1. Answer any Eight of the following :   (2x8)

    a) India is a republic.
    b) Two fundamental duties.
    c) Article - 19
    d) Uniform civil code.
    e) No - confidence motion.
    f) Article - 356.
    g) Schedule - 7.
    h) Union List.
    i) Role of BDO.
    j) Municipal Commissioner.

SECTION - B

Answer any Four

2. Discuss the salient features of the Indian   (16)
    Constitution.

OR

Critically analyse the Amendment procedure of the
Indian Constitution.

3. Fundamental Rights are neither fundamental nor   (16)
    rights. Examine.

P.T.O.

(2)

OR

Discuss the types and importance of the directive principles of State Policy.

4. Rajya Sabha is not only a Second Chamber but also a Secondary Chamber. Examine. (16)

OR

Discuss the Powers and Position of the Prime Minister.

5. Analyse the Judicial Review Power of the Supreme Court. (16)

OR

Discuss the Law making Power of the Parliament.

6. Discuss the financial relations between the Centre and States in India. (16)

OR

Examine the Emergency Provisions of the Indian Constitutions.

7. Discuss the Composition & functions of Gram Panchayat. (16)

OR

Discuss the Composition & functions of Municipal Corporation.

8. Analyse the Aims & objectives of Local Govt. (16)

OR

Discuss the position & future of Panchayati Raj System in India.

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GACR

+3, 1ˢᵗ SEMESTER END EXAMINATION-2018 (ARTS)

Sub.- English
PAPER : Core - II

Time: 3 Hours   Full Marks : 80

The figure in the right hand margin indicate marks.

Sec - 'A'   [4 x 6

Answer ALL questions

1. What does Milton meant by "two handed engine at the door"?

                                    OR

   Is 'Lycidas' merely a personal lament for a dead friend or poem of a greater significance?

2. What are Subtla and Face doing as the play 'The Alchemist' opens?

                                    OR

   What does Mammon want from the Doctor?

3. Write a short note on the character of "Alexes" in "All for love".

                                    OR

   Analyse the character of 'Octavia'.

4.   Analyse any ONE of follwing poem :-

   a)   Sound and Sense

   b)   My Heart's in the Highlands

   c)   A Red Red Rose

[P.T.O.]

Sec - 'B'

[14x4]

Answer ALL questions

1. In what way Milton's "Lycidas" is a pastoral elegy?

OR

Comment on Milton's attitude to the Church of England as reflected in Lycidas.

2. What is the theme of Love expressed in "All for Love"?

OR

"All for Love" an heroic tragedy. Discuss.

3. In "The Alchemist" Ben Jonson unshamedly satires the follies, varities and vices of mankind. Give your views.

OR

What is the 'Importance of money' in 'The Alchemist'.

4. Critically analyse any one of the following poems .

a) A winter night

b) Ode on solitude

c) A fond kiss.

d) The Dying Christain to his soul.

GACR
+3, 1ˢᵗ SEMESTER END EXAMINATION-2018 (ARTS)

Sub.- **Philosophy**
(PAPER : Core- II)

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.

Group - 'A'   [2x8]

1. Answer any EIGHT of the following.

    i)   What is the concept of science ?

    ii)   What does denotation imply?

    iii) How does ostensive definition differ from reportive definition.

    iv)   How does the meaning of a word become vague?

    v)   Distinguish between belief and faith?

    vi)   What is the meaning of a-priori?

    vii) "Mind is a clean state before experience" - Who has said this?

    viii) What is the difference between a law and a theory?

    ix)   What is logical possibility?

    x)   What is inductive leap?

Group - 'B' [16x 4]

Answer any FOUR questions.

2. State and explain the significance of ostensive definition. What are its limitations.

3. Discuss the different conditions of the meaninglessness of sentences.

4. Is vagueness a pervasive feature of language? Discuss.

5. State and explain experience as a source of knowledge.

6. What is a law of nature? Are laws of nature prescriptive or descriptive?

7. What is scientific explanation? Discuss.

8. Discuss the different kinds of possibility and impossibility.

■ ■ ■

GACR

+3, 1st SEMESTER END EXAMINATION-2018 (ARTS)

Sub.- **History**
PAPER : **Core - II**

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'   [2x8]

1.   Answer any EIGHT questions.

a)   Who is Charles Darwin and what was his book for Historical study?

b)   From which places the old stone age civilization had been discovered.

c)   In which civilization men could able to use the fire and the cooking process.

d)   When the men used the clay untensil and the use of wheel and to which civilization they belonged.

e)   In which civilization men could able to use the metals?

f)   In the new stone age what was the domestic animals.

g)   In which civilization the pyramid age started and who told that "Egypt" was the contribution of nite.

h)   What do you mean by the Pharo and Mammy.

i) What do you mean by Sphinx.?

j) Who complete the hanging garden of Babbilon and where it is situated?

k) Who was the first monach of Egypt?

Section - 'B'

[4x16

Answer any FOUR questions.

2. Discusss the main feature of Mesolethic age.

3. Discuss the cultural development of new stone age.

4. Discuss the development of animal Husbandry and the nomadic life during new stone age.

5. Discuss the development of art archetecture sclupture during Egypt civilization.

6. Describe the social life of the Egypt civilization.

7. Why the age of pericles is regarded as the golden age of Greek history?

8. Give an account of the advent of the iron and its implication.

GACR
+3, 1st SEMESTER EXAMINATION - 2018
(ARTS)
EDUCATION : Core - II

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.

(2x6=12)

1. Answer any *SIX* of the following:

   i.   Explain the characteristics of a society.

   ii.   What is meant by deschooling society?

   iii. What is cultural log?

   iv.   State the factors that can promote socialization
         of learnes.

   v.   What is social mobility?

   vi.   Explain the concept of globalisation and
         liberalization.

   vii. What are the basic principles of democracy?

   viii. What is meant by aotonomy in Education?

   Answer any Four of the following: (12x 4

2.   Define society. Describe its types.

3.   Critically examine the views of Dewey on
     education and society.

P.T.O.

4. What is culture? Throw light on the cultural dimensions of education.

5. Education is an instrument of social change. Discuss.

6. Discuss the educational system in SAARC countries.

7. Explain the special features of education in a totalitarian and welfare state.

8. Elaborate the interrelationship between state and education in the present Indian context.

□□□

GACR
+3, 1ˢᵗ SEMESTER END EXAMINATION-2018
(ARTS)
Sub.- **Psychology**
PAPER : Core - II

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'   [2x6]

1.   Answer any SIX objective type questions within
       three to four sentences each.

   a)   Multiple birth

   b)   Embryonic stage

   c)   Adolescent is the period of crisis.

   d)   Cepharlo - Caudal development

   e)   Rh - factors

   f)   Principle of centration

   g)   Sex and gender

   h)   Bereavement

[P.T.O.]

Group - 'B'   [12x4]

Answer any FOUR long type questions given below.

2.   What is development? Explain different factors influencing development.

3.   Discuss Humanistic perspectives of development.

4.   Highlight different stages of prenatal development.

5.   Narrate different social and emotional developments during adolescence.

6.   Substantiate Piaget's stage theory of cognitive development.

7.   Ilucidate the structure of self and indicate procedures of self control.

8.   Highlight different theories at aging.

■ ■ ■

GACR

+3, 1ˢᵗ SEMESTER EXAMINATION-2018 (COMMERCE)

Sub: Business Law   Full Marks: 80

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

Question No.1 is compulsory

1. **Write short notes on any EIGHT of the following.**   [2x8]

    (a) Contract

    (b) Contingent contraet

    (c) No Estoppel

    (d) Bailment

    (e) Factor agent

    (f) Contingent goods

    (g) Warranty

    (h) Dissolution of a partnership firm

    (i) Bill of Exchange

    (j) Holder-in-due course

Answer any FOUR questions

2. "No consideration no contract". Comment.   [16]

3. What do you mean by agreement opposed to public policy? Discuss the agreements which are against public policy.   [16]

4. What is baillment? Discuss the duties and right of the bailee.   [16]

(P.T.O...)

5. Who is an unpaid seller of goods? State and explain with example the rights of an unpaid seller against. [16]

   (a) the goods

   (b) the buyer's personally

6. Discuss the rights and liabilities the partners of a firm. [16]

7. Define a contract of sale and discuss the implied conditions in a contract of sale. [16]

8. Define a negotiable instrument. Discuss its characteristics and features. [16]

- *x* - *x* - *x* -

GACR
+3, 1st SEMESTER END EXAMINATION-2018 (ARTS)
Sub.- HINDI
PAPER : Core - II

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.

विभाग – क

1. निम्नलिखित प्रश्नों मे से किन्ही **आठ** प्रश्नों के संक्षिप्त उत्तर
    दीजिए।   [2x10]

क) "रमैनी" किस की रचना है ?

ख) दोहे की मात्राओं की संख्या कितनी है ?

ग) संसार को 'कागज पुड़िआ' कवीर ने क्यों कहा ?

घ) "पद्मावत" काव्य में नागमती किस की प्रतीक है ?

ङ) जायसी ने किस भाषा में 'पद्मावत' की रचना की ?

च) 'नागमती वियोग-वर्णन' का प्रारम्भ किस महीने से होता है ?

छ) 'अखराबट' किसकी रचना है ?

ज) राम के साकार रूप की उपासना किस कवि ने की ?

झ) रामचरितमानस की रचना कवि ने किस भाषा में की ?

ञ) 'रामचंद्रिका' किस कवि की रचना है ?

विभाग – ख

निम्नलिखित प्रश्नों मे से किन्ही **चार** प्रश्नों के उत्तर दीजिए।

2. संतकाव्य की प्रवृत्तियों की चर्चा कीजिए। [16

3. टिप्पणी लिखिए। [8 x 2

   i) कबीर के पद

   ii) प्रामाख्यान का स्वरूप

4. सुफी प्रेमाख्यान परंपरा की चर्चा कीजिए। [16

5. रामभक्ति काव्य की प्रवृत्तियों की विस्तृत चर्चा कीजिए। [16

6. ससंदर्भा व्याख्या कीजिए। [8 x 2

   i) सोना सज्जन साधुजन, टुटै जुरै सौ बार
      दुर्जन कुंभ कुम्हार के , एकै धका दरार ।।

   ii) गोधन, गजधन, बाजिधन और रतन धन मानी
      जब आवै संतोष धन सब धन धुरि समानि।।

7. संदर्भ के साथ व्याख्या कीजिए।

   i) बिरह हस्ति तन सालै खाइ करै तन पूर। [8 x 2
      वेगि आह पिय बाजहु गाजहु होइ सदूर ।।

   ii) प्रेम अमिअ मंदरु बिरहु भरतु पयोधि गंभीर।
      मयि प्रगटेउ सुर साधु हित कृपासिंधु रधुवीर ।।

7. 'नागमती वियोग-वर्णन' में जायसी ने परंपरागत प्रेम की विरह [16
   - भावना का चित्रण किस प्रकार किया है ? उल्लेख कीजिए।

GACR

+3, 1ˢᵗ SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: MTC   Full Marks: 80

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Answer any EIGHT questions from Q. No.1 and

any FOUR from the rest.

1. (a) represent $3 + 4i$ in polar from   [2x8]

   (b) State De-Moivre's theorem

   (c) Define equivalence relation with example.

   (d) If $f(x) = \dfrac{2-x}{3-x}$ and $g(n) = \dfrac{3}{x-1}$ then find $fog\,(x)$ and

   $gof\,(x)$

   (e) Test the linear independency of the vector $(2, 3)$ &
   $(22, 33)$.

   (f) Find the inverse of $\begin{pmatrix} 1 & 3 \\ 1 & 2 \end{pmatrix}$

   (g) Find the rank of the matrix $\begin{pmatrix} 1 & 1 \\ 3 & 3 \end{pmatrix}$

   (h) Define characteristic equation of matrix

   (i) Write down all fourth roots of unity.

   (j) Define subspace of a vector space.

(P.T.O...)

2. (a) Find the value of following $(1 + w)(1+w^2)(1+w^4)... 2n$ factor=? [8]

   (b) Find all 5 roots of $z = 1 - i$ [8]

3. (a) Prove that the relation R: A $\rightarrow$ A defined as R = {(a,b): a & b share common parents} over the set A = set of all humnas is not an equixalence relation. [8]

   (b) Prove that 3 divides n^3+2n using mathematical induction for +ve integer n. [8]

4. (a) Use Gauss-elimination method to solve [8]

   $2x - y + 2z = 3$
   $x + 2y - 3z = 0$
   $x + y + 2z = 4$

   (b) Use Jacobi's mthod to solve [8]

   $20x + y - 3z = 18$
   $3x - 3y + 20z = 20$
   $x + 20y + z = 22$

5. (a) Find the inverse of the matrix $\begin{pmatrix} 2 & 1 & 3 \\ 1 & 2 & 1 \\ 3 & -1 & 1 \end{pmatrix}$. [8]

   (b) Prove that $1+\dfrac{1}{4}+\dfrac{1}{9}+....+\dfrac{1}{n^2} < 2 - \dfrac{1}{n}$ using mathematical equation. [8]

6. (a) State and prove Euclidean algorithm. [8]

   (b) Find the eigen values of the matrix $\begin{pmatrix} -10 & 10 & -15 \\ 10 & 5 & -30 \\ -5 & -10 & 0 \end{pmatrix}$ [8]

7. (a) Find the eigen vectors of the matrix $\begin{pmatrix} 10 & -4 \\ 18 & -12 \end{pmatrix}$. [8]

   (b) Find the rank of the matrix $\begin{pmatrix} 3 & 1 & 2 & 2 \\ 1 & 3 & 1 & -2 \\ 4 & 4 & 3 & 0 \\ 3 & 1 & 2 & 2 \end{pmatrix}$. [8]

8. (a) Test the linear dependency of the vectors $(1, 9, 9, 3)$, $(2\ 0\ 0\ 9)$, $(2\ 0\ 1\ 2)$. [8]

   (b) State fundamental theorem of Arithmetic and apply it to an example. [8]

$- x - x - x -$

GACR

+3, 1st SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: PHYSICS   Full Marks: 60

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.

1. Answer any Ten questions.   [2x10]

(a) Show that $\vec{\tau} = \dfrac{d\vec{L}}{dt}$.

(b) State theorem of parallell axes for moment of inertia.

(c) Distinguish inertial and non-inertial frame of references.

(d) What are the limiting values of poisson's ratio?

(e) What is radius of Gyration?

(f) What are uses of GPS?

(g) State Hooke's law of elasticity.

(h) What do you mean by weightlessness?

(i) What is the meaning of sharpness of resonance?

(j) Find momentum of photon of energy 5ev.

(k) Length of a rocket is 10m on the ground. When it is in flight its length observed is 5m. Find its speed.

(l) What is forced oscillation?

(m) What do you mean by mass less particles?

2. Calculate moment of inertia of a solid sphere about   [4+4]
    its diameter and about the tangent.

(P.T.O...)

OR

Define angular momentum of a particle and then find the angular momentum of system of particles. Show that the total angular momentum is conserved for an isolated system of particles. [2+3+3]

3. A reference frams 'a' rotates with respect to another reference frame 'b' with angular valocity $\vec{w}$. If the position, velocity and acceleratioin of the particle in frame 'a' is $\vec{r}$, $V_{\bar{a}}$ and $a_{\bar{a}}$ respectively, then derive the expression for acceleration of particle in frame 'b'. From it, define coriolis and centripetal acceleration. [6+2]

OR

Deduce the relation among the Elastic constants [8]

Y - young's modulus

K - Bulk modulus

m - modulus of rigidity

σ - possion's ratio

4. Find the gravitational potential and field intensity due to a thin spherical shelll at a point in side and out side of shell. [4+4]

OR

State and prove Kepler's laws of planentary motion. [2+6]

5. Define SHM. Obtain a differential equation for it and solve the differential equation. Show that time average of K.E. is same as time average of P.E. [1+2+2+3]

OR

What is damped vibration? Establish the differential equation for damped harmonic oscillations and obtain its solution. Discuss the case of critical damping. [1+3+3+1]

6. Describe Michelson - Moreley experiment what do you conclude from it? If ether does not exist, in what medium does light travel? [5+2+1]

OR

State postalates of special theory of relativity. Derive Lorentz transformation equation for two inertial fframe of references. Show that these transformation equations are reduced to Galileon transformation when V<<C. [2+5+1]

$-x-x-x-$

GACR

+3, 1st SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: STATISTICS   Full Marks: 60

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

GROUP-A

1. (a) If the two lines of regression are coincident, the relaton between regression coefficient is _____.   [2x6]

(b) The signature property is regression means that the signs of βxy, βyx and γ are _____.

(c) If two lines of regression are $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$, the regresson line of Y on X is _____.

(d) What do you mean by intraclass correlation.

(e) State mean value theorem.

(f) Evaluate $\displaystyle\lim_{x \to \infty} \frac{4x^3 + 2x^2 + 5x + 2}{2x^2 + 5x + 3}$

(g) State any one condition of discontinue.

(h) Evaluate $\int e^x \sqrt{(e^x + 1)} \, dx$

GROUP-B
Answer any FOUR of the following.

2. Derive the least square equation for fitting curve of the type (i) $y = ax + \dfrac{b}{x}$ (ii) $y = ax^b$ [12]

3. (a) If x_1, x_2, x_3 be uncorrelated variables each having some standard deviation, obtain the correlation coefficient betweeen $x_1 + x_2$ and $x_2 + x_3$ [6+6]

(b) The rank correlation coefficient between X and Y is 0.8 and $\sum d^2 = 33$. Find number of observation.

4. (a) Write short notes on correlation ratio.   [6+6]

(b) Briefly explain intra class correlation and also explain its uses.

5. What do you mean by regression? Explain its mathematical properties and its uses.   [12]

6. (a) Examine the continuity of the following function at $x=4$.   [12]

$$f(x) = \begin{bmatrix} \dfrac{x^2 - 16}{x - 4}, & when\ x \neq 4 \\ 8, & when\ x = 4 \end{bmatrix}$$

(b) Find maximum and minimmum value of the function

$$f(x) = \frac{2}{3}x^3 + \frac{1}{2}x^2 - 6x + 8.$$

(c) if $y = \log(x \cos x)$, Find $\dfrac{dy}{dx}$

7. (a) Find first and second order partial derivative of $\log(x^2 + y^2)$ [12]

(b) Find $\dfrac{d^2u}{dx^2}, \dfrac{d^2u}{dx\,dy}, \dfrac{d^2u}{dy\,dx}, \dfrac{d^2u}{dy^2}$ for the function $u = x^2 y^2$

8. (a) $\displaystyle\int \frac{8x^2}{(x^3 + 2)^3}\,dx$ [12]

(b) $\displaystyle\int x^2 . e^{3x}\,dx$

(c) $\displaystyle\int \sqrt{\frac{3 - x}{x - 2}}\,dx$

9. (a) $\displaystyle\int_0^{\pi/2} \sin 2x \log(\tan x)\,dx$ [12]

(b) $\displaystyle\int_0^{1/2} \frac{x}{x + \sqrt{1 + x^2}}\,dx$

$- x - x - x -$

GACR

+3, 1ˢᵗ SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: MATHEMATICS   Full Marks: 80

Paper: CORE-II   Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Answer any EIGHT questions from Q. No.1 and
any FOUR from the rest.

1. Answer any EIGHT of the following.   [2x8]

(a) Find the polar representation of i.

(b) If $f(x) = \dfrac{1}{x}$, $g(x) = \dfrac{x}{x+2}$ then find gof (x)

(c) Find the value of $\sqrt{1+i}$ = ?

(d) Define transitive relation with example.

(e) If $A = \begin{pmatrix} 2 & 1 \\ 1 & 3 \end{pmatrix}$ & $B = \begin{pmatrix} 1 & 2 \\ 1 & 1 \end{pmatrix}$ then find $(AB)^T$.

(f) Find the characteristic equation for $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$.

(g) Test the linear independency of (2, 1, 1), (1, 1, 2), (3, 3, 3).

(h) Find the inverse of the matrix $\begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix}$

(i) Find the eigen values of $\begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$

(j) Define congruence modulo relation.   (P.T.O...)

2. (a) For any two complex numbers z_1 & z_2 prove that [8]
arg$(z_1 | z_2)$ arg z_1 - arg.z_2.

(b) If R: $\mathbb{Z} \to \mathbb{Z}$ defined as [8]

R = { (a,b) : a + b is an even integer} then prove that R is an eequivalence relation.

3. (a) Find all six roots of 1+ i. [8]

(b) Prove the following using mathematical induction [8]
$2^n < n!$ for n $\geq$ 4.

4. (a) State and prove Division algorithm. [8]

(b) Define linear indepent. Test the linear dependency of [8]
(2, 1, 1, 4), (1, 3, 2, 1) & (1, -2, -1, 3)

5. (a) Use matrix inversion method to solve [8]

$2x + 2y - z = 3$
$-x + y + 2z = 2$
$2x - 2y + z = 1$

(b) Reduce the matrix $\begin{pmatrix} 2 & 1 & 2 & 3 \\ 1 & 3 & 2 & 2 \\ 3 & 2 & 4 & -1 \end{pmatrix}$ into row-reduced [8]

echelon from.

6. (a) Find the rank of the matrix $\begin{pmatrix} 2 & 1 & 3 & 5 & 2 \\ 1 & 3 & 2 & 1 & 4 \\ 1 & -2 & 1 & 4 & -2 \end{pmatrix}$ [8]

(b) Find the eigen values of the matrix $\begin{pmatrix} 2 & 1 & 3 \\ 0 & 3 & 2 \\ 0 & 0 & 4 \end{pmatrix}$ [8]

7. (a) Find the eigen vectors of the matrix $\begin{pmatrix} 10 & -4 \\ 18 & -12 \end{pmatrix}$ [8]

(b) If $A = \begin{pmatrix} 1 & 3 \\ 1 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 5 \\ 3 & 2 \end{pmatrix}$ then find $A^2 - AB$. [8]

8. Write short notes on (any two) [8+8]

(a) Linear Transformation

(b) Euclidean Algorithm

(c) Equivalence Class

(d) Dimension of subspace of R^n.

- x - x - x -

GACR
+3 1ˢᵗ SEMESTER EXAMINATION - 2018
(ARTS)
ECONOMICS (CORE - II)

Time : 2 Hours   Full Marks : 80

Answer all Questions as per the instruction
The figure in the right hand margin indicate marks

1. Answer any Eight of the following :   (16)
   a. What do you mean by proper subset? Give an example.
   b. What do you mean by equivalence relations? Give an example.
   c. Evaluate $\underset{X \to \infty}{\text{Lt}} \dfrac{4x^2 + 5x + 6}{3x^2 + 4x + 6}$
   d. If $y = (3x^3 - 5x^2 + 8)^3$, find dy/dx
   e. If $f(x) = x2$, find range
   f. What do you mean by symmetric matrices? Give an example.
   g. What do you mean by rank of matrix.
   h. Find the value of $7 \log (16 / 15) + 5 \log (25 / 24) + 3 \log (81 / 80)$
   i) State limit theorm.
   j) What do you mean by partial elasticity.

2. a) A Company studies the Product Preferences of 20,000 consumers. It was found that each of the products A, B, C was liked by 7020, 6230 and 5980   (8+8)

respectively and all the products were liked by 1500, product A and B were liked by 2580, product A and C were liked by 1200 and product B and C were liked by 1950. Prove that the study results are not correct.

b) Explain different types of functions with giving suitable example.

3. a) If F(x) = 4x, prove that $F(x+2) - F(x-1) = \dfrac{63}{4} . F(x)$ **(16)**

b) Evaluate, $\displaystyle\underset{x\to a}{Lt}\ \dfrac{\sqrt{x}-\sqrt{a}}{x-a}$

c) Examine continuity of $F(x) = x^2 + 2$, at $x = 2$

d) Define domain and range of a function.

4. a) Find $\dfrac{dy}{dx}$, if $y = x^x$ **(5+5+6)**

b) Differntiate $\sqrt{3x^2 - 7}$ w.r.t.x.

c) Test the continuity of the function

$$F(x) = \begin{cases} A\begin{pmatrix} 6 & 1 & 3 & 8 \\ 4 & 2 & 6 & -1 \\ 103 & 9 & 7 \\ 16 & 4 & 12 & 15 \end{pmatrix}, & \text{When } x \neq 4 \\ 8, & \text{When } x = 4 \end{cases}$$

5. (a) Find the first order partial derivative of $x^2 + 6xy + y^2$ = 0 **(8+8)**

(b) If T.C. = $\dfrac{2}{3}x + \dfrac{35}{2}$

(i) Find total cost when x = 4 units

(ii) Find average cost when x = 10 units

(iii) Find marginal cost when x = 3 units.

6. If A -1 = $\dfrac{1}{25}\begin{pmatrix} 25 & -10 & -15 \\ -10 & 4 & 11 \\ -15 & 1 & 9 \end{pmatrix}$, *Find A* **(16)**

7. a) Find the rank of matrix **(8+8)**

$$A\begin{pmatrix} 6 & 1 & 3 & 8 \\ 4 & 2 & 6 & -1 \\ 103 & 9 & 7 \\ 16 & 4 & 12 & 15 \end{pmatrix}$$

b) Solve the following equation using determinant.
x + y + z = 7
x + 2y = 3z = 16
x + 3y + 4z = 22

8. a) If the demand law is given by show that the total revenue increases while marginal revenue decreases continuously as output increases. **(8+8)**

b) Explain properties of determinants.

◆ ◆ ◆