No. of Pages: 2

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?

[P.T.O.]

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।

   i) सोना सज्जन साधुजन, टुटै जुरै सौ बार [8 x 2
   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।

■■■

No. of Pages: 2

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.

■■■

No. of Pages: 2

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.

■■■

No. of Pages: 2

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]

-x-x-x-

No. of Pages: 2

GACR

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

Sub: BOTANY 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. 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-

No of Pages : 2

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 Constitution. (16)

OR

Critically analyse the Amendment procedure of the Indian Constitution.

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

P.T.O.

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.

◆◆◆

No. of Pages: 3

GACR

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

Sub: PHYSICS
Paper: CORE-II

Full Marks: 60
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 $\vec{\tau} = \frac{d\vec{L}}{dt}$.

(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 f light 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 its diameter and about the tangent. [4+4]

(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 $\vec{r}$, $V_{\vec{a}}$ and $a_{\vec{a}}$ 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 -

No. of Pages: 3

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 $f(x) = \frac{1}{x}$, $g(x) = \frac{x}{x+2}$ 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 $\arg(z_1 \mid z_2) \arg z_1 - \arg.z_2$. [8]

   (b) If R: $\mathbb{Z} \rightarrow \mathbb{Z}$ 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 -

No. of Pages: 3

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 $f(x) = \frac{2+x}{3-x}$ and $g(n) = \frac{3}{x-1}$ 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 $(1 + w)(1+w^2)(1+w^4)\ldots 2n$ factor=? [8]

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

3. (a) Prove that the relation R: A → 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 $1+\frac{1}{4}+\frac{1}{9}+\ldots.+\frac{1}{n^2}<2-\frac{1}{n}$ 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 -

No of Pages : 2

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 Lt $\frac{4x^2 + 5x + 6}{3x^2 + 4x + 6}$ $X \to \infty$
   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)

P.T.O.

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 $F(x+2) - F(x-1) = \frac{63}{4}. F(x)$ (16)

b) Evaluate, $\lim_{x \to a} \frac{\sqrt{x} - \sqrt{a}}{x - a}$

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

d) Define domain and range of a function.

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

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

c) Test the continuity of the function

$$F(x) = \begin{cases} A\begin{pmatrix} 6 & 1 & 3 & 8 \\ 4 & 2 & 6 & -1 \\ 10 & 3 & 9 & 7 \\ 16 & 4 & 12 & 15 \end{pmatrix}, & \text{When } x \neq 4 \\ 8, & \text{When } x = 4 \end{cases}$$

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

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

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

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

$$A\begin{pmatrix} 6 & 1 & 3 & 8 \\ 4 & 2 & 6 & -1 \\ 10 & 3 & 9 & 7 \\ 16 & 4 & 12 & 15 \end{pmatrix}$$

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 (8+8)
show that the total revenue increases while marginal revenue decreases continuously as output increases.

b) Explain properties of determinants.

◆◆◆