No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(COMMERCE)

Sub.- HRM

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.

1. Answer any EIGHT of the following. [2 x 8

i) Define HRM. What are the objectives of HRM?

ii) Distinguish between job description and job specification.

iii) What is job Evaluation?

iv) What are the major bases of promotion?

v) What is fringe benefits?

vi) Differentiate Recruitment & Solution.

vii) Define Human Resource Information system.

viii) What do you mean by compensation

ix) What are the causes of Industrial dispute?
(Give any two causes)

x) Distinguish between Training and Development.

Answer any FOUR questions.

2. a) Explain the internal and external sources of Recruitment. [8

b) State the importance of interview in selection process. [8

P.T.O.

3.		Discuss the managerial and operative functions of HRM.	[16
4.		What is performance appraisal? Explain the Modern Techniques of Performance Appraisal.	[16
5.	a)	Write notes on Management Development.	[8
	b)	State the importance of career Develeopment.	[8
6.		Define industrial dispute. Outline Dispute settlement Machinery.	[16
7.		What do you understand by employee compensation? Describe various methods of wage payment and incentive plans.	[4+12
8.	a)	Write notes on empowerment.	[8
	b)	State the importance of workforce Diversity.	[8

■■■

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)
SOCIOLOGY (CORE-VII)

Time: 3 Hours | Full Marks: 80

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

GROUP-A [2x8]

1. Answer any EIGHT of the following.

(a) What is Rural Sociology?

(b) Write any two contrast between Rurall and Urban community.

(c) Mention any two changes in Rural caste structure.

(d) Write any two causes of Landlessness.

(e) What is Democratic decentralization?

(f) Write any two objectives of Indira Aawas Yojana.

(g) Mention any two salient features of Green Revolution in Indian context.

(h) Write any two objectives of National Rural Health Mission.

(i) Give any two suggestions to solve the problems of Indebtedness.

(j) What is MGNREGA?

GROUP-B

Answer any FOUR of the followings. [16x4]

2. Discuss the nature of Rural Sociology.

(P.T.O...)

3. Write briefly Rural-Urban contract and continuum.

4. 'Poverty and Unemployment in Rural society is interconnected'. Explain.

5. What are the causes of failure of co-operative movement in India?

6. Discuss the problems of Panchayati Raj Institutions in the Indian context.

7. Describe the objectives and the extent of achievement of SGSY.

8. What are causes of Rural Migration?

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)

Sub: PSYCHOLOGY Full Marks: 60

Paper: CORE-VII Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

GROUP-A (Compulsory)

1. Answer any SIX objective type questions given below within three to four sentences each. [2x6]

(a) What is gaia principle?

(b) Biodiversity.

(c) Environmental consciousness

(d) Flora and Fauna

(e) Place identity

(f) Enculturation and acculturation

(g) Chipko movement

(h) Crowding effect

GROUP-B

Answer any FOUR long tpe questions given below. [12x4]

2. Describe different principles of deep ecology.
3. Discuss different aspects of man environment relationship.
4. Explain different environmental hazards.
5. Ilucidate the phenomena of acculturation and psychological adaptation in the context of ecology.

(P.T.O...)

6. Briefly narrate person environment transaction approach to environment.
7. Explain the effect of natural and man made disasters on environment and human behaviour.
8. Highlight few strategies to promote pro-environmental behaviour.

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)

Sub: POL. SCIENCE Full Marks: 80

Paper: CORE-VII Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

SECTION-A (Compulsory)

[2x8]

1. Answer any 8 of the following questions within two sentences each.

(a) What is International state system?

(b) What is treaty of Westphalia?

(c) What is New-realism in International Relation?

(d) Write one major cause of World War 1.

(e) Where did Bolshevik Revolution occur and when?

(f) What is New cold war?

(g) What is multi-polarity in global politics?

(h) What is Nazism?

(i) What is Warsaw Treaty?

(j) What is North-south divide in international politics?

SECTION-B

[16x4]

Answer any FOUR of the followings.

2. Discuss the features of Post-westphalian state system.

3. Critically examine the Marxist approach to international relations and its relevance today.

4. Eurocentrism is no longer the dominant discourse in the international relations. Discuss.

(P.T.O...)

5. Discuss the impact of Bolshevik Revolution in changing the course of international relation.

6. Analyse the causes of the rise of Fascism and its impact.

7. Discuss the different phases of Cold War.

8. Discuss Globalisation and its impact on changing international relation.

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(ARTS)

Sub.- Philosophy

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.

Group - 'A'

[2x8]

1. Answer any EIGHT of the following.
   i) What is the teleological argument for existence of God.
   ii) What is Bacon's idola of Tribes?
   iii) What are the two ulitmate substances according to Descartes?
   iv) What is a simple idea according to Locke?
   v) What is the meaning of an innate idea?
   vi) Who are the two great propounders of modern empiricism?
   vii) What is the meaning of aposteri?
   viii) What is the substratum according to Locke?
   ix) How is idealism differs from realism?
   x) What is interactionism of Descartes?

[P.T.O.]

Group - 'B'

[16x 4]

Answer any FOUR questions.

2. Explain the cosmological and teleological arguments for existence of God after Aquinas.
3. Idolas are obstacles to valid knowledge -Discuss after Bacon.
4. State and explain Descartes universal doubt.
5. Give a brief exposition of Locke's theory of knowledge.
6. Explain Locke's refutation of innate ideas.
7. Discuss Berkeleys subjective idealism in brief.
8. Why is Descartes considered to be father of modern European Philosophy? Discuss.

■■■

No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(ARTS)

Sub.- History

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.

1. Answer any EIGHT of the following. [2 x 8

   i) Give the name of vernacular histories. (any two)

   ii) What do you mean by epigraph.

   iii) Who was the founder of the Khilji dynasty.

   iv) Which Sultan shifted the capital from Delhi to Daulatabad.

   v) Who were the Ulemas?

   vi) Who was the founder of the Vijayanagar Kingdom?

   vii) Define an Iqta.

   viii) Name two urban centres during the Sultanate period.

   ix) What was Jizya?

   x) Nanak's teachings were compiled in which book?

[P.T.O.]

Answer any FOUR questions. [16x 4]

2. Briefly describe the main sources to reconstruct the history of the Delhi Sultanate.
3. Briefly describe the economic policy of Allauddin Khilji.
4. Briefly describe about the regional art and architecture during the Sultanate period.
5. Discuss about the revenue system during the Sultanate period.
6. Give an account of the society during the Sultanate period.
7. Briefly discuss the causes and impact of Bhakti movement in India.
8. Discuss about the Sufi literature.

■■■

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)

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

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

କ - ବିଭାଗ (ବାଧ୍ୟତା ମୂଳକ)

୧. ଯେକୌଣସି ୮ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ । (୨×୮)

(କ) ପ୍ରହଲ୍ଲାଦ ନାଟକ କେଉଁ ଅଞ୍ଚଳର ଲୋକନୃତ୍ୟ ?

(ଖ) ଚଇତି ଘୋଡ଼ାନାଚ କେଉଁ ସମ୍ପ୍ରଦାୟର ଲୋକନୃତ୍ୟ ?

(ଗ) ରୂପକ ଗଳ୍ପକୁ ଇଂରାଜୀରେ କଣ କୁହାଯାଏ ?

(ଘ) ପ୍ରବାଦ ଓ ପ୍ରବଚନ ମଧ୍ୟରେ ଥିବା ପାର୍ଥକ୍ୟ କଣ ?

(ଙ) କେଉଁ ଲୋକ ଗଳ୍ପ ଗାଲ ଗଳ୍ପ ପର୍ଯ୍ୟାୟରେ ଅନ୍ତର୍ଭୁକ୍ତ ?

(ଚ) ପ୍ରହେଳିକା କାହାକୁ କହନ୍ତି ?

(ଛ) ନାଁ ଦିଆ ଲୋକ ସାହିତ୍ୟର କେଉଁ ବିଭାଗର ଅନ୍ତର୍ଭୁକ୍ତ ?

(ଜ) ପଲ୍ଲୀଗୀତ ସଞ୍ଚୟନ ପୁସ୍ତକର ରଚୟିତା କିଏ ?

(ଝ) ଲୋକ ସାହିତ୍ୟର ୨ଜଣ ବିଶିଷ୍ଟ ସଂଗ୍ରାହକଙ୍କ ନାମ ଲେଖ ?

(ଞ) କୃଷି ଭିତ୍ତିକ ୨ଗୋଟି ପ୍ରବଚନର ଉଦାହରଣ ଦିଅ ।

ଖ- ବିଭାଗ

ଯେକୌଣସି ୪ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ । (୧୬×୪)

୨. ଲୋକ ସାହିତ୍ୟର ସ୍ୱରୂପ ଉଲ୍ଲେଖ ସହ ଓଡ଼ିଆ ସଂସ୍କୃତିର ଯଥାର୍ଥ ପରିଚୟ ଏଥିରେ କିପରି ନିହିତ ଦର୍ଶାଅ ।

(P.T.O...)

୩. ଓଡ଼ିଆ ଲୋକ ଗୀତରେ ନାରୀ ହୃଦୟର ଆବେଗ ଓ ମୂର୍ଚ୍ଛନା କିପରି ରୂପାୟିତ ହୋଇଥାଏ ପ୍ରତିପାଦନ କର।

୪. ଓଡ଼ିଆ ଲୋକ କାହାଣୀର ସ୍ୱରୂପ ନିର୍ଦ୍ଧାରଣ କରି ମନୋରଞ୍ଜନ ଓ ସାହିତ୍ୟ ସୃଷ୍ଟିପାଇଁ ଏହା କେତେ ଦୂର ସମର୍ଥ ଆଲୋଚନା କର।

୫. ଓଡ଼ିଆ ଲୋକ ନାଟକର ସାଧାରଣ ବୈଶିଷ୍ଟ୍ୟ ଉଲ୍ଲେଖକରି ଶିକ୍ଷା ଓ ମନୋରଞ୍ଜନ ରେ ଏହାର ଭୂମିକା ପ୍ରଦର୍ଶନ କର।

୬. ପ୍ରବାଦ ଓ ପ୍ରବଚନରେ ଜନ ଜୀବନର ଅନୁଭୁତି କିପରି ରୂପାୟିତ ଦର୍ଶାଅ।

୭. ଓଷା ବ୍ରତର ଉଦ୍ଦେଶ୍ୟ ଦର୍ଶାଇ ଲୋକ ସଂସ୍କୃତିରେ ଏହାର ପ୍ରତିଫଳନ ସମ୍ପର୍କରେ ବିଚାର ବିମର୍ଶ କର।

୮. ଓଡ଼ିଆ ପ୍ରବାଦ ପ୍ରବଚନରେ ପ୍ରତିଫଳିତ କୃଷି ଓ କୃଷକର ଚିତ୍ର ପ୍ରତିପାଦନ କର।

- x - x - x -

No. of Pages: 3

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)

Sub: HINDI Full Marks: 80

Paper: CORE-VII Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Answer any FIVE including Q.1.

१. किन्हीं आठ प्रश्नों के संक्षिप्त उत्तर दीजिए। [2x8]

(क) किसने किससे क्या कहा था?

(ख) फिरंगियों का तंबु किस बातका प्रतीक है?

(ग) क्या पुरस्कार का शीर्षक सही है?

(घ) वापसी का नायक कौन है?

(ङ) 'रानी माँ का चबुतरा' कहानी के लेखक कौन हैं?

(च) पुस की रात में किसकी कथा कही गई है?

(छ) कलाकार किस कला का प्रदर्शन करता है?

(ज) रेणु की ' पंचलाईट' कहानी की एक विशेषता लिखिए।

(झ) परसाई जी की कहानी में मुख्य तत्व क्या है?

(ञ) मानसरोवर के हंस कौन हैं?

किन्हीं चार प्रश्नों के उत्तर दीजिए [16x4]

२. प्रेमचंद की दृष्टी व्यक्ती द्वन्द की और कम समष्टी की मुल्यों की और अधिक थी - ' पुस की रात' के आधार पर स्पष्ट कीजिए।

३. 'पुरस्कार' कहानी के आधार पर मधुलिका का चरित्र चित्रण कीजिए।

(P.T.O...)

४. भोलाराम का जीव कौन है और वह क्या संदेश देता है?

५. 'मान सरोबर' के हंस कहानी की प्रतीक योजना की स्पष्ट कीजिए।

६. 'वापसी' कहानी की करुणा की व्याख्या कीजिए।

७. लहनासिंह के त्याग भावना को लेखक ने कैसे परिस्फुट किया है - समझाइए।

८. 'मुगलों ने सल्तनत बख्श दी' कहानी की व्यांख्या को स्पष्ट कीजिए।

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(ARTS)

EDUCATION (Hons: C-VII)

Time: 3 Hours | Full Marks: 60

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

1. Answer any SIX of the following: [2x6]

(i) What is inferential statistics?

(ii) How is interval scale different from ratio scale?

(iii) What is Pie-diagram?

(iv) What is average deviation?

(v) What is Non-linear correlation?

(vi) Why is product moment correlation called so?

(vii) What is meant by Chi-square test?

(viii) Why is t-test used?

Answer any FOUR of the following.

2. Define statistics. Discuss its characteristics. [3+9]

3. Discuss in brief the measures of central tendency. [12]

4. What is NPC? Write its characteristics. [3+9]

5. Calculate standard deviation of the following distribution. [12]

SCORES	FREQUENCY
70 - 74	1
65 - 69	4
60 - 64	4

(P.T.O...)

55 - 59	8
50 - 54	7
45 - 49	6
40 - 44	6
35 - 39	4
	=======
	N = 40

6. Write the procedure of drawing a cumulative percentage curve/ogive from the above frequency distribution. [12]

7. Compute the co-efficient of correlation of the following two sets of scores by Rank difference method. [12]

Students	A	B	C	D	E	F	G	H	I	J
Math	40	36	55	62	60	72	65	25	16	35
Science	25	40	62	80	65	81	82	55	45	54

8. Test the divergence of observed results from the expected ones on the hypothesis of equal probability from the data given below. [12]

Category	Observed frequency
A	23
B	18
C	24
D	17
E	18

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(ARTS)

ENGLISH (Hons: C-VII)

Time: 3 Hours | Full Marks: 80

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

GROUP-A [2x8]

1. Answer any EIGHT of the following:

(i) What is American literature?

(ii) What is the American Dream?

(iii) Who is Harriet Jacobs?

(iv) What is the theme of *Walden?*

(v) Who is John Claggart?

(vi) State the theme of "Success is counted sweetest".

(vii) State the theme of "Fire and Ice".

(viii) What is the main concern of the speaker in "disillusionment of Ten O' clock"?

(ix) Why is *Desire Under the Elms* called a tradegy?

(x) Write a short note on Clay.

GROUP-B

Answer any FOUR of the following. [16 x 4]

2. Discuss the features of 20th century American literature.

3. Critically appreciate "A Noiseless Patient Spider".

4. Critically appreciate "The Road Not Taken".

(P.T.O...)

5. Discuss the theme of *Billy Budd.*

6. Sketch the character of Ephraim Cabot.

7. Discuss the theme of *Dutchman.*

8. Answer any four of the following:

(a) write a short note on American Renaissance.

(b) State the theme of "The Pond in Winter".

(c) Write a short note on Captain Vere.

(d) Annotate the extract:

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I -
I took the one less travelled by,
And that has made all the difference.

(e) Annotate the extract:

Among twenty snowy mountans,
The only moving thing
Was the eye of the blackbird

(f) What is significance of the title *Desire Under the Elms*?

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(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.

Group -A (Compulsory)

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

(a) Write the Clausius-Clapeyron equation

(b) Define eutectic point.

(c) What do you mean by congruent and incongruent melting point of a compound?

(d) Give an example of a zero order reaction. What is the unit of the rate constant of a zero order reaction?

(e) What are two types of two-component system involving solid-liquid equilibria? Give one example of each.

(f) A catalyst is specifix in it's reaction. Explain with examples.

(g) What do you mean by acid-base catalysis? Give an example.

(h) Calculate the activation energy of a reaction whose reaction rate at 27^0C gets doubled for 10^0C rise of temperature.

GROUP - B

Answer any FOUR questions.

2. (a) Define the term phase and degree of freedom. Calculate the number of phases and component in [4]

$NH_4Cl(s) \rightleftharpoons NH_3(g) + HCl(g)$ system.

(P.T.O...)

(b) Draw and discuss the phase diagram of sulphur system. [8]

3. (a) Discuss the phase diagram of a three component system involving water, chloroform and acetic acid. [8]

   (b) Draw the phase diagram of Lead-Silver system. Indicate the eutectic pont in the diagram. What is the degree of freedom at the eutectic point? [4]

4. (a) State Nernst distribution law. Derive the suitable expression to prove that multistep extraction is more economical than single step extraction. [2+6]

   (b) Explain the principle of steam distillation. [4]

5. (a) Derive Gibb's-Duhem-Margules equation. [8]

   (b) What do you mean by critical solution temperature? What is the pressure effect and isotopic effect on the critical solution temperature. [4]

6. (a) Derive the expression for the rate constant of a reaction of type A $\rightarrow$product. Prove that the time required for completion of half of the reaction is independent of initial concentration. [6+2]

   (b) Write a note on opposing reaction. [4]

7. (a) Derive the relation $\text{Log}\frac{K_2}{K_1} = \frac{Ea}{2.303}\left[\frac{T_2 - T_1}{T_1 T_2}\right]$ [5]

   where the symbols have their usual meanings.

   (b) Discuss the theory oof absolute reaction rate. [7]

8. (a) Deduce an expression for Langmuir adsorption isotherm. How can it be verified? [6+2]

   (b) What are homogeneous and heterogeneous catalysts? Give one example each of homogeneous and heterogeneous catalytic reaction. [4]

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(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.

Group -A

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

(a) What do you mean by VLSI chip? How it is different from MSI, LSI and SSI?

(b) Convert the binary number to hexadecimal number

(c) Convert the following hexadecimal numbers into decimal numbers

(i) 3CA (ii) 3BFC

(d) Explain with the help of truth table

(i) NOT (ii) XOR and (iii) OR gate

(e) What do you mean by K-map?

(f) Find the miniterm for BC+A.

(g) What is half and full adders?

(h) What is primary and secondary memory?

GROUP - B

Answer any FOUR of the following

2. (a) Describe associative distrubutive law in Boolean Algebra with suitable examples. [5]

(b) What is CRO? Draw the block diagram and discuss each unit. [7]

(P.T.O...)

3. (a) What do you mean by minterms and maxterms? Explain with suitable examples. [6]

   (b) Draw a karnaugh map for the following [6]

   $F(A,B) = (A + B)(A + \overline{B})$

4. (a) Design full adder using AND, OR and NOT gates only. [6]

   (b) What do you mean by 2's compliment? Add +9 and -8 using 2's compliment using 8 bits. [6]

5. (a) Design a circuit for a demultiplexer and discuss its working principle. [6]

   (b) Differentiate astable and monostable multivibrator with suitable diagramm. [6]

6. Explain how semiconductor memories are clarrified on the basis of their working? What is the diffeence between RAM, ROM and PROM? [12]

7. (a) Explain what do you understand by a register? Describe the working of a serial-in-serial out shift register. [6]

   (b) Draw a four flip-flop shift register capable of the following: [6]

   (i) Serial entry of data

   (ii) Shift left or shift right operation

8. Write short notes on: [4x3]

   (a) Ring counter

   (b) Parity checker

   (c) Memory Map

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: ZOOLOGY Full Marks: 60

Paper: CORE-VII Time: 3 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Draw labelled diagram wherever required.

GROUP - A

[2x6]

1. Answer any SIX of the following.

(i) Where is stratum germinativum located? Mention its function.

(ii) Name the epidermal derivatives of the birds.

(iii) How many systemic arches are present in birds? State the name (s) of these/this.

(iv) What is the difference between holobranch and hemibranch?

(v) What is difference between mesorchium and mesovarium?

(vi) What is pectin? Mention its functions.

(vii) Which digestive gland has both exocrine and endocrine parts? Name the exocrine parts of it.

(viii) Name the mechanoreceptors that detect touch (contact) and water current.

GROUP-B

Answer any FOUR of the following. [12x4]

2. Give a comparative account of the integument in the vertebrate series.

(P.T.O...)

3. Give a comparative account of the alimentary canal of amphibians and reptiles.
4. Discuss the evolution of aortic arches in vertebrate series.
5. Give a comparative account of the mammalian uteri.
6. Describe the structure of an amphibian brain. How it differs structurally from that of fish and reptile?
7. Write notes on any TWO of the following:
   (a) General plan of circulation
   (b) Lungs of birds and mammals
   (c) Dermal derivatives
8. Write notes on any TWO of the following
   (a) Autostylic and craniostylic jaw
   (b) Open and closed circulation
   (c) Liver of amphibians and mammals.

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(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.

GROUP - A

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

(a) Epistasis

(b) Maternal Inhertiance

(c) Crossing Over

(d) Aneuploidy

(e) Chemical Mutagens

(f) DNA repair

(g) Genetic Drift

(h) Multiple Alleles

GROUP-B

Answer any FOUR questions.

2. Discuss two examples of interaction of genes to advocate the extension of Mendelism. [12]

3. Explain extra-chromosomal inheritance. Substaniate this through shell coiling in snail. [12]

4. What do you understand by Linkage and Crossing Over. Give a note on two factor and three factor cross over. [12]

(P.T.O...)

5. Define mutation and kinds of mutation. Explain how CIB method helps in detection of mutation. [12]

6. Explain your understanding on Cis-Trans complementation test for functional allelism. [12]

7. Discuss the Hardy-Weinberg's Law anad derive relation with natural selection. [12]

8. Write notes on: [6x2]

   (a) Inversion

   (b) polygenic Inheritance

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: COMP. SCIENCE Full Marks: 80

Paper: CORE-VII Time: 3 Hours

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

1. Answer any EIGHT questions. [2x8]

(a) Prove that $(p \wedge q) \rightarrow p$ is a tautology.

(b) If $p \rightarrow q$ is false then find truth value of $(p \vee q) \rightarrow (\sim q)$.

(c) Define paratial ordering relation

(d) If $f(x) = \frac{2x}{x+1}, g(x) = \frac{x+3}{x}$ find $fog\,(x)$.

(e) Define group homomorphism with example.

(f) If in a class the date of birth of all students are different, then find the size of the class.

(g) Define principle of duality.

(h) State Baye's theorem.

(i) Find the Chromatic number of the graph K3,3.

(j) State Euler's formula for planar graph.

2. (a) Prove that $(p \rightarrow q)$ v $(\sim p \rightarrow r)$ is a tautology. [8]

(b) Prove using mathematical induction [8]

$$1 + \frac{1}{4} + \frac{1}{9} + ... + \frac{1}{n^2} < 2 - \frac{1}{n}$$

3. (a) Let A = {a, b, c, d} and R $\rightarrow$ A $\rightarrow$ A be a relation such that R= {(a,d), (b,a), (b,c), (c,a), (c,d), (d,c)}. Find the transitive closure of A using Warshall's Algorithm. [8]

(P.T.O...)

(b) Prove that congruence modulo relation is an equivalence relation. [8]

4. (a) State and prove Lagrange's theorem. [8]

(b) If (G, *) is a group with identity @ and if $a * a = e$ for all $a \in G$, then prove that G is abelian. [8]

5. (a) If $f(x) = \frac{2x}{3-x}, g(x) = \frac{2+x}{x}$ & $h(x) = \frac{1}{x}$ then find $fogoh(x)$ & $hogof(x)$. [8]

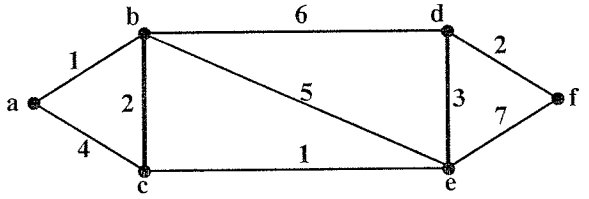
(b) If any lattice state and prove distributive inequlities. [8]

6. (a) How many positive numbers less than 1000 that are not divisible by 6 or 8. [8]

(b) Prove that a graph with n vertices and k components cannot have more than $\frac{(n-k)(n-k+1)}{2}$ edges. [8]

7. (a) Prove that a non empty connected graph G is Eulerian iff its vertices are of even degree. [8]

(b) Apply Dijkstra's algorithm to find the shortest path from a to f. [8]



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

(a) Permutation & Combination

(b) Conditional Probability

(c) Travelling Sale's man problem.

(d) Boolean Expression.

- x - x - x -

No. of Pages: 2

GACR
+3, 3rd SEMESTER END EXAMINATION-2018
(SCIENCE)
Sub.- ETC
PAPER : C -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.

1. Answer any SIX of the following. [2x6]
   a) Find Gray code of binary numbers 110010.
   b) State whether Excess-3 code is a weighted or non-weighted code. Justify your answer.
   c) Using 2's compliment subtract $(11010)_2 - (1100)_2$.
   d) Using NOR gate realize AND gate.
   e) What is racing condition in SR F/f ?
   f) Draw a 4:1 multiplexers using 2:1 multiplexers.
   g) Differentiate combinational and sequential logic circuit.
   h) What are the advantage of CMOS familty?
2. a) Using boolean algebra of boolean theorem simplify [6x2]

   $\overline{A}BC + B\overline{C} + A$

   $x\overline{y}(z + \overline{y}) + xyz + \overline{z}\,\overline{y}$

   b) Convert the following:-
   binary to hexadecimal :- $(100100101.0001)_2$ octal to hexadecimal: $(534.72)_8$

[P.T.O.]

3. a) Draw the circuit Diagram off TTL and explain it . What are the advantage of ECL over TTL ? [6x2]

   b) What is fan-in and fan-out? How power dissipation is calculated? Write down the characteristics of MOS family.

4. a) Define Decoder . How it is different from encoder? Draw the logic circuit diagram truth table at 3:8 decoder & explain it. [6x2]

   b) What is full adder? How a full adder can implemented by using half adder. Draw the block diagram of full adder using half adder. Draw the logic circuit diagram & truth table of full adder & explain it.

5. a) Define flip-flop. Draw the logic circuit diagram, truth-table of different types of f/f and explain it. [6x2]

   b) What is shift register? Differentiate sereial and parallel shift register.

6. a) Describe dual slope A/D convert it using its block diagram & circuit - diagram. [6x2]

   b) Differentiate single slope and dual slope decribe R/2R DAC.

7. a) Write short notes on full subtractor. [6x2]

   b) Write short notes on modulo -N counter.

8. Write short notes on any TWO. [6x2]

   (a) CMOS. (b) Hamming code

   (c) 8:3 encoder (d) Boolean theorem

■■■

No. of Pages: 3

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- **MTC (SOPDE)**

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.

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

   a) Define homogeneous partial differential equation with example.

   b) Form the partial differential equation for the solution $z = ax^2 + by^2$.

   c) Find the solution of $y = px + qy + 2m\,(p+q)$

   d) Define irreducible partial differential equation with example.

   e) Solve the differential equation $(D^2 - D'^2)\,z = 0$ where

   $$D = \frac{\partial}{\partial x},\ D' = \frac{\partial}{\partial y}$$

   f) Use separation of variable to solve $\frac{\partial u}{\partial x} - 2\frac{\partial u}{\partial t} = 0$

   g) Define Laplace equation in 3-variables.

   h) State one-dimension wave equation and heat equation.

[P.T.O.]

2 a) Form the partial differential equation for the solution $z = f(x.y) + g\left(\frac{x}{y}\right)$ [6

b) Find the general solution of
$x\,(y-z)\,p + y\,(z-x)\,q = z\,(x-y)$ [6

3. a) Solve the initial value problem
$y'_1 = y_1 + 2y_2$
$y'_2 = 3y_1 - y_2,\ y_1(0) = 0,\ y_2(0) = -7.$ [6

b) Find the general solution of $zxp - zyq = y_2 - x^3$. [6

4. a) Find the complete integral of the equation
$(p^2+q^2)\,y = qz$ using Charpit's method. [6

b) Find the complete integral of the equation
$p+q = pq$. [6

5. a) Solve the p.d.e. $(D^2 D^1 - 4\,DD^{12})\,z = 0$. [6

b) Solve the p.d.e.
$(D^2 - DD^1 + 2D^1 - 1)\,z = 0$ [6

6. a) Solve $r - t = 0$ using Monge's method. [6

b) Reduce the equation
$\frac{\partial^2 z}{\partial x^2} + x^2 \frac{\partial^2 z}{\partial y^2} = 0$ to cononical form. [6

7. a) Use method of separation of variable to solve
$\frac{\partial u}{\partial x} - 2\frac{\partial u}{\partial t} = u\,(x,\ t)$; where $u\,(x,0) = 6$.

b) Solve the p.d.e with variable coefficient [6
$(x^2D^2 - 4y^2D^{12} - 4yD^1 - 1)\,z = x^2\,y^2$.

8. a) Solve one dimensional diffusion equation.

b) Find a solution of $\frac{\partial v}{\partial t} = k\frac{\partial^2 v}{\partial x^2}$, where $V = V_o$ Sin nt, when $x = 0$ for all values of t and $V = 0$ when $x \to \infty$. [6 [6

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No. of Pages: 3

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(SCIENCE)

Sub: STATISTICS Full Marks: 60

Paper: CORE-VII Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

GROUP - A [1x10]

1. Answer all the questions.

(a) What are the features of a good estimator?

(b) Define consistency of an estimator.

(c) Write the condition for equality in the Carmer-Rao Inequality.

(d) What is the unbiased estimate of variance of S2.

(e) Write the likelihood function of a sample of Binomial variates.

(f) Write the criterions of MLE.

(g) Sketch the confidence belt for obtaining confidence limits of the estimator.

(h) What are UMA and UMAU?

(i) What do you mean by BLUE for the estimation of parameter.

(j) Define estimable function.

(P.T.O...)

GROUP - B

Answer all the questions [10x5]

2. If $X_1, X_2, X_3, \ldots\ldots X\vec{n}$ are a random sample from a Binomial distribution with parameter θ whose *p.m.f.* is

$$f\theta(x)=\begin{cases}\theta^x(1-\theta)^{1-x}, & if\ x=0,1\\ 0, & otherwise\end{cases}$$. Then show the statistic

$T=\sum_i X_i$ is sufficient for θ.

OR

Discuss in detail the properties of good estimator. Explain each with an example.

3. State and prove Rao-Blackwell theorem.

OR

if $X_1, X_2, X_3 \ldots X_n$ be a random sample from a Poisson distribution with parameter θ whose *p.m.f.* is

$$f\theta(x)=\begin{cases}\frac{e^{-\theta}\theta^x}{x!}, & if\ x=0,1,2,3,\ldots.\\ 0, & otherwise\end{cases}$$. Estimate the MVU estimator for the parameter θ.

4. Discuss how to estimate parameters by method of maximum likelihood for both discrete and continuous distributions.

OR

By the method of moments, obtain the maximum likelihood estimator of the parameter θ for a sample of random variables whose *p.d.f.* is given by

$$f\theta(x)=\frac{1}{\theta}\exp(-x/\theta),0<x<\infty.$$

5. If $X_1, X_2, X_3, \ldots X_n$ be a random sample from $N(\mu, \delta^2)$, where both μ and δ^2 are unknown. Obtain the confidence interval for μ.

OR

If X1, X2, X3,.... Xn be a random sample from $N(\mu, \theta)$ where μ is known but not θ, $0<\theta<\infty$. Obtain the confidence interval for θ.

6. Discuss Gauss - Markov linear model and the theorem meant for linear estimation.

OR

A necessary and sufficient conditioon for the linear function $\mathbf{l}'\beta$ of the parameters to be linearly estimable is rank (A) = rank $\begin{Bmatrix}A\\ l'\end{Bmatrix}$, where $\begin{Bmatrix}A\\ l'\end{Bmatrix}$ is the matrix obtained from A by adjoining the rwo vector l'.

- x - x - x -

No. of Pages: 3

GACR
+3, 3rd SEMESTER END EXAMINATION-2018
(SCIENCE)
Sub.- MATHEMATICS
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.

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

a) Find the order and degree of

$2(y'')^{2/5} - 3(y'')^{5/3} = Sin\ x.$

b) Solve $\frac{dy}{dx} = 7y + x,\ y(0)=1,$

c) Form the partial differential equation for

$z = ax^2+by^2.$

d) Find the solution of $z= px + qy - \frac{2pq}{p^3+q^2}$.

e) Write down the laplace equation in Polar form.

f) Write down two dimensional wave equations.

g) Solve the p.d.e. using variable separable method.

$\frac{\partial u}{\partial x} = \frac{\partial u}{\partial y}$.

h) Solve $(D^3+3D^2D'-4D'^2)\ z = 0$

Where $D = \frac{\partial}{\partial x}$ $D' = \frac{\partial}{\partial y}$

[P.T.O.]

i) From the p.d.e. for $z = a f(x) + by$.

j) Write down D-alembert's solution of wave equation.

Answer any FOUR questions.

2. a) Find the general solution of [8

$$\frac{dx}{dt} = 3x - y \; ; \; \frac{dy}{dt} = 4x - y$$

b) Find the complete integral of the p.d.e. [8

$p^2+q^2 = x + y.$

3. a) Find the complete method of the p.d.e. [8

$x^2p^2 + y^2q^2 = z^2.$

b) Form a p.d.e. by eliminating the functions [8

$$z = f(xy) + g\left(\frac{x}{y}\right)$$

4. a) Find the generl solution of $zxp - xyq = y^2 - z^2$ [8

b) Find the complete integral of the p.d.e. [8

$(p^2 + q^2)\, y = q\, z$ using Charpit's method.

5. a) Solve $(x^2D^2 - 4y^2D'^2 - 4yD' - 1)\, z = x^2y^2$ [8

b) Solve $r - t = 0$ using Monge's method. [8

6. a) Reduce the equation. [8

$$\frac{\partial^2 z}{\partial x^2} + x^2 \frac{\partial^2 z}{\partial x^2} = 0$$ to cononical form.

b) Use method of separation of variable to solve. [8

$$\frac{\partial^2 u}{\partial x^2} - 2\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$$

7. a) Form I-Dimensional wave equation [8

b) Solve I-Dimensional wave equation using D-Alembert's method. [8

8. a) Classify and reduce the equation [8

$x^2r + 2\,xys + y^2t = 0.$

b) Prove that the transformation $\eta = y - \frac{x^2}{z}, z = s$ [8

reduces the equation $r + 2xs + x^2 t = 0$ to

$$\frac{\partial^2 z}{\partial z^2} + \frac{\partial z}{\partial \eta} = 0 \; .$$

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No. of Pages: 3

GACR

+3, 3rd SEMESTER EXAMINATION-2018
(ARTS)
ECONOMICS (CORE-VII)

Time: 3 Hours | Full Marks: 80

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

GROUP-A [2x8]

1. Answer any EIGHT of the following questions within 2to3 sentences in each case.

(a) What is frequency distribution?

(b) State the formula for calculation of Geometric mean by using Logarithms.

(c) Briefly explain 'probable error of r'.

(d) If bxy=0.6 and byx=0.8, calculate correlation coefficient.

(e) Write the value of correlation coefficient when there is perfect positive correlation.

(f) What is standard error of estimate?

(g) Define secular trend.

(h) What are Index numbers?

(i) State the multiplication rule of probability.

(j) What is Normal distribution?

GROUP-B [16 x 4]

Answer any FOUR questions.

2. (a) Find out standard deviation, its coefficient and coefficient variation from the following series. [10]

(P.T.O...)

Group	1-3	4-6	7-9	10-12	13-15
Frequency	9	3	5	2	1

(b) Distinguish between [3+3]

(i) Questionnaire and Schedule

(ii) ranage and inter-quartile range.

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	8	11	26	9	6

(b) Distinguish between [3+3]

(i) Skewness and Kurtosis

(ii) Measures of central tendency and Measures of dispersion.

4. (a) Calculate Coefficient of rank Correlation from the following data. [10]

X:	15	10	20	28	12	10	16	18
Y:	16	14	10	12	11	15	18	12

(b) (i) What is Rank Correlation? State its merits. [3+3]

(ii) Prove that Correlation Coefficient Varies between ± 1.

5. (a) Calculate Karl Pearson's Coefficient of Correlation from the following data. [10]

X:	65	66	67	68	69	70	71
Y:	67	68	66	69	72	72	69

6. (a) Find out two regression lines for the data given below using the method of least square. [10]

X:	5	10	15	20	25
Y:	20	40	30	60	20

(b) What do you mean by regression? Why are there two regressioon lines in case of a bivariate series? [3+3]

7. (a) From the following data, calculate price index number for 2015 with 2005 as base by Fisher's method. [10]

Commodity	Price	Quantity	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

(b) What is Fisher's ideal index? Prove that it satisfies both the time reversal test and factor reversal test. [3+3]

8. (a). A bag contains 5 white and 3 black balls. Two balls are drawn at random one after another without replacement. Find the probability that both balls drawn are black. [10]

(b) (i) State and prove addition theories of probability. [3+3]

(ii) Briefly explain the properties of normal distribution.

-x-x-x-