No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(COMMERCE)

Sub.- Macro Economics

PAPER : GE-III

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) What are the two sectors in a two sector circular flow of income model?

ii) Mention any two fiscal methods to control inflation.

iii) Who developed Aggregate Demand Theory?

iv) Define subsidy.

v) Mention any two social cost of inflation.

vi) Is devaluation the cause of inflation? Justify.

vii) Give two examples of Indirect Tax in India.

viii) Give any two factors affecting supply of money in India.

ix) What are the two important factors affecting investment function?

x) What is James Tobin's contribution to economics?

Answer any FOUR questions.

2. Elaborately explain four sectors circulation flow of income. [16

P.T.O.

3.		How relevant is IS-LM model in today's world? Justify your statements.	[16
4.		Discuss the role of Macro Economics in business decission making?	[16
5.		Write short notes on :	
	a)	Causes of Inflation.	[8
	b)	Effects of Inflation.	[8
6.		How is foreign exchange rate determined in India, currently?	[16
7.		What are the various factors affecting demand for money in India? Eplain from Indian context.	[16
8.		It is believed that GST is for the development of the Indian economy, but the process of GST is not simple from the view point of small business houses. What are the problems associated with GST and as a commerce student what is your solutions to those problems?	[16

■■■

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(ARTS)

SOCIOLOGY (GE-III)

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) Define Social Change.

(b) What is "Sarvodaya' according to Gandhi?

(c) Name two theorists of the conflict theory of Social Change.

(d) Mention two examples of effects of technology on society.

(e) Write two indicator of social development.

(f) What is Evolution?

(g) What is cultural Lag?

(h) What are the uses of Human Development Index?

(i) Write any two merits of capitalist model on development.

(j) Mention any two role of ideology in the society.

GROUP-B

Answer any FOUR of the followings.

[16x4]

2. Discuss the characteristics of Social Change.

3. Describe cyclical theory of Social Change.

(P.T.O...)

4. Explain the role of culture in bringing Social Change.

5. Describe the factors accelerating Economic Growth.

6. Examine the disadvantages of Capitalist model of Development.

7. What are the merits of socialistic model of development?

8. Define Economic Growth and distinguish between Economic Growth and Social Development.

-x-x-x-

No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(ARTS)

Sub.- **Philosophy**

PAPER : GE-III

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 non-moral action?
   ii) State the object of moral judgement.
   iii) What is the implication of psychological hedonism?
   iv) State the meaning of an imperative.
   v) What is crime?
   vi) What is a sin?
   vii) Differentiate between motive and 'intention'.
   viii) What is hedonistic calculus?
   ix) Name two theories of individual society relationship
   x) Define secularism.

[P.T.O.]

Group - 'B'

[16x 4]

Answer any FOUR questions.

2. What is the object of moral judgement. Discuss.
3. Is Ethics a normative study? Give reasons for your answer.
4. What is categorial imperative? Discuss after Kant.
5. State and explain Mill's theory of Utilitarianism.
6. Discuss the organic theory of society.
7. Why is the Reformative theory of punishment is accepted as an idea? Discuss.
8. Explain in brief the concept of justice.

■■■

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(ARTS)

POL. SCIENCE (Hons: GE-III)

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) Gandhian model oof economic development.

(b) Medhapatekar

(c) Passive resistence

(d) Ahimsa

(e) Anti untouchability movement by Gandhi.

(f) Gandhi on caste system.

(g) What is apartheid?

(h) What is Gandhigiri?

(i) What is Swaraj?

(j) Hizarat

GROUP-B

Answer any FOUR questions. [16 x 4]

2. What is alternative modernity? Discuss Gandhiji's alternative perception of modernity.

OR

Write a short essay on Narmada Bachao Andolan.

(P.T.O...)

3. Critically analyse Gandhian Principles of Satyagraha.

OR

Discuss the Gandhian idea of Trusteeship.

4. Analyse Gandhian view on caste system

OR

Discuss role of Gandhi on Social harmony in 1947 in India.

5. Discuss anti racism movements in USA.

OR

Critically examine the pacifist movement

6. Analyse the role of Gandhi in various women movement in India.

OR

What do you mena by Gandhigiri? Discuss its relevance in the modern world.

7. Analyse various characterstics of Gandhian Swaraj.

OR

Discuss the ideal state of Gandhi.

8. Gandhi is the Father of Swadeshi movements in India. Examine

OR

Various Freedom struggles led by Gandhi. Explain.

- x - x - x -

No. of Pages: 2

GACR

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

Sub: ODIA Full Marks: 80
Paper: GE-III Time: 3 Hours

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

କ - ବିଭାଗ (ବାଧତା ମୂଳକ)

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

(କ) ବ୍ୟାଖ୍ୟାତ୍ମକ ଫିଚର କାହାକୁ କହନ୍ତି ?

(ଖ) ଅପ୍ରତ୍ୟାଶିତ ସମ୍ବାଦ କାହାକୁ କହନ୍ତି ?

(ଗ) ସମ୍ବାଦ ସଂଗ୍ରହକାରୀର ନୀତି କିଭଳି ହେବା ଉଚିତ୍ ?

(ଘ) ସମ୍ବାଦ ସଜ୍ଜିକରଣର ପଦ୍ଧତି ଗୁଡ଼ିକ କଣ ?

(ଙ) ରୂପକାତ୍ମକ ସମ୍ବାଦ କାହାକୁ କହନ୍ତି ?

(ଚ) ସାର୍ଥକ ଫିଚରର ରୂପ ରେଖା କିଭଳି ହେବା ଉଚିତ ?

(ଛ) ସମ୍ବାଦ ପ୍ରସ୍ତୁତିର ସୋପାନ ଗୁଡ଼ିକ କଣ ?

(ଜ) ଗଣ ମାଧ୍ୟମ କାହାକୁ କହନ୍ତି ?

(ଝ) ସମ୍ବାଦର ଶିରୋନାମା କିଭଳି ହେବା ଉଚିତ ?

(ଞ) ପାରମ୍ପରିକ ଗଣ ମାଧ୍ୟମ କାହାକୁ କହନ୍ତି ?

ଖ- ବିଭାଗ

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

୨. ଗଣ ମାଧ୍ୟମ କେଉଁ କେଉଁ ଅବସ୍ଥା ଭେଦ ଦେଇ ଆଧୁନିକ ଜୀବନକୁ ପ୍ରଭାବିତ କରୁଛି ଆଲୋଚନା କର ।

(P.T.O...)

୩. ଗଣମାଧ୍ୟମର ସଜ୍ଞା ଲେଖି ପାରମ୍ପରିକ ଗଣ ମାଧ୍ୟମର ଉପଯୋଗୀତା ସମ୍ପର୍କରେ ବର୍ଣ୍ଣନା କର।

୪. ଜନ ସଚେତନତା ସୃଷ୍ଟି କରିବାରେ ସାମାଜିକ ଗଣମାଧ୍ୟମର ଭୂମିକା ଓ ଗୁରୁତ୍ୱ ନିରୂପଣ କର।

୫. ସମ୍ବାଦ ସଂଗ୍ରହ ଓ ପରିବେଷଣ ପଦ୍ଧତି ଉପରେ ଆଲୋକପାତ କର।

୬. ସମ୍ବାଦର ପରିଭାଷା ଓ ସ୍ୱରୂପ ଉଲ୍ଲେଖ କରି ସଚେତନତାର ବାର୍ତ୍ତା ପ୍ରଦାନ କରିବାରେ ଏହାର ଭୂମିକା ନିର୍ଣ୍ଣୟ କର।

୭. ଗ୍ୟରିସ୍ତରୀୟ ପଦ୍ଧତିକୁ ନେଇ କିପରି ଏକ ଭାବ ଉଦ୍ରେକ ଧର୍ମୀ ସମ୍ବାଦ ପ୍ରସ୍ତୁତ ହୋଇଥାଏ ବୁଝାଇ ଲେଖ ?

୮. ଆକୃତି ସମ୍ବାଦ ବା ଫିଚର କାହାକୁ କହନ୍ତି ? ଏହାର ପ୍ରସ୍ତୁତି କୌଶଳ ସମ୍ପର୍କରେ ଆଲୋଚନା କର।

- x - x - x -

No. of Pages: 2

GACR

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

Sub: HISTORY Full Marks: 80

Paper: GE-III Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

SECTION-A (Compulsory)

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

(a) When India national Congress was formed. Who were the members?

(b) Who is regarded as the father of India renaissance and when he founded Brahma Samaj?

(c) Who was the founder of the Parthana Samaj and when it was established?

(d) Who were the main leaders of extremist periood of Indian National Congress and who was the first women president of Indian National Congress.

(e) What was the first national movement of Mahatma Gandhi and why the movement was stopped.

(f) Who were the founder of Swarajya party and when Motilal Neheru joined Indian Nation Congress party.

(g) Who was the president of INC during the time of Quit India movement, who was the first education minister of India after independence?

(h) Who was the founder of Muslim league in India and who was the prominent leader of Muslim league?

(i) When the cabinet mission came to India and who were the members?

(P.T.O...)

(j) When Lord Mountbatten came to India as a Vice Roy. Who was the Primeminister of England during that time.

SECTION-B

Answer any FOUR of the followings. [16x4]

2. Discuss the British impact on Indian society and culture.

3. Discuss the role of extremist in Indian National Congress for achievement of independence.

4. Give an account of Swadesh movement in India.

5. Describe causes and consequences of the non co-operation movement in India 1921-22.

6. Discuss the ideology and role of Muslim League for creation of Pakistan and role of Jinna.

7. Give an account of Mount Batteon plan and formation of Pakistan and India.

8. Give an account of Integration of the princely states with India union.

- x - x - x -

No. of Pages: 3

GACR

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

Sub: HINDI Full Marks: 80
Paper: GE-III 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. निम्नलिखित प्रश्नों में से किन्हीं आठ के अति संक्षप्ति उत्तर दीजिए। [2x8]

(क) युरोप में स्वस्छदंतबाद का जन्म किस शताब्दी में हुआ?

(ख) क्रोचे के अनुसार स्वयंप्रकाश ज्ञान का अर्थ क्या है?

(ग) वेनदेतों क्रोचे ने अभिव्यजंनावाद की स्थापना अपने किस ग्रन्थ में की है?

(घ) अस्तित्ववाद के प्रवर्तक का नाम लिखिए।

(ङ) अस्तित्वंवादी दर्शन में किसे ज्यादा महत्व दिया गया है?

(च) मार्क्स के द्वन्द्वात्मक भौतिकवाद के प्रभाव स्वरूप भारतीय साहित्य में किस् बाद का जन्म हुआ?

(छ) मार्क्स का द्वन्द्वात्मक भौतिकवाद-प्राचीन आनन्दवादी दृष्टिकोण का समर्थन करता है अथवा विरोध?

(ज) सिगमण्ड प्रंयड नें मानव जीवन के सभी व्यापारों के मूल में क्या स्वीकार किया है?

(P.T.O...)

२. निम्नलिखित प्रश्नों में से किन्हीं चार प्रश्नों के उत्तर दीजिए। [16x4]

(क) स्वच्छदतावा की प्रमुख प्रवृतियों को अपने शब्दों मे लिखिए।

(ख) क्रोचे के अभीव्यंजनावाद का संक्षिप्त परिचय देकर इसकी विशेषताओं को लिखकर समझाइए।

(ग) बिम्बवाद की प्रमुख मान्यताओं का परिचय दीजिए।

(घ) यथार्थवाद का अर्थ स्पष्ट करके इसके उद्‌भव के कारणों को लिखिए।

(ङ) मार्क्सवाद के द्वन्द्वात्मक भौतिकवाद की चर्चा अपने शब्दों मे कीजिए।

(च) उत्तर आधुनिकतावाद को चर्चा कीजिए।

(छ) (i) शास्त्रीयवाद पर टिप्पणी लिखिए।

(ii) प्रतिकवाद का परिचय प्रदान कीजिए।

- x - x - x -

No. of Pages: 2

GACR

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

EDUCATION (Hons: GE-III)

Time: 3 Hours | Full Marks: 60

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

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

(i) Instructional objectives.
(ii) Summative evaluation
(iii) Multiple choice test item
(iv) Rating scale
(v) "Guess who" technique
(vi) Content analysis
(vii) Reporting in assessment
(viii) Grading system

Answer any FOUR of the following.

2. Discuss the issues associated with the existing practices of assessment. Suggest some measures to overcome the shortfalls of current assessment procedure. [6+6]

3. Draw a line of demarcation among measurement, evaluation and assessment. Explain their role in teaching. [6+6]

4. Discuss the principles of constructing extended and restricted response type test items. [6+6]

(P.T.O...)

5. Explain Anecdotal Record as an alternative technique of assessment. [12]

6. What is portfolio? Suggest measures to improve portfolio assessment. [6+6]

7. Differentiate between norm-referenced and criterion-referenced interpretation of test scores with suitable examples. [12]

8. What is continous comprehensive evaluation? Discuss its importance at the secondary stage. [6+6]

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(ARTS)

ECONOMICS (GE-III)

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 Consolidation of Holdings?

(b) State any two sources of non-institutional credit in India.

(c) What is FEMA?

(d) Point out any two functions of IDBI.

(e) Name the activities that are included in Tertiary sector.

(f) Write down the objectives for establishing Primary Health Centre.

(g) Give the meaning of Import substitution.

(h) What id FDI?

(i) State the important features of National policy on Education, 1986.

(j) What do you mean by external sector?

GROUP-B [16 x 4]

Answer any FOUR questions.

2. Account for the causes of low productivity in Indian agriculture.

(P.T.O...)

3. Explain the new agricultural strategies adopted in India since mid-sixties.

4. Discuss the salient features of the New industrial policy, 1991.

5. Examine the preventive and corrective measures adopted to combat industrial sickness in India.

6. What is meant by Services-led-growth? Explain the main service sector areas in Indian economy.

7. What is Human Resources Development? Explain health and nutrition as the main indicators of Human Resource Development.

8. Explain the role of MNCs in economic development of India.

- x - x - x -

No. of Pages: 2

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- COMPUTER SCIENCE

PAPER : GE- III

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.

Section - 'A'

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

   a) Define manipulator with example.

   b) Differentiate user defined and derived data types.

   c) What do you mean by Pre-tested loop?

   d) What do you mean by nesting of member functions?

   e) Describe 'this' pointer.

   f) What do you mean by function overloading?

   g) Draw the relation between 'class' and 'object'?

   h) What do you mean by type casting?

Section - 'B'

2. a) Describe the features of OOP in brief. [6

   b) Describe different operators used in C++. [6

3. a) Describing the need of friend function, support your answer with an example to illustrate. [6

   b) Why UDF is used? Elaborate the steps to use UDF with example. [6

P.T.O.

4. a) Define constructor and destructor. Give an example to demonstrate their uses. [6

   b) Write a programm to enter two distances in feet and inches. Overloading '+' operator find their sum. [6

5. a) Describe multi-level inheritances with an example. [6

   b) By giving an example illustrate how polymorphism works. [6

6. a) Briefly describe formatted and unformatted I/O operations with command syntaxes. [6

   b) Write a program to find how many times a given character is present in a text file "ABC.TXT." [6

7. a) Describe the structure of C++ program. State the compiling and linking steps in brief. [6

   b) Briefly describe the applicationof OOPs. [6

8. Write short notes (any THREE)

   a) Static Data Member and Static member Function

   b) Sequential vs. Random files [3 x4

   c) Default and constant argument

   d) Scope Resolution operator.

■■■

No. of Pages: 2

GACR

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

Sub: BOTANY Full Marks: 60

Paper: GE-III Time: 3 Hours

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

GROUP - A

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

(a) Parenchyma

(b) Periderm

(c) Resin duct

(d) Lenticels

(e) Helobial endosperm

(f) Pollen-Pistil interaction

(g) True polyembryony

(h) Cambium

GROUP-B

Answer any FOUR questions.

2. Describe the theories relating to the organisation of shoot apex. [12]

3. Give an account of morphological and anatomical adaptations in hydrophytes with suitable examples. [12]

4. Describe the dvelopment of a female gametophyte in angiosperms. [12]

5. Discuss the development of a typical dicot embryo. [12]

(P.T.O...)

6. What is apomixis? Discuss diffeent types of mechanism of apomixis. [12]

7. What is pollination? Explain various types and adaptation of cross pollination. [12]

8. Write notes on [6x2]

   (a) outbreeding devices

   (b) Allochory.

- x - x - x -

No. of Pages: 2

GACR

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

Sub: ZOOLOGY Full Marks: 60

Paper: GE-III 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

1. Write short notes on any SIX. [2x6]

(a) Assays

(b) Calorimeter

(c) Use of fermenters

(d) Cell harvesting methods

(e) Magnetic Resonance Imaging

(f) Use of Radioisotopes in Biology

(g) Adrenalectomy

(h) Perfusion techniques

GROUP-B

Answer any FOUR of the following.

2. What is spectrophotometer? Discuss the working principle of a UV-visible spectrophotometer [12]

3. How are electron microscopes different from light microscopes? Describe the process of image formation in scanning Electron Microscope. [12]

4. Discuss the design and functioning of a tissue culture laboratory. [12]

(P.T.O...)

5. What is data? Discuss different computer aided techniques used data presentation. [12]

6. Define Antigen-Antibody interaction. Discuss different immunological techniques based on Antigen -Antibody interaction along with their applications. [12]

7. What is electrophoresis? Differentiate between Agarose gel electrophoresis and SDS PAGE electrophoresis. [12]

8. What is Sterilisation? Why sterilisation is an essential aspect of Microbiology? Discuss different methods of sterilization used in microbiology. [12]

- x - x - x -

No. of Pages: 3

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(SCIENCE)

Sub: CHEMISTRY Full Marks: 60

Paper: GE-III 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) State first law of Thermodynamics.

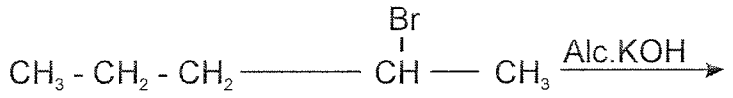
(b) What do you mean by standard enthalpy change in a raction?

(c) What happens when sodium benzoate is heated with sodalime?

(d) Write the expression for the free energy change in the chemical reaction.

$aA + bB + ... \rightleftharpoons lL + mM + ...$ in terms of chemical potential.

(e) Write the product of the following reaction.



(f) What happens when n-propyl alcohol is treated with Pyridinium Chlorochromate?

(g) What is Schotten-Baumann reaction? Give an example.

(h) What is the reaction of acetaldehyde with hydroxyl amine?

(P.T.O...)

GROUP - B

Answer any FOUR questions.

2. (a) Discuss the method of determination of absolute entropy of a gas at temperature TK. What is the value of absolute entropy of a perfectly crystalline solid at absolute zero temperature? [8+1]

   (b) The heat of raction of $\frac{1}{2}H_2 + \frac{1}{2}Cl_2 \rightarrow HCl$ at 27^0C is -22.1 kCal. Calculate the heat of reaction at 127^0C. (Given - the Molar heat capacities at constant pressure at 27^0C for H_2, Cl_2 and HCl are 6.82, 7.70 and 6.80 Col^{mol-1} respectively.) [3]

3. (a) Thermody namically derive the law of Chemical equilibrium. Give the statement of this law. [7+2]

   (b) Write the factors affecting degree of dissociation of an electrolyte. [2]

   (c) Write the relation between degree of dissociation and dissociation constant of a weak acid. [1]

4. (a) Derive an expression for the solubility product of Agcl in terms of its solibility. when H_2S gs is passed through an acidified solution containg the cations of Group II and Group III (B) only Gr II, radicals are precipiteted as their sulphides & not those of Group III (B). Give reason. [3+3]

   (b) Derive the relation between hydrolysis constant, ionic product of water and dissociation constant in case of the salt of weak acid and strong base. [6]

5. (a) Write a note on S_N1 reaction. [4]

   (b) How is benzene converted to nitrobenzene? [2]

   (c) What happens when ethylbromide is treated with $AgNO_2$ solution? [2]

   (d) How will you prepare benzene from sodium benzene sulphonate? [2]

   (e) How is I-Bromopropane converted to propene? [2]

6. (a) What is Luca's test? By this test how will you distinguish between 1^0, 2^0, and 3^0 amines. [4]

   (b) How is iodobenzene prepared from benzene diazonium chloride? [2]

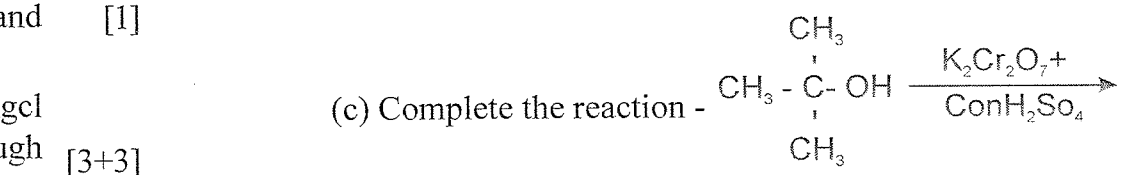
   (c) What is Sandmeye'r reaction? Give an example. [2]

   (d) How is propan-2-01 prepared from CH_3MgBr? [2]

   (e) What happens when ethyl alcohol is heated with acetic acid in presence of a little amount of $Con.H_2SO_4$. [2]

7. (a) Give a method of preparation of phenol. What happens when phenol is treated with (i) $DilHNO_3$ (ii) $Conc.HNO_3$ and (iii) Bromine water? [8]

   (b) What is the action of ethylmethyl ether with HI? [2]

   (c) Complete the reaction -  [2]

8. (a) Write notes on: [4x2]

   (i) Aldol condensation

   (ii) Clemmenson reduction

   (b) How is benzaldehyde prepared by Rosenmund's reduction? [2]

   (c) How does acetone react with $NaHSO_3$? [2]

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No. of Pages: 3

GACR

+3, 3rd SEMESTER EXAMINATION-2018

(SCIENCE)

Sub: STATISTICS Full Marks: 60

Paper: GE-III Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

1. Answer any SIX. [2x6]

(a) State Empiricall defination of Probability.

(b) A and B throw with three dice. If A throws 8, what is B's chance of throwing a higher number.

(c) Explain uses of moving average in time series.

(d) Explain limitation of classical approach probability.

(e) What factors are responsible for the occurance of cycles?

(f) What are the demerits of the semi average method.

(g) What are the uses of index number?

(h) Index number are known as _____. It is a special type of _____.

2. (a) If 1P (A\B) = Prove that P (ABC) = P (BC) [6+6]

(b) Showo that P (AB) $\geq$ P (A) + P (B) -1

3. (a) For any three events A, B and C, prove that [6+6]

$$P(A \cup B \mid C) = P(A \mid C) + P(B \mid C) - P(A \cap B \mid C)$$

(b) There are three events A, B and C, one of which must, and only one can happen, the odds are 7 to 3 against A and 6 to 4 against B. Find the odds against C.

(P.T.O...)

OR

Describe different methods for determining trend in a time series. Examine critically the merits and demerits of these methods. [12]

4. (a) Explain how the principle of last squares is used to estimate trend in time series. [6+6]

(b) Describe methods of moving average for estimating the trend in a time series. Discuss its merits and demerits.

5. (a) Describe how will you fit modified exponential curve of type $Yt = a+bc^t$, where $a > 0$. [6+6]

(b) Describe how will you fit logistic curve of type

$$Yt = \frac{K}{1 + e^{ia + bt}}, b < 0.$$

6. What do you mean by index number. Explain its types, characteristics, uses and limitations. [12]

7. (a) Give your Choice between Laspeyre's and Paasche's formulas along with your comments. [4]

(b) What do you meann by splicing of index numbers and how to implement it. [4]

(c) What do you mean by cost of living index number. Explain its purpose. [4]

8. (a) Construct the consumer price index number for 200 on the basis of 1999 from the following data using (i) Family budget method (ii) Aggregative expenditure method [6+6]

Commodity	A	B	C	D	E
Weight :	40	20	15	20	5
P_0 (Rs):	16	40	0.50	5.12	2
P_1 (Rs):	20	60	0.50	6.25	1.50

(b) From the chain base index number, Find fixed based index number

Year:	2005	2006	2007	2008	2009
Chain base Index	80	40	120	90	140

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GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- MATHEMATICS

PAPER : GE - III

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) Define vector space.

b) Find the rank of $\begin{pmatrix} 1 & 3 & 1 \\ 2 & 2 & 1 \\ 3 & 5 & 2 \end{pmatrix}$

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

d) Solve the system $ax + by = c\,;\quad bx + ay = d$

e) If G $=\{x:\ x$ *is an integer mod 5*$\}$ is a group under multiplication- then find its identity element and order of G.

f) Write down the characteristics eq^n for the matrix

$\begin{pmatrix} 2 & 1 \\ 1 & 1 \end{pmatrix}$

g) State Lagrange's theorem

h) Define zero divisior with example.

[P.T.O.]

i) Define permutation group with example.

j) State Remainder theorem.

2 a) Prove that the following three vectors of 4 -tuples are linearly dependent. (1,−1, 5,4) (−1, 3,1, 4) & (1, −2, 2,0) . [8

b) State and prove fundamental theorem of finite dimensional vector spaces. [8

3. a) Exhibit two extensions of the following two linearly independent 4-tuples. [8

(2, 1, −5, 1) and (1, 4, −7, 6)

b) Prove that the vector (1, −3, − 2) belongs to the subspace generated by the vectors (1, 4, 3) and (3, −2, −1). [8

4. a) Find the rank of the matrix $\begin{pmatrix} 2 & 4 & 8 & 14 \\ 3 & 6 & 12 & 21 \\ 4 & 7 & 15 & 25 \\ 5 & 8 & 18 & 29 \end{pmatrix}$ [8

b) Test the consistency of the system

$x + 2y + 3z = 12$

$2x + y + 3z = 13$

$5x + 4y + 9z = 38$ [8

5. a) Find the eigen values of the matrix. $\begin{pmatrix} 3 & 1 & 4 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{pmatrix}$

Hence find the eigen vectors. [8

b) Find the dimension and basic of (1, 1, 1,), (−1,0, 1), (1,2, 3) (−1, 0, 1) (1, 2,3) & (1,−1, −3) in V_{3o} . [8

6. a) Define normal subgroup. Prove that a subgroup N of G is a normal subgroup of G if and only if every left coset is a right coset of N in G. [8

b) Define semigroup and monoid. Prove that a subset H of G is said to be a subgroup of G if and only if for a, b, $\in$ H, $ab^{-1} \in H$. [8

7. a) Prove that every finite integral domain is a field. [8

b) Prove that if U is an ideal of the ring R then R/U is a ring and homomorphic image of R.

8. a) Define zero divisor with example. Also prove Remainder theorem. [8

b) Solve the following system using row-reduction method. [8

$2x + 3y - z = 4$

$x + 4y + 2z = 7$

$3x + y + z = 5$

c) A solenood coil of 300 turns per meter is carrying a current of 5A. The length of the solenood is 0.5 and has a radius of 1 cm. Find the magnitude of magnetic field inside the solenood.

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No. of Pages: 4

GACR
+3, 3rd SEMESTER END EXAMINATION-2018
(SCIENCE)
Sub.- Physics
PAPER : GE- III

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 of the following.

a) Find div $(\vec{\Pi}'\vec{\Pi})$, where $\vec{\Pi} = \hat{i}x + \hat{j}y + \hat{k}z$

b) Show that $\vec{F} = (2xy + z^3)\hat{i} + x^2\hat{j} + 3xz^2\hat{k}$ is a conservative force field.

c) How much elective flux will come out through a surface $\vec{S} = 5\hat{j}$ kept in an electrostatic field $\vec{E} = 3\hat{i} + 4\hat{j} + 8\hat{k}$.

d) If 100 joule of work must be done to move electric charge of 4c from a place where the potential is -10v to another place wher a potential is v volt. Find the value of V.

e) What will be the capacity of a parallel plate capcitor where area of each plate is doubled and the distance between the plates is halved.

f) Prove that $\vec{D} = G\vec{E} + \vec{P}$,

Where $\vec{D}$ = Displacement vector

$\vec{E}$ = Electric field

$\vec{P}$ = Polarisation vector

g) Given that $\vec{B} = \vec{\nabla} \times \vec{A}$ and $\vec{\nabla}.\vec{A} = 0$ then prove that $\nabla^2 \vec{A} = \mu_0 \vec{J}$. Where symbols have their usual meanings.

h) State Ampere's circuital law.

Group - B

2. a) State Stoke's theorem. Hence prove that $\int_c \vec{\Pi} \times d\vec{\Pi} = 2 \iint_s d\vec{s}$ where $\vec{s}$ is a diaphagm enclosing a circuit of C. [6

b) Prove that div curl $\vec{A} = 0$. [3

c) Prove that [a + b, b+c, c+a] = 2 [a b c]. [3

3. a) Evaluate $\iiint_v (\vec{\nabla} \times \vec{F}) dv$. Where V is the closed region bounded by the plane $x = 0, y = 0, z = 0,$ and $2x + 2y = z = 4$ and $\vec{F} = (2x^2 - 3z)\hat{i} - 2y\hat{j} - 4x\hat{k}$. [4

b) Using Gauss's theorem show that $\oiint_s (\nabla \pi^2).d\vec{s} = 6v.$ where S is the surface & V is the volume. [5

c) Prove that the position vector is an irratational vector. [3

4. a) Explain the physical significance of curl of a vector function. Give examples . [4

b) Show that : [5

$(\vec{A} \times \vec{B}).(\vec{C} \times \vec{D}) + (\vec{B} \times \vec{C}).(\vec{A} \times \vec{D}) + (\vec{C} \times \vec{A}).(\vec{A} \times \vec{D}) = 0$

c) Find a unit vector in to the surface $x^2 + y^2 - z^2 = 11$, at the point (4, 2, 3) [3

5. a) Derive an expression for electric field intensity due to infinite plane sheet of charge. [6

b) Derive Columb's law from Gauss law. [4

c) A force of 2.25 N acts on a charge of 15 x 10^{-4}/C calculate the intensity of electric field. [4

6. a) Explain the principle of capacitor. Derive an expression for the capacitance of a parallel plate capacitor. [6

b) Define capacitance of a capacitor. Prove that the total energy stored in parallel plate capacitor is $\frac{1}{2}cv^2$. [6

7 a) State Biot-Savart's law. Using the law derive an expression for magnetic field on the axis of a circular coil carrying current. [8

b) A circular coil has 35 turns and a mean radius of 35 turns. It carries a current of 1.2 ampere find the magnetic field at a point on the axis of the coil at distance 40 cm from it's centre. [4

8. a) Derive the integral form of Ampere's circuital law. [4

b) Derive the expression for for magnetic field on the axis of straight solenood carrying current.

No. of Pages: 3

GACR

+3, 3rd SEMESTER END EXAMINATION-2018

(SF)

Sub.- (MATH. SF)

PAPER : GE - III

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) Test the linear dependency of
   $\{1, 1, 3), (2, 1,0), (3,2,3)\}$

   b) Find the Fourier series of $Sin2x$ *in* $0 \le x \le \pi$.

   c) What are periods of $|\cos 3x|$ & $\left|\tan\frac{x}{2}\right|$.

   d) Determine whether the function e^{x^2} is even or odd.

   e) Prove that $\beta(m,n) = \beta(n,m)$

   f) Evaluate $\int_0^\infty e^{-x}.x^{3/2}.dx$

   g) Find a_o *and* a_n *for* $f(x) = x, -\pi < x < \pi$

   h) Define fourier sine integral and fourier cosine integral.

   i) Find L{t sin 3t} = ?

   j) Find $L^{-1}\left\{\frac{1}{s(s+2)}\right\}$ = ?

[P.T.O.]

2 a) If V be a vector space of n-tuples, and $v_1, v_2, \ldots, v_k \in V$, then prove that the collection of all possible linear combination is a subspace of V. [8

b) State and prove Schwarz's inequality. [8

3. a) Find the fourier series of $f(x) = x + |x|, \ -\pi < x < \pi$ [8

b) Test the linear dependency of the vectors (2, 1, 8,9), (3, 2, 2, 12), (4, 3, 4, 3). [8

4. a) Find the half range cosine series for [8

$$f(x) = \begin{cases} x, & 0 < x < \pi/2 \\ \pi - x, & \frac{\pi}{2}, < x < \pi \end{cases}$$

b) Find the fourier integral for [8

$f(x) = e^{-x}$, $x > 0$

$= 0$, elsewhere.

5. a) Find the fourier cosine transform for [8

$$f(x) = \begin{cases} 1 \ of \ 0 < x < 1 \\ -1 \ of \ 1 < x < 2 \\ 0 \ of \ x > 2 \end{cases}$$

b) Find the Fourier sine transform of

$$f(x) = \begin{cases} x^2, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$$ [8

6. a) Prove that $\Gamma(1/2) = \sqrt{\pi}$ [8

b) Evaluate $\int_0^1 \sqrt[5]{x \ln\left(\frac{1}{x}\right)}.dx$ [8

7. a) Find Laplace Transform of [4+4

(i) $e^{3t} \sin^2 2t$ (ii) $t^2 \cos 2t$

b) Find inverse Laplace transform of [4+4

(i) $\frac{1}{(s+1)(s+3)(s-5)}$

(ii) $\frac{1}{s^2(s+3)}$

8. a) Find inverse Laplace Transform using convolution for $\frac{s}{(s^2+a^2)(s^2+b^2)}$ [8

b) Solve the integral equation [8

$$y(t) = 1 - \sinh t + \int_0^t (1+u)\, y(t-u)\, du$$

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