

No. of Pages: 2

GACR

+3, 5th SEMESTER END EXAMINATION-2018
(COMMERCE)

Sub.- Principles of Marketing
PAPER : Core-12

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. Explain the following terms briefly. (any EIGHT) [2 x 8]
- Social Marketing concept
 - Consumer Behaviour
 - Mass Marketing
 - Shopping Products
 - Penetrating pricing policy
 - Sales Promotion
 - Physical distribution.
 - Retail vending machine
 - Rural market
 - Green Marketing

Answer any FOUR.

- Discuss the nature & scope of marketing. [16]
- What do you mean by a new product? Discuss various stages of new product development [16]
- What do you mean by pricing? Discuss the various factors that affect pricing decisions. [16]

P.T.O.

5. What factors affect the selection of appropriate distribution channels for a company's product? Explain them briefly giving suitable examples. [16]
6. a) Differentiate between product differentiation & market segmentation. [8+8]
b) Write a note on importance of rural market in India.
7. Write short notes on the following [4x4]
a) Advertising
b) Personal selling
c) Online marketing
d) Services marketing
8. Write short notes on: [8+8]
a) Marketing Mix
b) Changing retailing scenario in India



No. of Pages: 2

GACR
+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)
Sub.- ECONOMICS
(PAPER : C-XII)

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 questions of the following.
- a) Define Economic Development.
 - b) Define Real National Income. [8 x 2]
 - c) Define production function.
 - d) What is innovation's of Schumpeter's?
 - e) Define warranted Growth Rate .
 - f) Define endogenous Growth.
 - g) What is poverty.
 - h) Define important features of the poor.
 - i) What is state ownership?
 - j) What is Economic Growth

Answer any 4 questions.

- 2. Explain obstacles to Economic development. [16]
- 3. Explain important reasons for Low Rate of capital formation. [16]

P.T.O.

4. Critically examine the Rostow theory of growth. [16
5. Critically examine the Schumpeter's theory of development. [16
6. Explain briefly evidence on the determinants of growth. [16
7. Explain the mechanism that generate poverty traps and path dependence of growth process. [16
8. Explain critically important determinant's of democracy. [16



+3, 5th SEMESTER EXAMINATION-2018
(ARTS)

Sub: ENGLISH

Full Marks: 80

Paper: CORE-XII

Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

SECTION-A

[6x5]

Answer all questions.

1. Who is Carudatta? What are the stolen jewels?

OR

Who is Vasantasena? Why does Carudatta fall in love with her?

2. What was Maharshi *Durvasav*'s Curse?

OR

Who accompanied Sakuntala to the palace?

3. What is *Rasa*? Write a short note.

OR

What is *Bhava*? Write a short note.

4. Why was Rama popular among citizens?

OR

What did King Dasaratha decided to do?

5. Write short note on any ONE of the following.

(a) *Veda*

(b) *Hymns*

(c) *Suktas*

(d) *Mandalas*

(P.T.O...)

[2]

SECTION-B

Answer all questions.

[10x5]

1. Analyse the character of 'Carudatta'?

OR

Critically appreciate the play '*Mrcchakatika*, Act-I'.

2. How flora and fauna are personified in Act-IV of '*Abhijnanasakuntalam*'.

OR

What advise did *Sakuntala* receive from *Maharishi Kanva* on her departure?

3. Discuss different types of *Rasa*.

OR

Discuss different types of *Bhavas*.

4. Discuss the role of 'Kalikeyi' in Rama's exile.

OR

Summarize "Canto 1: Impending Coronation", The Ramayana of *Valmiki*.

5. Discuss any one of the following Vedic Literature

(a) *Purusha Sukta Yajur Veda XV. XXXI. 1-16.*

(b) *Shivasankalpa Sukta Yajur veda XXX.1.6.*

(c) *Samjnana Sukta Rig Veda X.19.*

- x - x - x -

No. of Pages: 2

GACR

**+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)**

Sub.- Education

PAPER : Core- XII

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. [2 x 6]
- Herodotus (484-425 B.C.) as a pioneer of comparative education belongs to which phase of historical development of comparative education?
 - What is the task of an investigator in the 'juxtaposition' stage of studying comparative education ?
 - In which type of economic order only rich people access to education?
 - Which educational body devised 'Three Language Formula' in India for the first time?
 - GCSE programme in UK is meant for students of which age group ?
 - Who is the administrative head of American education system?
 - 'The compulsory Education' law in China ensures education of children for how many years?
 - What is MEXT in context of educational administration in Japan?

P.T.O.

Answer any FOUR questions.

2. Discuss different approaches to study comparative education. [12
3. Explain various stages of Area Study Method of comparative education. State the limitation of the method.
4. What are the purposes of studying comparative education ? [8+4
5. How geographic and economic factors determine the educational system of a country ? [6+6
6. Write short notes on the following concepts within 100 words. [6+6
 - a) Structure of education in USA.
 - b) Types of educational institutions in UK.



+3, 5th SEMESTER END EXAMINATION-2018

(ARTS)

Sub.-HINDI

PAPER :Core-XII

Time: 3 Hours

Full Marks : 80

The figure in the right hand margin indicate marks.

(भारतीय काव्यशास्त्र)

(Answer FIVE questions. Question No. 1 is compulsory for all and students have the option to attend any FOUR from the rest of SEVEN questions.)

1. निम्नलिखित प्रश्नों में से किन्हीं आठ के वस्तुनिष्ठ उत्तर दीजिए। [2x8]
- क) “रमणीयार्थ प्रतिपादकः शब्द काव्यम्” - यह काव्य लक्षण किसने दिया है?
- ख) “काव्य प्रकाश” का रचयिता कौन है?
- ग) “साहित्यदर्पण” किसने लिखा है?
- घ) व्यंजना के दो भेदों का नाम बताइए।
- ङ) भरतमुनि के अनुसार रस के किन्ही दो अंगों के नाम बताइए।
- च) “रीतिरात्मा काव्यस्य” किसने कहा है?
- छ) रीति के किन्ही दो भेदों के नाम बताइए।
- ज) किन्ही दो शब्दालंकारों के नाम बताइए।
- झ) उपमा अलंकार के किन्ही दो भेदों का नाम बताइए।
- ञ) छंद कितने प्रकार के हैं? उनके नाम बताइए।

[P.T.O.]

2. कवि क्यों लिखता है ? इस विषय पर भारतीय आचार्यों द्वारा प्रतिपादित मतों का उल्लेख करते हुए अपने विचार प्रस्तुत कीजिए। [16]
3. रस की परिभाषा देते हुए रस के अंगों का विवेचन कीजिए। [16]
4. “रीति सिद्धांत” का सामान्य परिचय देते हुए रीति के विविध भेदों पर अपने विचार प्रस्तुत कीजिए। [16]
5. अलंकार का स्वरूप निर्धारित करते हुए यह स्पष्ट कीजिए कि क्या वे काव्य के अनिवार्य तत्त्व हैं? [16]
6. निम्नलिखित में से किन्हीं दो पर टिप्पणियाँ लिखिए। [2x8]
- क) व्यंजना शब्दशक्ति
ख) काव्य मे रस का महत्व
ग) रीति और शैली में अंतर
घ) शृंगार रस



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GACR
+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)

Sub.- History
PAPER : Core- XII

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]
- a) Invasion of Nadir Shah
 - b) Mercantilism
 - c) Battle of Buxar
 - d) Maharaja Ranjit Singh
 - e) Treaty of Deogaon
 - f) Pitt's India Act
 - g) Ilbert bill controversy
 - h) Wood's Despatch of 1854
 - i) Impact of westernisation on rural society
 - j) Shifting cultivation in the mid 18th century.
 - k) Dadabhai Naoroji
 - l) Role of Mangal Pandey in the 1857 uprising.

Answer any FOUR questions.

2. Make a brief note on the social condition of India in the mid 18th century A.D. [16

P.T.O.

[2]

OR

Throw light on the political condition of India in the mid 18th century A.D.

3. Discuss the consolidation of colonial power in India. [16

OR

Make a note on the Anglo-Bengal war.

4. Briefly discuss the army, police and law of the colonial state. [16

OR

How the indigeneous education countered the western education.

5. Prepare a short note on [8x 2
- a) Commercialisation and indebttness
 - b) Drain of wealth

OR

India's economy became a source for the empire building of British. Justify it.

6. Wrtie short notes on ; [8x 2
- a) Santal Upring (1856-57)
 - b) The Deccan Riots

OR

Briefly discuss the causes and consequences of the Great upring of 1857



GACR
+3, 5th SEMESTER EXAMINATION - 2018
(ARTS)
ODIA (Core -XII)

Time : 3 Hours

Full Marks : 80

ପ୍ରଥମ ପ୍ରଶ୍ନ ସହିତ ଅନ୍ୟ ଯେକୌଣସି ଚାରିଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ
The figure in the right hand margin indicate marks.

(୮×୨)

୧. (ଯେ କୌଣସି ୮ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ)

- (କ) ପ୍ରଥମ ଓଡ଼ିଆ ଉପନ୍ୟାସ କ'ଣ? ଏହା କେବେ ରଚିତ ହୋଇଥିଲା?
- (ଖ) ଫକୀରମୋହନଙ୍କ ଦୁଇଟି ଉପନ୍ୟାସର ନାମ ଲେଖ ।
- (ଗ) ପ୍ରଥମ ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପ କ'ଣ? ଏହାର ରଚୟିତା କିଏ?
- (ଘ) ନିଧୁ ଦାସ କିଏ?
- (ଙ) 'ଲକ୍ଷ୍ମୀର ଅଭିସାର' ଗଳ୍ପର ମୁଖ୍ୟ ଚରିତ୍ର କିଏ?
- (ଚ) 'ହୋଲି' ଗଳ୍ପରେ ପ୍ରତିଫଳିତ ଲେଖକୀୟ ବାଉଁଶକୁ ସଂକ୍ଷେପରେ ଉଲ୍ଲେଖ କର ।
- (ଛ) "ଅଜାଗା ଘା' ଦେଖୁ ହୁଏ ନାହିଁ କି ଦେଖାଇ ହୁଏ ନାହିଁ"- ହରି ସିଂ ମନକୁ ଏଧାରଣା ଆସିବାର ତାତ୍ପର୍ଯ୍ୟ କ'ଣ?
- (ଜ) ଗୋପାଳ ବାବୁ ଶୋଇବାରେ ହରକତ ହୋଇ ପିଅନକୁ କ'ଣ ହୁକୁମ ଦେଲେ?
- (ଝ) ଦେବକୀ ଗଉଡୁଣୀକୁ କେଉଁ ନାଁରେ ଡାକିଲେ ସେ ବଡ଼ ଖୁସି ହୁଏ?
- (ଞ) ଅନନ୍ତର ବାପା ଓ ମା'ର ନାମ କ'ଣ?

ପୃଷ୍ଠା ଓଲଟାଅ.

(ନିମ୍ନୋକ୍ତ ଯେକୌଣସି ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ)

୨. ଓଡ଼ିଆ ଉପନ୍ୟାସର ସ୍ୱରୂପ ନିର୍ଣ୍ଣୟ କରି ବିକାଶ କ୍ରମକୁ ଦର୍ଶାଅ ।
୩. ସ୍ୱାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପର ବିକାଶକ୍ରମ ସଂପର୍କରେ ଆଲୋଚନା କର ।
୪. 'ଶାସ୍ତି' ଉପନ୍ୟାସର ଚରିତ୍ରିକ ବିଶ୍ଳେଷଣ କର ।
୫. 'ରାଣ୍ଡିପୁଅ ଅନନ୍ତା' ଗଳ୍ପର ସାମାଜିକ ଆଭିମୁଖ୍ୟ ସଂପର୍କରେ ଆଲୋଚନା କର ।
୬. ରାଜନୈତିକ ଉପନ୍ୟାସ ଭାବରେ 'ଅକ୍ଷୟଗନ୍ଧ'ର ମୂଲ୍ୟାଙ୍କନ କର ।
୭. 'ନୀଳମାଷ୍ଟରାଣୀର ଜୀବନ ଏକ ହୃଦୟ ବିଦାରକ ମର୍ମଲିପି'
- ଆଲୋଚନା କର ।
୮. 'ଅନ୍ଧାରୁଆ' ଗଳ୍ପର ନାମକରଣ ସାର୍ଥକତା ପ୍ରତିପାଦନ କର ।

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GACR
+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)
Sub.- PSYCHOLOGY
PAPER : Core-XII

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 questions. [2 x6
 - a) Discuss any **two** goals of health psychology.
 - b) What is primary prevention?
 - c) Discuss briefly about compliance.
 - d) Write a short note on AIDS.
 - e) What is depression.
 - f) Briefly discuss about any **two** causes of ADHD.
 - g) What is Osteoporosis?
 - h) What is diet management?
2. Answer any FOUR questions. [12 x 4

What is health psychology? Explain bio-psychological perspective of health.
3. What is stress? Discuss different steps to manage stress.
4. What do you mean by wellness? Describe the techniques of promoting wellness.

P.T.O.

[2]

5. Discuss the health belief model and Leventhal's self-regulatory model on the context of improving the condition of health.
6. Define coping. Discuss how to cope during the crises of illness.
7. Explain immunization as a successful technique of the primary prevention of the disease.
8. Write short notes on: [6 x 2]
 - a) Yoga
 - b) Exercise.



No. of Pages: 2

GACR

**+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)**

Sub.- Philosophy

PAPER : Core -XII

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 Anarchy
 - ii) What Plato says in his book Republic about justice.
 - iii) Define Humanism.
 - iv) What do you mean by Human Right?
 - v) What is secularism?
 - vi) Write two statements which constitute the basis of theory of feminism.
 - vii) How J.S. Mill regards Liberty?
 - viii) By equality what Laski means?
 - ix) Sarvodaya is compared and contrasted with which western philosophy
 - x) Who was the pioneer of Sarvodaya?

P.T.O.

Answer any FOUR questions.

[16 x4

2. Define Human Right and describe universal declaration of Human Rights.
3. Critically examine the broad application of feminism in the present scenario.
4. Explain “ Anarchism is utter lawlessness”.
5. Write short notes on:
 - a) Mechanical society
 - b) Organic society
6. Write short notes on:
 - a) Problems of equality
 - b) Democratic Government
7. Write short notes on:
 - a) Humanism
 - b) Secularism
8. Write short notes on:
 - a) Sarvodaya
 - b) Human Rights in theory and practices.



No. of Pages: 2

GACR

**+3, 5th SEMESTER END EXAMINATION-2018
(ARTS)**

**Sub.- Political Science
PAPER : Core -XII**

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]
- What is *Rajadharma* ?
 - Who was *Vedavyasa* ?
 - Why *Manu* is considered as a world teacher ?
 - What is the executive duty of the king as prescribed by *Kautilya* ?
 - What is *Sutta* ?
 - Mention two important writings of Jiauddin Barani.
 - What was Wal's court under the Sultanate of Delhi?
 - Who was Abul Fazal?
 - In which of the works of Abul Fazal the theory of monarchy figures ?
 - Who had translated one hundred poems of Kabir in English and in which year ?

P.T.O.

Answer any FOUR questions.

2. How did Islam become an important and sociologically very meaningful cultural tradition of India? [16]
3. Write short notes on: [8 x2]
 - a) Rajadharmanusansana parva
 - b) Life sketch of *Vedavyasa*.
4. Explain Manu's idea on the king and his duties. [16]
5. Analyse *Kautilya's* idea on Saptanga theory. [16]
6. Write short notes on: [8 x2]
 - a) Beginning of life on Earth according to *Buddha*.
 - b) *Buddha's* theory on kingship
7. Explain the theory of kingship as viewed by Ziauddin Barani. [16]
8. Write short notes on:
 - a) Abul Fazal's theory of Monarchy
 - b) Syncretic ideas of Kabir. [8 x2]



+3, 5th SEMESTER EXAMINATION-2018

(ARTS)

Sub: SOCIOLOGY

Full Marks: 80

Paper: CORE-XII

Time: 3 Hours

Answer the questions as per instruction.

The figure in the right hand margin indicate marks.

Answer any EIGHT of the following.

[2x8]

1. Highlight two main causes of agrarian unrest or peasant movement.
2. Highlight two main causes of Tebhaga movement.
3. Define social movements.
4. Mention any two characteristics of social movement.
5. Who is the founder of Brahma Samaj?
6. Who is the founder of Arya Samaj?
Highlight two causes of Mahar movement in Maharashtra.
7. Highlight two causes of Bardoli movement in Gujarat.
8. Mention two causes of the Non Brahmin movement in Tamil Nadu.
9. Highlight any two aims and objectives of the Champaran Satyagraha.
10. Highlight any two aims and objectives of the SNDP movements in Kerala.
11. Mention any two women's movements in pre independence era.
12. Mention any two women's movement in past independence era. [5]
13. Mention any two major basis of social movements. [7]
14. Mention any two approaches to land reform?
15. Mention any two causes of failure of land reforms in India.

(P.T.O...)

Answer any FOUR of the following.

[16x4]

1. Elaborate the characteristic of peasant and Agrarian society.
2. Examine the impact of land reforms on Indian rural society.
3. "Globalisation has proved to be anti agricultural in India comment.
4. Define social movements and discuss its characteristics.
5. Discuss the major basis of social movements in India.
6. Discuss women's movement in the pre-independence and post independence period.
7. Highlight the causes and consequences of Mahar movement in Maharashtra.
8. Mention the major causes of the Tebhaga movement in Bengal.

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GACR

+3, 5th SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- CSC

PAPER : Core-XII

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 . [2 x 6
- a) Write the limitation of waterfall model.
 - b) What is the difference between α -Test and β -Test.
 - c) Write the difference between software validation and verification.
 - d) What is blackbox testing.
 - e) How cohesion and coupling are related?
 - f) What is the use of use case diagram in software design.
 - g) Mention the activities involved in object oriented analysis.
 - h) What is RAD Model.

Answer any FOUR.

2. a) Identity six different phases of a classical waterfall model. [6
- b) Write the advantages of spiral model. [6
3. a) Identify at least two activities carried out during each phase of a spiral model. [6

P.T.O.

- b) Explain the concept of extreme programming. [6]
- 4. a) What is functional requirement and non-functional requirement of SRS document. [6]
- b) Prepare SRS document for library management system. [6]
- 5. a) What is cohesion? What are the different classes of cohesion? [6]
- b) Identify four characteristics of a good software design techniques. [6]
- 6. a) Draw a use case diagram for online shopping system. [6]
- b) Write short notes on [6]
 - i) Association
 - ii) Aggregation[6]
- 7. a) Explain two main approaches to design black box test cases. [6]
- b) What are the main categories of risk which can affect a software project? [6]
- 8. a) What are the principal properties of dependability? [6]
- b) Describe risk driven specification process and its stages. [6]



No. of Pages: 2

GACR

+3, 5th SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- ETC

PAPER : Core- XII

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 . [2 x 6]
- Define transmission efficiency of an AM wave.
 - What is the need for modulation?
 - State the application of different AM system.
 - What is frequency transmission.
 - Define SNR (Signal to noise ratio).
 - What is image frequency?
 - Explain the single polarity.
 - Draw the circuit diagram of Ring modulator.

Answer any FOUR.

- Derive the equation and power relation of a single tone modulation of AM system. [6]
 - Draw the diagram and explain working of FDM systems. [6]
- Explain about diagonal clipping in a diode detector. How it can be eliminated. [6]

P.T.O.

- b) Explain in detail about NBFM vs WBFM [6]
4. a) With a neat block diagram, explain the operation of frequency division multiplexing technique. [6]
- b) Briefly explain SSB-Sc vs. DSB - Sc generation. [6]
5. a) Explain the comparison between FM and PM techniques. [6]
- b) What is noise? Explain the difference between External noise and internal noise. [6]
6. a) Discuss the effects of feedback on the performance of AM transmitter. [6]
- b) Draw the AM superhetrodyne receiver and explain the importance of each functional unit. [6]
7. a) Define amplitude demodulation. Give merits and demerits. [6]
- b) List out the methods of generation of SSB-Sc signal and explain any one of the method in detail. [6]
8. Write short notes on (any TWO): [6 x 2]
- a) Communication channels
- b) Balanced modulator
- c) Pilot carrier modulation
- d) Noise factor.



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GACR

+3, 5th SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- BOTANY

PAPER : Core-XII

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'

[2 x 6

1. Answer any SIX .
 - a) Define chelating agents with examples.
 - b) Explain transmembrane pathway
 - c) Describe root pressure
 - d) Deficiency symptoms of Mg.
 - e) Define symport.
 - f) What is triple response.
 - g) Explain Richmond & Long's effect.
 - h) Describe importance of vernalization.

Section - 'B'

Answer any FOUR.

2. Explain mechanism of stomatal transpiration in higher plants. [12
3. Describe the process of translocation of solutes in plants.

P.T.O.

4. What is mineral nutrition? Explain specific roles and deficiency symptoms of micronutrients. [12]
5. Discuss transport of ions across cell membrane in plants. [12]
6. Describe discovery, chemical nature & physiological roles of auxin. [12]
7. Describe Photomorphogenesis . Discuss role of phytochrome in photomorphogenesis. [12]
8. Write short notes on:
 - a) Photoperiodism [6x2]
 - b) Seed dormancy



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GACR

**+3, 5th SEMESTER END EXAMINATION-2018
(SCIENCE)**

Sub.- Zoology

PAPER : Core - XII

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 questions. [2 x6]
- Write a brief note on RNA priming.
 - Explain Wobble hypothesis.
 - What is RNA editing?
 - Explain gene silencing?
 - How genetic code was deciphered?
 - Write short note on the Clover leaf model of t-RNA.
 - Give a brief note on central dogma.
 - Write a short notes on DNA topoisomerases.

Answer any FOUR.

- Define opson. Explain the opson model of gene regulation using lac upson of F. coli as an example. [12]
- Explain the mechanism of DNA replication in prokaryotes. [12]
- Give an account of the salient features of Watson and Crick model of DNA. [12]

P.T.O.

[2]

5. Describe in detail about the mechanism of transcription in prokaryotes. [12]
6. Give an account of RNA splicing mechanisms. [12]
7. Describe the characteristics of Genetic Code. [12]
8. Write short notes on : (any TWO) [6x 2]
 - a) Split genes
 - b) Tryptophan operon
 - c) M-RNA & S-RNA



No. of Pages: 2

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+3, 5th SEMESTER END EXAMINATION-2018

(SCIENCE)

Sub.- STATISTICS

PAPER : Core - XII

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 . [2 x 6
- In Life Insurance, Vital statistics is utilised by the _____ .
 - The range of vital index is _____ to _____ .
 - An abridged life table usually consists of ages at distance of _____ years.
 - Merrel's methods of construction of abridge life table is mainly based on _____ .
 - Explain uses of vital statistics.
 - Define crude death rate.
 - Define infant mortality rate.
 - What do you mean by Abridged life table.

Answer any FOUR.

[12

2. Define vital statistics? What are various uses of vital statistics for a country and how to define rates and ratios of vital events. [6+6
3. a) What are the weakness of registration of vital statistics in India.

P.T.O.

- b) What steps have been taken to improve the registration system of vital statistics. [12]
4. Explain sampling registration system for collecting vital statistics? What are the lacunae of sample registration system.
5. Explain direct and indirect method of standardisation death rates and also explain its merits, demerits and uses of standardisation.
6. What do you mean by life table? State the meaning of various columns of a life table and explain how a life table can be constructed from data usually available. Explain its uses.
7. Why is an abridged life table prepared? Enumerate the columns of an abridged life table and describe the steps in their construction.
- 8 a) What are various coefficient used for measuring fertility? Discuss their merits. Explain the factors which affect fertility.
- b) The number of persons dying at age 75 is 476 and complete expectation of life at 75 and 76 years are 3.99 and 3.69 years. Find the numbers living at ages 75 and 76.



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+3, 5th SEMESTER END EXAMINATION-2018
(SCIENCE)

Sub.- Probability & Statistics (MTC)
PAPER : CORE-XII

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. [2 x 8]
- a) Find the probability of getting a sum of 3 in rolling of 3 dice once.
 - b) If $E(x) = 3$ then find $E(2x+3) = ?$
 - c) Which distribution has same mean and variance and what is its value?
 - d) State the distribution function of Geometric distribution.
 - e) State the condition for which Normal distribution can be standardized.
 - f) If $E(X) = E(Y) = 5$ than $E(3X+4Y) = ?$
 - g) What is the moment generating function of binomial distribution? Find its mean.
 - h) Define correlation coefficient.
 - i) State Mrkov's inequality.
 - j) State central limit theorem.

Answer any FOUR.

2. a) If A and B are independent then prove that A' & B' are independent where A' = complement of A, B' = complement of B. [8]

b) An integer is chosen from the set {1,2,---, 200}. What is the probability that the number is divisible by 2 or 3 ? [8]

3. a) Two players A and B throws a pair of dice. A wins if he throws a sum of 5 before B throws 8. What is the probability of winning of A if A starts the game? [8]

b) For what values of K does the function [8]

$$f(x) = \begin{cases} Kx(1-x), & 0 \leq x \leq 1 \\ 0, & \text{elsewhere} \end{cases}$$

is a probability density and hence find its mean.

4. a) Find the mean and variance of poisson's distribution. [8]

b) Find the probability of getting at least 8 heads in 12 tosses of a coin. [8]

5. a) Define uniform distribution and find its mean and variance. [8]

b) For what value λ does the function [8]

$$f(x,y) = \begin{cases} \lambda xy, & x = 0, 1, 2, y = 1, 2, 3 \\ 0, & \text{otherwise} \end{cases}$$

is a probability distribution. Find the joint mean.

6. a) Find the value of correlation coefficient for the data : [8]

X	14	18	23	27	35	48
Y	17	29	42	57	73	98

b) Find the regression line of X on Y for the data. [8]

X	4	5	6	7	8	10
Y	8	12.5	18	24.5	32	45

7. a) State weak and strong law of large numbers with applications. [8]

b) State and prove central limit theorem for independent random variables. [8]

8. Write short notes (Any TWO) [8+8]

a) Co-Variance

b) Normal Distribution

c) Markov Chains.



GACR
+3, 5th SEMESTER END EXAMINATION-2018
(SCIENCE)
Sub.- **MATHEMATICS**
(PAPER : C-XII)

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. [2 x 8

a) Find the probability of getting a picture card in drawing of a card from a pack.

b) If $f(x) = \frac{x}{10}$, $x=0, 1, 2, 3, 4$, then test it is a probability distribution or not? Justify your answer.

c) What is the probability of getting exactly 3 heads in 8 tosses of a coin.

d) Write down the density function of normal distribution.

e) Define joint probability distribution.

f) If A and B are independent events with

$$P(A) = \frac{1}{2}, P(B) = \frac{1}{3} \text{ then find } P(A \cup B)$$

g) Prove that $f(x, y) = \begin{cases} \frac{2}{3}(x + y), & 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & , \text{ otherwise} \end{cases}$

is a joint probability density.

[2]

- h) Prove that geometric mean of regression coefficients is correlation coefficient.
- i) State strong law of large numbers.
- j) State Chebyshev's inequality.

Answer any FOUR.

2. a) For what value of λ does the function [8

$$f(x) = \begin{cases} \frac{kx}{6}, & x=1,2,3 \\ 0, & \text{elsewhere} \end{cases} \text{ is a mass function .}$$

Find E (x).

- b) Find the mean and variance of the probability [8

$$\text{density } f(x) = \frac{1}{2}e^{-|x|}, -\infty < x < \infty.$$

3. a) Prove that Binomial distribution is a discrete [8

- b) Find the moment generating function of poisson's [8

4. a) Prove that mean deviation from the mean for [8

normal distribution is equal to $\frac{4}{5}$ of standard deviation approximately.

- b) Prove that $f(x, y) = xe^{ax(y+1)}, x \geq 0, y \geq 0$ is a joint [8

[3]

5. a) Find the correlation coefficient for [8

x	1	3	4	8	9	11	13
y	1	2	4	5	7	8	9

- b) Find the lines of regressions for [8

X	1	2	3	4	5	7
Y	2	5	6	8	9	11

6. a) Use Chebyshev's inequality to find a lower bound [8

on $P(-4 < X < 20)$ where the random variable X has the mean $\mu=8$ and variance $\sigma^2=9$.

- b) Two unbiased dice are thrown. If X is the sum of [8

$$P(|X - 7| \geq 3) \leq \frac{35}{34}$$

7. a) Find the poisson's approximation to Binomial [8

- b) If X is a random variable with mean μ and variance

$$\sigma^2 \text{ then prove that } P(|x - \mu| \geq k\sigma) \leq \frac{1}{k^2}. \quad [8$$

8. Write short notes on any TWO.

- a) Chapman-Kolmogorov Equation. [8+8
- b) Markov Chain
- c) Cumulative distribution function
- d) Variance & Co-variance.



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+3, 5th SEMESTER END EXAMINATION-2018
(SCIENCE)
Sub.- PHYSICS
PAPER : Core-XII

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.

- [2 x 6]
1. Answer any SIX of the following.
- a) Explain the law of mass action in solid state physics.
 - b) Sketch (111) plane in a simple cubic unit cell.
 - c) Determine the Miller indices of a plane that makes intercepts of $4A^\circ$, $3A^\circ$ and $8A^\circ$ on the coordinate axes of an orthorhombic lattice with the ratio of the axial lengths as: $a : b : c = 2 : 3 : 1$
 - d) Write the expression for the Fermi-Dirac distribution function and discuss its behaviour with the change in temperature.
 - e) What is Fermi energy? Write the relation between average kinetic energy of an electron and Fermi energy at absolute zero.
 - f) The conductivity of metals decreases while that of semiconductors increases with rise in temperature. Explain.

P.T.O.

- g) Explain the following terms briefly.:
- i) Hysteresis
 - ii) Coercivity
 - iii) Remnance
- h) What is Meissner effect?

Answer any FOUR.

[12x4]

2. Explain the following terms used in crystallography. [12]
- a) Bravais lattice
 - b) Raciprocal lattice
 - c) Atomic scattering factor
3. Discuss the Debye model of lattice heat capacity. What is Debye T^3 law? [12]
4. a) What are paramagnetic and ferromagnetic materials? Give examples. [3]
- b) Discuss the Langevin's theory for a paramagnetic gas and obtain an expression for the paramagnetic susceptibility of the gas. [9]
5. a) What is Hall coefficient? Determine the Hall coefficient for p-type semiconductor. [9]
- b) Describe an experimental set-up for the measurement of the Hall voltage. [3]
6. a) What is meant by polarization mechanism in dielectrics? Discuss the different types of polarization mechanism in dielectrics. [4]

- b) Derive the Clausius-Mosotti equation and explain how it can be used to determine the dipole moment of a polar molecule from the dielectric constant measurements. [8]
7. a) Define critical field and critical temperature in a superconductivity. [4]
- b) Explain the difference between type *I* and type *II* superconductors. Explain how does the critical magnetic field vary with temperature in Type *I* and Type *II* superconductors. [8]
8. a) Describe the advantage of a four-level laser system over a three-level system. [4]
- b) Discuss the working of helium-neon laser. [8]



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GACR
+3, 5th SEMESTER END EXAMINATION-2018
(SCIENCE)

Sub.- CHEMISTRY (Hons.)

PAPER : Core- XII

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

1. Answer any SIX questions.

[2 x6

- a) Explain uncertainty principle.
- b) What are the conditions to be satisfied for the Atomic orbitals to form Molecular orbitals?
- c) What is Born-Oppenheimer Approximation?
- d) Between HCl and O₂ which molecule will show rotational spectra and why?
- e) What is the value of one Einstein in calorie per mole?
- f) Give two examples of photosensitization reaction.
- g) Why electronic spectrum of a molecule is called band spectrum?
- h) Calculate the degree of freedom of water molecule.

P.T.O.

[2]

Group - B

Answer any FOUR questions.

2. a) Derive the expression for energy for the particle in a one - dimensional box. [8]
 b) How can you justify : [2 +2]
 i) Quantisation of energy
 ii) In what condition the energy of a free particle is not quantised ?
3. a) Discuss simple harmonic oscillator model of vibrational motion in detail. [8]
 b) What is vibrational zero point energy? The vibrational frequency of a diatomic molecule is 2000 cm^{-1} . Calculate the zero point energy. [4]
4. a) Normalised and orthogonal wave functions. [6]
 b) How the different combination of values of n_x , n_y and n_z may give the same value of energy? [6]
5. How LCAO-MO treatment of H_2^+ ion leads to the concept of Bonding and Antibonding Molecular orbital? Explain in detail diagrammatically [12]
6. Discuss the molecular orbital diagrams of hetero atomic molecule like HF, H_2O and BeH_2 . [12]
7. a) Discuss in detail the electronic transition in σ , π , and η molecular orbitals. [8]
 b) Selection rule [4]

[3]

8. a) Grothus Draper law and Stark-Einstein law [6]
 b) How the quantum yield of a photochemical reaction is determined by actinometer? [6]

 H_2^+