GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- EDUCATION
PAPER : 303

Time: 4 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   [2 x 5

1.   **Answer any SIX of the following.**

a) Distinguish between special education and integrated education.

b) Differentiate between inclusive and integrated education.

c) Distinguish between handicap and impairment.

d) Write any two characteristics of Hearing impaired.

e) Write any two characteristics of visually impaired.

f) Write the concept of mental retardation.

g) What is inclusive Education?

h) Write any two causes of Mental retardation.

Group - B

Answer any FOUR questions.

[12x 4

2. Describe the historical background of special education.

3. Describe the aims and objectives of inclusive Education.

4. Describe the role of teacher in educating the visually impaired child.

5. Develop a checklist for identifying hearing impaired children.

6. Describe how a teacher can teach educable mentally retarded children in integrated setting.

7. Describe different types of teaching aids used for the care and training of special learners.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- ECONOMICS   Time: 4 Hours

PAPER : 303   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** [2 x 8

a)   International cartel

b)   Gains from trade

c)   Terms and trade

d)   Absolute advantage

e)   Balance of trade

f)   Customs Union

g)   Brexit

h)   USA-China trade war

i)   International transfer of technology

j)   Internet vs Intranet

   Answer Any FOUR questions.   [16x4

2.   Explain Heckscher - Ohlin theory of trade.

OR

What are the various factors affecting international trade of India.

P.T.O.

3.   What is comparative cost advantage? Explain with example.

OR

Explain factor price equilisation theory.

4.   Write short notes on:

   i)   Kravi's theory of availability

   ii) Linder's theory

OR

What is product cycle theory of Vernon? Give examples.

5.   Explain foreign trade multiplier.

OR

Impact of dumping has been enoromous on developing countries. Give your opinion about the statements.

6.   What is mail merge? How is it performed? What are the benefits of it?

OR

Write short notes on:

   i)   Watermark in word file

   ii) Wrap text, merge and center in excel file.

   iii) Slide sorter in power point.

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Sub: HINDI　　　　　　　　　　Full Marks: 80

Paper: 303　　　　　　　　　　Time: 4 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Question No. 1 is mandatory.

१. **निम्नललिखित प्रश्नो में से किन्ही आठ प्रश्नों के उत्तर लिखिए।** [2x8]

(क) मैथिलीशरण गुप्त की नारी-दृष्टि की किन्ही दो विशेषताओं को लिखिए।

(ख) "उस असीम का सुन्दर मेरा लघुतम जीवन रे" महादेवी की इस उक्ति का क्या तात्पर्य है ?

(ग) कामायनी में मनु की चिंता के मुल कारण है ?

(घ) इडा किसका प्रतिक है ?

(ङ) राम-रावण के युद्ध में पहले दिन क्या हुआ ?

(च) "होगी जय, होगी जय, हे पुरुषोत्तम नवीन" यह किसकी उक्ति है ?

(छ) मुक्तिबोध ने "चाँद" को किसका प्रतिक माना है ?

(ज) "असाध्यवीणा" का निर्माण कैसे हुआ था ?

(झ) उर्वशी धरती पर क्यों आयी है ?

(ञ) उर्वशी की दृष्टि में प्रेम क्या है ?

निम्नललिखित चार प्रश्नो का उत्तर लिखिए।　　　[16x4]

२. "साकेत" नवम् सर्ग की काव्यगत विशेषताओं की आलोचना कीजिए।

३. महादेवी वर्मा की कविताओं के भाव-पक्ष का विश्लेषण कीजिए।

४. "कामायनी" के "श्रद्धा" सर्ग के आधार पर जयशंकर प्रसाद की सौंदर्य-दृष्टि की विशेषताओं का विवेचन कीजिए।

५. "चांद का मुँह टेढा है" कविता में मुक्तिबोध मूल विचारों को स्पष्ट कीजिए।

६. "कामाध्यात्म" की कविता के रूप मे "उर्वशी" का मुल्यांकन कीजिए।

७. "असाध्य वीणा" कविता का प्रतिपाध्य स्पष्ट कीजिए।

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- HISTORY   Time: 4 Hours

PAPER : 303   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

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

   a) Who was James Argustus Hickey? Write the name of Newspaper edited by him.

   b) During whose Governor Generalship the first Christian missionary was established by Marshman and Carey and where it was established?

   c) Who was the founder of theosophical society and who made this movement popular in India?

   d) Who led Non-Brahmin movement in Tamilnadu and what was the name of this movement?

   e) In which year Sati practice was abolished by law and who opposed Rammohan Ray against his movement for abolition?

   f) Who was Charles Wood and in which year the famous Wood's despatch was prepared?

   g) Who was Jyotiba Phule and why he is famous for?

   h) Which movement was started by Sir Syed Ahmad Khan and write the name of the college started by him?

P.T.O.

i) Who started Ramkrishna Mission and in which year he participated in the world parliament of Religion?

j) What was Mahad movement and who led this movement.

k) Who established the 'Sri Narayan Paripalana Yogam' and to which community did he belong?

Group - B [16 x 4

Answer Any FOUR questions.

2. Who were the orientals and what was their attitude towards Indian Society?

3. Give an account of the life and achievements of Swamy Dayananda Saraswati.

4. Describe the role of the Company Government for the abolition of the social evils like Sati Infanticide and Human Sacrifice.

5. Discuss about the career and achievements of Jyotiba Phule as a reformer.

6. Give an account of the British Education Policy in India from the time of Bentik to Delhousie.

7. Describe the various measures adopted by the British Government for abolition of social evils like Sati, Infanticide and human sacrifice.

8. Give an account of the Non-Brahmin movement in South India.

9. Give an account of the activities of Christian Missionaries in India during British rule.

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GACR

PG, 3ᴿᴰ SEMESTER EXAMINATION-2019

Sub: POL.SCIENCE　　　　　　　　Full Marks: 80

Paper: 303　　　　　　　　　　　　Time: 4 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Question No. 1 is mandatory.

GROUP-A

1. Answer any EIGHT questions.　　　　　　　　　[2x8]

(a) What do you mean by foreign policy?

(b) Write two determinants of India's foreign policy.

(c) Define NAM.

(d) Write two objectives of SAARC.

(e) What is India's Look-East policy?

(f) Write down two major outcomes of PM Modi's recent visit to us.

(g) Highlight two important developments of the 2nd India-China informal summit, in Oct 2019

(h) Name the major issues straining India-Pakistan relationship.

(i) Name two important agreements signed between Indian PM Modi and Bangladeshi PM Sheikh Hasina's recent visit to India in Oct 2019.

(j) Explain SLINEX 2019.

(P.T.O...)

GROUP-B
[16x4]
Answer any FOUR questions.

2. 'Indian foreign policy has been characterised by a high degree of continuity and on several occasions, it has been characterised by far-reaching changes'. Comment.

3. Define NAM. Discuss the factors which have shaped the growth and development of Non-Allignment as the cornor-stone of India's foreign policy.

4. Write an essay on Indo-ASEAN Relations.

5. 'India and Russia both have multifaceted relationship involving strategic and high level cooperation.' Discuss.

6. Discuss the progress of Sino-India relations particularly after president Xi Jinping's recent visit to India.

7. 'Anti-India attitude of Pakistan continues to determine the course of Indo-Pak relations'. Comment.

8. Write a brief note on the progress of Indo-Bangladesh relations in the 21st Century.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- SOCIOLOGY   Time: 4 Hours
PAPER : 303   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

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

    a)   What do you mean by development?

    b)   What is Neo-liberalism?

    c)   What is ecology?

    d)   What do you mean by sustainability?

    e)   What is economic growth?

    f)   What is philanthropy?

    g)   What is the concept of voluntarism?

    h)   Define modernization.

    i)   What is neo-colonialism?

    j)   Define NGOs.

P.T.O.

Group - B

[16 x 4

Answer Any FOUR questions.

2. Examine the concept of development from the Marxian perspective.

3. What do you mean by Alternative Development? What are its key characteristics?

4. Define 'Modernization' and discuss the major approaches to the study of modernization.

5. Write a short essay on 'Human Development index'.

6. What is Ecology? How does it relate to Sustainable Development?

7. What is gender? Examine its relevance for the development of India?

8. Discuss the historical emergence of NGOs.

9. Define voluntarism and discuss its importance in the society today.

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GACR
PG, 3RD SEMESTER EXAMINATION-2019

Sub: PSYCHOLOGY　　　　　　　　Full Marks: 60

Paper: 303　　　　　　　　　　　Time: 4 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Question No. 1 is mandatory.

GROUP-A

1. Answer any SIX questions.　　　　　　[2x6]

　(a) Health psychology is an interdisciplinary field.

　(b) Is health psychology related to socio-cultural context.

　(c) What is biopsychosocial model of health?

　(d) Define stress.

　(e) Selye's general adaptation syndrome (GAS).

　(f) Promotion of health

　(g) Well-being

　(h) Evaluation of health promotion strategy.

GROUP-B
Answer any FOUR questions.

[12x4]

2.　Define health psychology. Discuss the main objectives of health psychology.

3.　Substantiate different dimensions of health.

4.　What is health model? Highlight bio-medical model of health.

5.　Describe the nature and sources of chronic stress.

6.　Narrate about different methods to manage stress.

(P.T.O...)

7. Elucidate various healthy health habits for socal and emotional aspects of health.

8. Illustrate about health enhancing behaviours relating to health management.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- BOTANY

PAPER : 303

Time: 4 Hours

Full Marks: 60

The figure in the right hand margin indicate marks.
Question No.1 is compulsory, answer any FOUR from the rest.
Give labelled diagram where ever necessary.

Group - A

[2 x 6

1. **Answer any SIX of the following in not more than two sentences.**

   a) Write two main features of natural system of classification?

   b) Name two herbaria of India.

   c) Differentiate parallelism and convegence.

   d) Give two palynological features used in taxonomy.

   e) Write two important features of *Ranales*.

   f) Mention botanical names of species of *Rosales*.

   g) What is heterothalism?

   h) How do plasmogamy takes place in gametangial contact?

P.T.O.

Group - B

[12x 4

Answer any FOUR questions.

2. Give an account of Engler and Prantl's system of classification. Write its merit and demerits.

3. Describe the salient features of ICBN.

4. Describe how anatomy and cytology is used in solving taxonomical problems.

5. Write notes on:

a) Embryology as taxonomic tool

b) Orchid flower structure.

6. Give an account of range of floral structure of *Lamiales.*

7. Give an account of host-parasite interactions.

8. Write notes on:

a) Diplanetism

b) Eradication in plant disease control.

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GACR

PG, 3ᴿᴰ SEMESTER EXAMINATION-2019

Sub: ODIA
Paper: 303

Full Marks: 80
Time: 4 Hours

Answer the questions as per instruction.
The figure in the right hand margin indicate marks.
Question No. 1 is mandatory.

କ-ବିଭାଗ

[2x8]

୧. ଯେକୌଣସି ୮ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ ।

(କ) କୁଞ୍ଜ ବିହାରୀ ଦାଶଙ୍କ ଗବେଷଣା ନିବନ୍ଧ ଗ୍ରନ୍ଥର ନାମ କ'ଣ ? ଏହା କେଉଁ ବିଷୟ ଆଧାରିତ ?

(ଖ) ଚିତ୍ତରଞ୍ଜନ ଦାସଙ୍କ ଅନୂଦିତ ଦୁଇଖଣ୍ଡ ବହିର ନାମ ଲେଖ ।

(ଗ) ଗବେଷଣା ଆରମ୍ଭର ପ୍ରଥମ ସୋପାନ କ'ଣ ?

(ଘ) କ୍ଷେତ୍ର ସର୍ବେକ୍ଷଣ କାଳରେ କେଉଁ ସମସ୍ୟା ଗୁଡ଼ିକ ଗବେଷକଙ୍କ ପ୍ରତିବନ୍ଧକ ହୁଏ ?

(ଙ) ଭାରତ ବର୍ଷର ପ୍ରଥମ ସମ୍ପାଦକ କିଏ, ଏବଂ ତାଙ୍କ ଗ୍ରନ୍ଥର ନାମ କ'ଣ ?

(ଚ) ଗୋଟିଏ ଭାଷାର ଏକ ନାଟକକୁ ସେହି ଭାଷାରେ ତାର ଉପନ୍ୟାସରେ ରୂପାନ୍ତରକୁ ଆମେ ଅନୁମୋଦ କହିପାରିବା କି ?

(ଛ) ନଥିପତ୍ର ଓ ପୁରୁଣା ପତ୍ରିକା ରହୁଥିବା ଅନୁଷ୍ଠାନକୁ ଇଂରାଜୀ ଓ ଓଡ଼ିଆ ଭାଷାରେ କ'ଣ କୁହାଯାଏ ।

(ଜ) କୁଞ୍ଜ ବିହାରୀ ତ୍ରିପାଠୀ କେଉଁ ବିଷୟରେ ଗବେଷଣା କରିଛନ୍ତି ?

(ଝ) ଜଣେ ଗବେଷକର ପ୍ରଥମ ପରିଚୟ କ'ଣ ?

(ଞ) ମୁଁ କିପରି ଗବେଷଣା କଲି– ବହିର ଲେଖକଙ୍କ ନାମ ଲେଖ ।

[16x4]

ଖ-ବିଭାଗ

(ଦୀର୍ଘ ଉତ୍ତର ମୂଳକ ପ୍ରଶ୍ନ– ଯେକୌଣସି ୪ଟିର ଉତ୍ତର ଲେଖ)

୨. ଖଣ୍ଡିଏ ଭଲ ଅନୁବାଦ ଗ୍ରନ୍ଥ ଆମେ କାହାକୁ କହିବା ଓ କାହିଁକି– ଉଦାହରଣ ମାଧ୍ୟମରେ ପ୍ରମାଣ କର ।

(P.T.O...)

୩. ଅନୁବାଦ କାହିଁକି କରାଯାଏ ଏବଂ ଅନୁବାଦ କଲ ଯୋଗ୍ୟତା ସଂପର୍କରେ ଲେଖ ।

୪. ପଢ଼ିଥିବା ଯେକୌଣସି ଉଚ୍ଚମାନର ଗବେଷଣା ଗ୍ରନ୍ଥ ସମ୍ପର୍କରେ ଆଲୋଚନା କର ।

୫. ଗବେଷଣାରେ କ୍ଷେତ୍ର ସର୍ବେକ୍ଷଣ ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ– ଏହି କାର୍ଯ୍ୟ କିପରି ନିର୍ବାହ କରାଯାଏ ଲେଖ ।

୬. କଳା ଓ ବିଜ୍ଞାନ – ଏହି ଦୁଇ ପ୍ରକାରର ବିଦ୍ୟାରେ ଗବେଷଣା ପଦ୍ଧତିର ଭିନ୍ନତା ରହିଛି ଚର୍ଚ୍ଚା କର ।

୭. ବିଜ୍ଞାନ–ଦୃଷ୍ଟି ସଙ୍ଗତ ଗବେଷଣା ପଦ୍ଧତି ସମ୍ପର୍କରେ ନିଜ ବିଚାର ଉପସ୍ଥାପନ କର ।

୮. ଏକ ପ୍ରାଚୀନ ଅଥବା ମଧ୍ୟକାଳର ବହି ସମ୍ପାଦନାକୁ ଗବେଷଣା କରାଯାଇପାରିବ କି ?

- x - x - x -

GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- MCS

PAPER : 303

Time: 4 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) What is Scatternet in Bluetooth?

   b) What is the different between Home agent and foreign agent?

   c) What are the challenges in implementing mobile agent system?

   d) Why do hidden terminal problem arise?

   e) What are the routing metrics in wireless adhoc Network?

   f) Difference between soft Handoff and Hard Handoff.

   g) What are the disadvantages of small cells.

   h) List the basic access mechanisms defined for IEEE 802.11.

   i) Distinguish infrastructure and adhoc networks.

   j) What is encapsulation in mobile IP?

P.T.O.

Group - B

Answer any FOUR questions.

2.   Explain GSM architecture in detail.   [16

3. a)   Describe in detail about HIPERLAN.   [8

   b)   Describe Bluetooth protocol stack with diagram.   [8

4. a)   Explain agent discovery process in mobile-IP   [8

   b)   How tunneling and encapsulation happens in mobile-IP. Describe.   [8

5. a)   Describe snooping in TCP.   [8

   b)   Discuss the protocol architecture of IEEE 802.11.   [8

6. a)   Explain mechanism for IP packet delivery using mobile IP.   [8

   b)   Explain indirect TCP with help of a neat diagram.   [8

7.   Discuss the different ways of performing encapsulation needed for tunneling in mobile IP.   [16

8.   Write notes on any FOUR.

   a)   L2CAP

   b)   Care of Address   [4x4

   c)   Foreign Agent

   d)   SIM

   e)   BRAN

   f)   Reverse Tunneling.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- ZOOLOGY   Time: 4 Hours

PAPER : 303   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   [2 x 6

1.   **Answer any SIX of the following.**

a)   What is the function of cortical granule?

b)   Define spermiogenesis.

c)   What is mitochondrial control of ageing?

d)   Define apoptosis.

e)   Enlist types of stem cells.

f)   Name four teratogens.

g)   What are the natural media used for animal cell culture?

h)   Define cryopreservation.

P.T.O.

Group - B

[12x 4

Answer any FOUR questions.

2. What is gametogenesis? Describe mammalian oogenesis.

3. Describe origin and fate of neural crest cells.

4. Give an account of different steps of invitro fertilization. Add a note on its significance.

5. Discuss spatial and temporal gene expression during embryonic development.

6. What is teratogenesis? Describe the mechanism of action of alcohol as a teratogen.

7. Give an account of various synthetic culture media used for cell culture.

8. Write notes on the following

   a) Suspension culture

[6x 2

   b) Culture of cell lines.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- ENGLISH

PAPER : P-303

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

[2 x 8

1.   **Answer any EIGHT of the following.**

a)   What are the main theories of learning?

b)   What do you understand by input hypothesis?

c)   What do you mean by aptitude?

d)   What is inter language?

e)   What is direct method of learning language?

f)   Name some innovative materials for language teaching.

g)   Explain the term Suggestology.

h)   What is C- test?

i)   Name two audio visual aids.

j)   Why is metalinguistic awareness important?

P.T.O.

Group - B

Answer any FOUR questions.

[16x 4

2. What is relationship between language, mind and society?

OR

Differentiate between English as the second language and English as a foreign language

3. What factors influence English language learning?

OR

What factors affect language learning?

4. What is grammar translation method in language teaching? How far is it successful?

OR

Discuss various methods of language teaching.

5. English as a *Lingua Fran ca*. Discuss.

OR

What are psychological tests? Discuss their importance in language learning.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- MCO   Time: 4 Hours
PAPER : 303   Full Marks: 80

The figure in the right hand margin indicate marks.
Question No.1 is compulsory, answer any FOUR from the rest.

PART - I   [2 x 8

1.   **Answer any EIGHT of the following.**

i)   Name the parties intrested in accounting information.

ii)   What is Horizontal Analysis?

iii) What is Liquidity Ratio?

iv)   What is Break-even point?

v)   What is CVP Analysis?

vi)   What is Master Budget?

vii) What is Idea standard & Normal standard?

viii) What are the budgetary control ratios?

ix)   What is cost center & profit centre?

x)   What are the kinds of variances?

PART- II

Answer any FOUR questions.

2. Who is an Accountant? Explain the position, role and responsibilities of an Accountant in 21st century organisations. [16

3. What is a Ration? Explain the different types of ratio with suitable example. [16

4. a) Explain the application of marginal costing in managerial decision making. [8

   b) 'Cost-volume profit analysis & break even point analysis are same'- Comment. [8

5. a) What is a Sales Budget? How is it prepared? [8

   b) 'Z' Ltd had a profit plan approval for selling 5,000 units per month at an average price of Rs. 10 per unit. The budgeted variable cost of production was Rs.4. per unit & the fixed costs were budgeted at Rs. 20,000, the planned income being Rs. 10,000 per month. Due to storage of raw materials, only 4,000 units could be produced and the cost of production increased by 50 paisa per unit. The selling price was raised by Rs. 1.00 per unit. In order to improve the product on process, an expenditure of Rs. 1,000 was incurred for research & development activities. [8

   You are required to prepare a performance Budget & find out the variance.

6. a) How do you ensure the success of a standard costing method in your organization. [8

   b) A manufacturing concern which has adopted standard costing furnishes you the following information. [8

   Standard

   Material for 70 Kg. finished products requires 100 kg raw mateials price of materials Rs. 1 per kg.

   Actual

Output	2,10,000 Kgs.
Material used	2,80,000 Kgs.
Cost of materials Rs.	2,52,000.00

   Calculate

   a) Material usage variance

   b) Material Price variance

   c) Material cost variance

7. What is responsibility Accounting? Explain the significance, objective & determinants of responsibility center?

8. Write short notes on: [4x 4

   a) Investment centre

   b) Activities based costing

   c) Balance score card

   d) Reporting to management.

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- Mathematics (Graph Theory)   Time: 3 Hours
PAPER : P-303   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.**   [6 x 2

a) Define order of a non-directed graph with example.

b) Define Pseudograph with example.

c) Draw a weekly connected graph.

d) Write down the condition that a graph will be Eulerian.

e) Draw a binary tree with exactly eight children.

f) How many number of vertices at maximum are possible for a binary tree of height h.

g) Prove that the graph K_5 is non-planar.

h) Define chromatic number and what is the chromatic number of a tree with at best three ages.

Answer any FOUR questions.

2. a) Prove that every cubic graph has even number of vertices. Again if G(V,E) is a graph with 12 edges and G has 6 vertices each of degree 3 and the rest have degree less than 3, then find out the minimum no. of vertices in G.   [6

b) If G is simple graph with n vertices and K components, then porve that G can have at most $(n-k)$ $(n-k+1)$ / 2 number of edges. [6

3. a) Define compliment of a graph and prove that if G is not connected then its compliment is connected. [6

b) State Konigberg's bridge problem and its solution strategy by Euler. [6

4. a) Derive all cut sets and cut vertices of the bipartite graph $K_{3,3}$ [6

b) Prove that a directed multigraph having no isolated vertices has an Euleran cut if and only if the graph is weekly connected and the in-degree and out-degree of each vertex are equal. [6

5. a) If a connected planar graph G has n vertices; e edges and r regions, then prove that $n - e + r = 2$. [6

b) Define pre-order, post-order and in-order traversal of a binary tree. [6

6. a) State and prove five-color theorem. [6

b) Describe Wetch -Powell algorithm for vertex coloring a graph. [6

7. a) How many extension cord are needed to connect 19 lamps to a single electric out let of each extension cord has 4 output. Also draw the diagram. [6

b) Apply Dijkstra's algorithm to find the shortest path from vertex a to z. [6
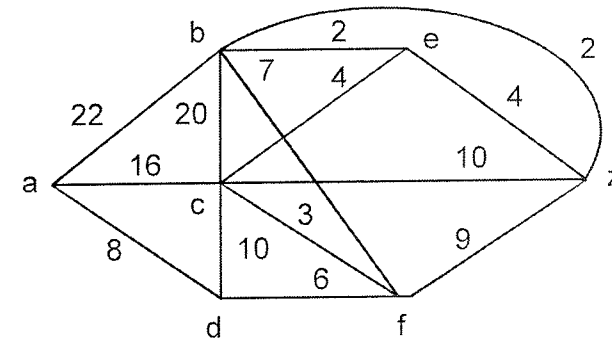
8. a) Draw the graph that represent the matrix [6

$$A = \begin{pmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

Also find the graph for A^2.

b) Distinguish between covering and partitioning of directed graphs. [6

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GACR

PG 3rd SEMESTER EXAMINATION-2019

Sub.- PHYSICS   Time: 4 Hours

PAPER : 303   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   [2 x 6

1.   **Answer any SIX questions of the following**

a)   State Ampere's circuital law and discuss why and how it was modified to include displacement current.

b)   Gauge transformation are meant for ...... The choice of Lorentz /Coulomb Gauge depends on ....

c)   Justify the statement that 'In electromagnetic waves, electric vectors is more important than magnetic vector.

d)   Making use of the Maxewell's equations, derive the equation for plane electro-magnetic waves in free space.

e)   What is normal & Anomalous dispersion.

f)   Write Kramer-Kroning dispersion relation and define the terms used.

g)   What are retarted potentials. Give an example of it.

h)   Why is the sky blue during the day and sun is red during sunset and sunrise.

P.T.O.

Group -B

Answer Any FOUR questions.

2. a) Establish the law of conservation of energy for the electromagnetic field. Explaining the meaning of various terms involved in it. Obtain the dimensions of Poynting's vector. [6

   b) Laser are light source which gives almost perfectly parallel beam of high intensity. If a 2K half laser beam is concentrated by a lens into cross-sectional area about 10^{-6} square cm, what is the value of poynting vector and the amplitude of the electric field. [6

3. a) Dereive an expression for Maxwell's stress tensor. [6

   b) How are the scalar and vector potentials related to the electric and magnetic fields? Explain Lorentz conditional and discuss the significance. [6

4. a) Discuss the propogation of plane monochromatic electromagnetic waves in conducting media. Derive the dispersion equation & thus obtain

   (i) Phase velocity *(ii)* refractive index

   (iii) Skin depth [3

   b) *(i)* What are linear circular & elliptic polorized electromagnetic waves. [3

   (ii) Write Maxwell's equation in free space, dielectric medium and in conductors.

5. a) What is normal & anomalous dispresion? Derive Sellmeir's equation for refractive index of a dielectric medium. [6

   b) Obtain Kramer-Kroning dispresion relation & discuss its significance. [6

6. Show that the scattering cross-section when plane menochromatic em waves are incident on a bound electron is inversely propotional to the fourth power of the wavelength of incident radiations if the wavelengths of the incident radiations are much greater than that corresponding to the natural frequency of the bound electrons. [12

7. a) Obtain the expression for Rayleigh scattering with example. [6

   b) Obtain the expression for Thomson scattering with example. [6

8. a) Obtain the electric and magnetic field from an oscillating electric dipole & calculate the time averaged power radiated per unit solid angle & the total power radiated by it. [6

   b) (i) We say for ideal plasma $\lambda_0 \ll$ plasma length. Why we are imposing this restriction? What is TOKAMAK & how it is related to plasma & what is its application. [3

   ii) What are three main approximations used for electric dipole radiation & magnetic dipole radiation. [3

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PG-Third Semester End-Term Examination, 2019

STATISTICS

Paper: P-303: Applied Stochastic Processes

Full Marks: 60   **Time: 3 Hours**

1. Answer **ANY SIX** of the following questions: $[2 \times 6 = 12]$

   (a) Define a martingale process.

   (b) What is the expected duration of the game in a classical Gambler's ruin problem?

   (c) What is the probability of ever returning to a transient state in an irreducible Markov Chain?

   (d) Consider a sequence of tosses of a coin with the probability of "heads". At time n (after n tosses of the coin) the state of the process is the number of heads in the n tosses minus the number of tails. Find the transition probability matrix.

   (e) Define a non-homogeneous Markov Chain.

   (f) Define a Yule-Furry process.

   (g) Write the Chapman-Kolmogorov foreward and backward equations for a pure-birth process.

   (h) Define a Wiener process.

2. Define a symmetric random walk in one and two dimensions. Show that in a symmetric random walk in one or two dimensions, the initial state is a persistent state, where as it is not so in a three dimensional symmetric random walk. [12]

OR

Define Gambler's ruin problem. Find the generating function of the duration of the game and also the generating function of first passage times. [12]

3. Given a finite aperiodic irreducible Markov chain, prove that for some n all terms of P^n are positive.

Again, for any Markov Chain, if the state j is a transient state prove that for all i, $\sum_{n=1}^{\infty} P_{ij}^n < \infty$. [6 + 6]

OR

The transition probability matrix P of a Markov Chain is given by

$$P = \begin{pmatrix} 1-a & a \\ b & 1-b \end{pmatrix}, \quad S = \{0, 1\}, \quad 0 < a, b < 1.$$ Find the n-step transition probabilities. Show that, it is stationary. If the initial distribution is given by $Pr\{X_0=0\} = p$ and $Pr\{X_0=1\} = q$, such that, $p+q=1$, $0 < p < 1$, find $Pr\{X_n=1\}$. [12]

4. Define a non-homogeneous process. Show that the probability generating function of a non-homogeneous Poisson process $\{N(t): t \geq 0\}$

is given by

$$Q(S, t) = exp\{m(t)(S-1)\}$$

where $m(t) = \int_0^t \lambda(u)du = E\{N(t)\}$. [12]

OR

Define a Birth-Death Process. Derive the n-step transition probability matrix of this process using Chapman-Kolmogorov's equations. [12]

5. Define a Wiener process. Discuss the properties of this process. Show that a Wiener process is a martingale process. [12]

OR

Obtain the differential equation of a Weiner process. Find the first passage time distribution for this process. [12]

17

Subject:CHEMISTRY   PAPER:CH-303   Full Mark:60   Time:3 hour

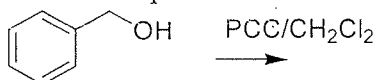*Answer all questions as per instruction*

SECTION -A
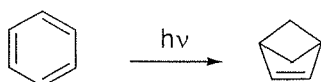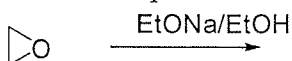### Answer any SIX questions   (2x6)

1 (a) Predict the product of the following reaction.

   OH PCC/CH_2Cl_2

(b) Write down the product of Wolff-Kishner reduction of Octane-2-one

(c) Give one example of Norish type-I photochemical reaction .

(d) Write the mechanism of following reaction.

   hv

(e) Predict the product of the following reaction.


   $EtONa/EtOH$

(f) Write down the structure of Vitamin -C

(g) What is Gilmmans reagents? Write down one use of this catalyst in organic synthesis ?

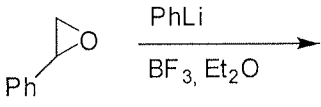(h) Predict the product of the following reaction.

   CH_3Li
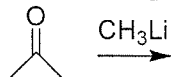
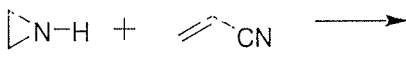### SECTION -B
Answer any FOUR questions

2. (a) What is Wilkinson's catalyst? Explain with mechanism how this is used   (06)
          for hydrogenation of olefin

(b) What is swearn oxidation? Explain with suitable example.   (06)

3. (a) Write short notes on Norish type-II photochemical reaction   (06)

(b) What is paterno buchi reaction? write down the product of the following   (06)
      reaction

   hv
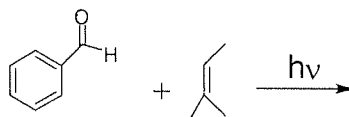
4. (a) How Indole can be prepared by Fisher Indole synthesis ?   (06)

(b) How Quinoline can be prepared by Skraup'smethod ?   (06)

5. (a) How is pyridine synthesized? What happens when   (06)

5. (a) How is pyridine synthesized? What happens when (06)
(i) Pyridine react with $NaNH_2$/Liq NH_3
(ii) Pyridine react with Butyl Lithium

    (b) Predict the product of the following reactions and suggest the possible (06)
mechanism

    (i)

    (ii)

6. (a) Discuss the photochemical reaction of Cyclohexadienone with suitable (06)
example.
    (b) What are glycosides? Describe a glucoside linkage. (06)
7. (a) Write short notes on Clemmensen reduction (06)
    (b) Write short notes on Chiral auxiliaries. (06)
8. (a) Write down the importance of organozinc compund in oraganic synthesis (06)
    (b) Write down the preaparation and two applications of organomagnesium (06)
compund.