GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.- EDUCATION   Time: 4 Hours

PAPER : 101   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

[6 x 2

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

   i)   Concept of education according to Aristotle.

   ii) Integral education according to Sri Aurobindo.

   iii) Concept of Perennialism.

   iv) Aims of education according to Existentialism.

   v)   Aims of education according to Sankhy Philosophy.

   vi) Features of Vedanta philosophy.

   vii) Concept of curriculum.

   viii) Pupil as component of education.

Group - B

[12x 4

Answer Any FOUR questions.

2. Give a critical estimation of the educational thoughts of J.J. Rousean towards the theory and practice of education.

3. Critically examine the contribution of M.K. Gandhi towards the educational theory and practice.

4. What is existentialism? Discuss its impact on different aspects of education.

5. Describe the basic features of Marxism. State its educational implications.

6. Explain the salient features of Islamic education with reference to knowledge, value and realities of life.

7. How far did the Vedanta philosophy influenced the educational system? Explain with examples.

8. "It is the function of the educational institution is to coordinate its activities and programmes with other components of education, Explain.

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PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- ENGLISH Time: 3 Hours
PAPER : P-101 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 [8 x 2

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

a) What is language?

b) Why is linguistic called science?

c) What is a syntax?

d) Define Intonation.

e) What is the difference between phonemic transcription and phonetic transcription?

f) Phonetically transcribe 'Garden'.

g) What do you mean by standard language?

h) What are allophones in English?

i) Morphologically analyse 'Disadvantage'.

j) Explain the role of tongue in the production of speech.

P.T.O.

Group - B

[16x 4

2. What are the characteristics of human language? How human language differs from animal language?

OR

Discuss various branches of linguistics in detail.

3. What are the different types of syllabus in English? Explain giving examples.

OR

What is the difference between phonology and phonetics. Discuss.

4. Discuss Morphology. What are the different kinds of morphemes?

OR

What is meant by structuralism in the field of linguistics?

5. What is meant by language variation? Explain.

OR

Discuss in detail parallelism and Deviant structures with examples.

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: PSYCHOLOGY   Full Marks: 60

Paper: 101   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   [2x6]

1. Answer any SIX questions given below.

(a) Define Warning

(b) Backward conditioning

(c) Intermittent reinforcement

(d) Retrieval mechanism

(e) Retroactive inhibition

(f) Sub-conscious

(g) Self-actualisation

(h) General factor in intelligence   [12x4]

GROUP-B

Answer any FOUR questions.

2. Discuss Skinner's operant conditioning

3. Explain different processes of memory.

4. Describe the theories of forgetting

5. Substantiate psycho-analytic theories of personality.

6. What is projective test? Enumerate few projective tests used for assessment of personality.

7. What is intelligence? Point out the salient features of artificial intelligence.

8. Compare the role of heredity and environment in the development of intelligence

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: POL. SCIENCE   Full Marks: 80

Paper: 101   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 given below.   [2x8]

(a) What do you mean by political theory?

(b) Define the nature of traditional political theory.

(c) Mention the scope of modern political theory.

(d) What is Behaviouralism?

(e) Write two important features of post behaviouralism.

(f) Mention two important decision making mechanisms for analysis of political system.

(g) Explain two important roles of elites in the societal decision making process.

(h) Name the champion of group theory of politics.

(i) What is political system with reference to the view of David Easton?

(j) Write down two 'out put' functions in a political system.

(k) Mention two important features of Almond's structural-functional analysis.

(l) What is political culture?

GROUP-B
Answer all questions.

[16x4]

2. Discuss the nature and scope of traditional approach to the study of political theory. What are its prime concerns?

OR

Make a critical analysis of modern behavioural approach to the study of modern political theory.

3. Elaborate the classification of sociental values. Evaluate the role of Elites in the societal decision-making process.

OR

Discuss the basic postulates of Group Theory in politics. Estimate its role and effectiveness in the political process.

4. 'The model of political system has served as a basis for Almond's model of structural - functional analysis as also for Karl Deutsch's model of communication theory. Comment.

5. Critically examine the political cybernetic theory of Karl W. Deutsch.

OR

What do you mean by political culture? Discuss the importance of political culture as the main determinant of political development.

GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.-Computer Organisation Architecture

Time: 4 Hours

PAPER : MCS-101   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

[8 x 2

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

   a)   What is an interrupt?

   b)   Define memory access time.

   c)   What is indexed addressing mode?

   d)   What is the function of ALU?

   e)   Define clockrate.

   f)   What is pipeline hazard?

   g)   Define seek time and latency time.

   h)   What is Instruction Boss.

   i)   Add +25 and –36 using z's compliment.

   j)   Why ROM is necessary for any computer?

[2]

Group - B

[16x 4

Answer Any FOUR questions.

2. a) What are stack and quess. Explain its use and give its difference.

   b) Explain the basic I/o operation of Modern processor.

3. a) Explain about instruction execution characteristicks.

   b) Find out the solutions of Introduction hazards.

4. a) Discuss the various mapping techniques used in cache momory.

   b) Explain about secondary storage device.

5. a) Explain in detail about interrupt handling.

   b) Describe the functions of SCSI with a diagram.

6. a) Differentiate RISC & CISC

   b) Differentiate Virtual memory an Cache memory

7. a) Explain Memory Location & Address

   b) Discuss about different types of addressing modes.

8. Write short notes on (Any FOUR)

   a) Real Access Time   [4x 4

   b) Dead Lock

   c) Symbolic micro Instructions.

   d) Memory Mapping

   e) DMA.

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GACR

PG 1st SEMESTER EXAMINATION-2019

Sub.- SOCIOLOGY Time: 4 Hours

PAPER : 101 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 x8

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

   i) Briefly explain Comte's idea of social statics and dynamics.

   ii) Explain the idea of social evolution proposed by Herbert Spencer.

   iii) What do you mean by totemism?

   iv) Mention two major contributions of Saint Simon.

   v) Define Durkheim's understanding of anomic suicide.

   vi) Write down the rules of sociological method proposed by Emile Durkheim.

   vii) Explain briefly dialectical materialism viewed by Karl Marx.

   viii) Differentiate between the Marxian concept of class in itself and class for itself.

P.T.O.

ix) Highlight the major conditions of social action suggested by Max Weber.

x) Define Weberian understanding of class.

xi) Explain the view of Weber on power.

Group - B

[16 x 4

Answer Any FOUR questions.

2. Discuss the industrial revolution and its impact on sociology as a discipline.

3. Define Comtian idea of Positivism and discuss the major criticisms of positivism.

4. Analyse Dukheim's understanding of Division of Labour with a focus on Mechanical and Organic Solidarity.

5. Class struggle is the ultimate solution to the misersies of the proletariats- justify from a Marxian perspective.

6. Briefly discuss Max Weber's views on the Protestant Ethics and emergence of capitalism.

7. Discuss ideal type as a subjective approach propagated by Weber.

8. Elaborate Marx's views on theory of alienation.

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PG 1st SEMESTER EXAMINATION-2019

Sub.- HINDI   Time: 4 Hours

PAPER : 101   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. निम्नलिखित किन्हीं **आठ** प्रश्नों के संक्षिप्त उत्तर दीजिए।

क) जॉर्ज ग्रियर्सन रचित हिन्दी साहित्येतिहास पुस्तक की विशेषताएँ क्या हैं ?

ख) साहित्य के इतिहास के प्रति आचार्य रामचन्द्र शुक्ल के क्या दृष्टिकोण रहा हैं ?

ग) हिन्दी के इतिहास से सम्बन्धित आचार्य हजारी प्रसाद द्विवेदी की पुस्तकों का नाम लिखिए।

घ) हिन्दी साहित्य के आदिकाल को किन-किन नामों से सम्बोधित किया गया है ?

ङ) आदिकाल मे धार्मिक साहित्य के अंतर्गत किन किन प्रमुख सम्प्रदायों की चर्चा की जाती हैं ?

च) विद्यापति की प्रमुख रचनाओं का नाम लिखिए।

छ) किन्ही दो वीरगाथात्मक रासो काव्य का नाम लिखिए।

ज) निर्गुण ज्ञानाश्रयी काव्यधारा पर किन किन विचारों का प्रभाव है ?

झ) सुफी मत में साधक की चार अवस्थाएँ कौन कौन सी हैं ?

ज) 'पुष्टिमार्ग' किस भक्तिधारा सम्बन्ध रखता है ? उसके प्रवर्त्तक कैान हैं ?

GROUP - B [16x4]

(निम्नलिखित किन्हीं चार प्रश्नों के उत्तर दीजिए)

2. हिन्दी साहित्य के इतिहास लेखन की परम्परा पर प्रकाश डालिए।

अथवा

हिन्दी साहित्य के इतिहास के कालविभाजन एवं नामकरण के स्वरूप का विवेचन कीजिए।

3. आदिमकाल काव्य का परिचय देते हुए उसकी प्रमुख विशषताओं की चर्चा कीजिए।

अथवा

पृथ्वीराज रासों की प्रामाणिकता पर तर्क प्रस्तुत कीजिए।

4. ज्ञानाश्रयी संत काव्य धारा की प्रवृत्तियों की चर्चा कीजिए।

अथवा

हिन्दी रामकाव्य परम्परा का परिचय देते हुए रामभक्ति काव्य की विशेषताएँ बताइए।

5. किन्ही दो पर टिप्पणियाँ लिखिए

क) साहित्येतिहास लेखन की पद्धतियाँ

ख) आदिकाल और नामकरण की समस्याएँ

ग) सिधु साहित्य

घ) कृष्ण-भक्ति काव्य

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GACR

PG, 1ST SEMESTER EXAMINATION-2019

Sub: ODIA Full Marks: 80

Paper: 101 Time: 4 Hours

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

୧. ତଳେ ଦିଆଯାଇଥିବା ପ୍ରଶ୍ନ ମାନଙ୍କ ମଧ୍ୟରୁ ଯେକୌଣସି ୮ ଗୋଟି ପ୍ରଶ୍ନର [2x8]
ଉତ୍ତର ଦିଅ ।

(କ) 'ଶିଶୁବେଦ' କେଉଁ ଧର୍ମର ସାଧନ ଗ୍ରନ୍ଥ ?

(ଖ) ଚର୍ଯ୍ୟା ଗୀତିକା ଗୁଡ଼ିକୁ ପ୍ରଥମେ କିଏ କେଉଁଠାରୁ ଆବିଷ୍କାର କରିଥିଲେ ?

(ଗ) କେଉଁ ଶିଳାଲେଖକୁ ପ୍ରଥମ ଓଡ଼ିଆ ଶିଳାଲେଖ କୁହାଯାଏ ।

(ଘ) 'କେଶବ କୋଇଲି' କବିତାର ରଚୟିତା କିଏ ?

(ଙ) ସାରଳା ମହାଭାରତର ପ୍ରଥମ ବିସ୍ତୃତ ଆଲୋଚନା ଗ୍ରନ୍ଥର ନାମ କଣ ?
ଏହାର ରଚୟିତା କିଏ ?

(ଚ) ମହିଷାସୁରର ପିତା/ମାତାଙ୍କ ନାମ କଣ ?

(ଛ) 'ପ୍ରଥମେ ରାମାୟଣ ଦ୍ୱିତୀୟେ ମହାଭାରତ ତୃତୀୟେ ରଚନା କଲି ମୁଁ ଶିରୀ
ଭାଗବତ' ଏଠାରେ 'ଶିରୀ ଭାଗବତ' କହିଲେ କବି କେଉଁ ଗ୍ରନ୍ଥ କଥା
କହୁଛନ୍ତି । ଏହା କେଉ କବିଙ୍କ ବକ୍ତବ୍ୟ ?

(ଜ) 'ଚାରିଖାନି' ର ରଚୟିତା କିଏ ? ଏହି ଗ୍ରନ୍ଥର ଅନ୍ୟନାମ କଣ ?

(ଝ) ଜଗନ୍ନାଥ ଦାସଙ୍କ ଭାଗବତ କେଉଁ ଟୀକା ଆଧାରରେ ରଚିତ ?

(ଞ) ଦାଣ୍ଡି ରାମାୟଣର ବକ୍ତା ଓ ଶ୍ରୋତା କିଏ ?

(ଟ) ଓଡ଼ିଆରେ ପଞ୍ଚପୁରାଣ କାହାକୁ କହନ୍ତି ?

(ଦୀର୍ଘ ଉତ୍ତର ମୂଳକ ପ୍ରଶ୍ନ) [16x4]

୨. ଚର୍ଯ୍ୟାପଦମାନଙ୍କର ସାହିତ୍ୟିକ ମୂଲ୍ୟ ବିଚାର କର ।

ଅଥବା

(P.T.O...)

ଓଡ଼ିଆ ନାଥ ସାହିତ୍ୟରେ ମାନବର ଉଦ୍ଧାରଣ ପାଇଁ ଯେଉଁ ପ୍ରଚେଷ୍ଟା କରାଯାଇଛି ସଦୃଷ୍ଟାନ୍ତ ଆଲୋଚନା କର ।

୩.   'ଯାହା ନାହିଁ ଭାରତେ ତାହା ନାହିଁ ଭାରତେ'– ଉକ୍ତିର ଯଥାର୍ଥ ସାରଳାଙ୍କ ମହାଭାରତ ଆଧାରରେ ବିଚାର କର ।

ଅଥବା

ଚମକ୍ରାର କଥକତା କିପରି ସାରଳା ଦାସଙ୍କୁ ଓଡ଼ିଆ ଜାତିର ମହାକବିରେ ପରିଣତ କରିଛି ଉଦାହରଣ ସହ ବୁଝାଇ ଦିଅ ।

୪.   ଲୋକଭାଷାକୁ କାବ୍ୟ ଭାଷାରେ ରୂପାନ୍ତରିତ କରି ମହାକବି ବଳରାମ ଦାସ କିପରି ରାମାୟଣ ରଚନାରେ ଆପଣାର ସିଦ୍ଧି ପ୍ରଦର୍ଶନ କରିଛନ୍ତି, ଆଲୋଚନା କର ।

ଅଥବା

ପଞ୍ଚସଖା ସାହିତ୍ୟରେ ପ୍ରତିଫଳିତ 'ପିଣ୍ଡ ବ୍ରହ୍ମାଣ୍ଡ ବାଦ' ଉପରେ ଆଲୋକ ପାତ କର ।

୫.   ସଂପୂର୍ଣ୍ଣ ସତ୍ୟଘଟଣା ଉପରେ ଆଧାରିତ ହୋଇ ନଥିଲେ ହେଁ ଓଡ଼ିଶାର ଇତିହାସ ରଚନା ଲାଗି ମାଦଳା ପାଞ୍ଜିର ଭୂମିକା ଗୌଣ ନୁହେଁ; ବିଚାର କର ।

ଅଥବା

ସରଳ ସହଜ ନୈକଟ୍ୟ ଭାବହିଁ ଓଡ଼ିଆ ବ୍ରତକଥା ଗୁଡ଼ିକର ଆଧାର ଶିଳା; ପଠିତ ସୋମନାଥ ବ୍ରତ କଥା ଅବଲମ୍ୟରେ ଆଲୋଚନା କର ।

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GACR

PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.-HISTORY   Time: 4 Hours
PAPER : P-101   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)   Who wrote Rajatarangini? What it deals with?

b)   What do you mean by the word Veda? Write the names of all the four Vedas.

c)   Who was Charles Darwin? Why he is famous for?

d)   What do you mean by the word Pharoh? Who was the last pharoh of Egypt?

e)   Which people used cuneiform writing and who deciphered it?

f)   Which foreign traveller visited India during Mauryan period? Write the name of his travel accounts.

g)   Write the names of two historians of Ancient Greece.

h)   Which ancient city was known as the city of seven hills and who were the founders of this city?

i)   Who built the great wall of China and why?

j)   Write the name of two Marxist historians of India.

k)   What do you mean by the Ziggurats? In which ancient civilization Ziggurats were built?

P.T.O.

Group - B

[16x 4

Answer Any FOUR questions.

2. Give an account of the literary sources of the Ancient Indian history.

3. Describe the life and culture of the people during hunting gathering stage.

4. Discuss about Religious life, Art and Architecture of Ancient Egypt.

5. Give an account of the development of Democratic set ups in Ancient Rome.

6. Why the age of Pericles is know as the golden age in the history of ancient Greece.

7. Describe the changes brought in the life of the Aryans during later vedic period.

8. Give an account of the polity and state craft during Mauryan period.

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GACR
PG, 1ST SEMESTER EXAMINATION-2019

Sub: CHEMISTRY   Full Marks: 60

Paper: 101   Time: 4 Hours

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

1. Answer any SIX questions given below.   [2x6]

(a) Write the point group of (i) SF_4 and (ii) BCl_3

(b) Which point group is obtained by adding a C_3V to *i* point group.

(c) What is a character Table?

(d) Write the products and balanced equation for

(i) $XeF_6 + SiO_2 \rightarrow$

(ii) $XeOF_4 + SiF_4 \rightarrow$

(e) What are Pseudo halogem compounds?

(f) What are the silicates? Explain.

(g) What are the allotropes? Write and explain about the two allotropes of sulfur.

(h) What are phophazenes?/ Write two examples of phosphazenes.

Answer any FOUR questions.

2. (a) Discuss and differentiate between symmetry elements and symmetry operations with suitable examples.   [5]

(b) Prove that

(i) $C_3^4 = C_3$ (ii) $S_5^5 = \sigma$ [2+2]

(c) Write a short note on character table.   [3]

(P.T.O...)

3. (a) Explain great Orthogonality Theorem. [6]

   (b) Consruct the character table for C_3V. [3]

   (c) Find how the functions x, y, z transform in the point [3]
   group C_2V.

4. (a) What are silicones? How will you prepare them? Write [6]
   the different types of silicones.

   (b) What are phosphazenes? How will you prepare them? [6]
   Discuss the structure of $(PNCl_2)_3$.

5. Write notes on: [4x3]

   (a) Boron nitride
   (b) Borazines
   (c) Carboranes

6. (a) What are Walsh diagrams? Explain with the help of [8]
   Walsh diagrams the geometry of

   (i) BCl_3 and NH_3 (ii) $BeCl_2$ and $SnCl_2$

   (b) Write a short note on Bent's Rule [4]

7. (a) How are XeF_4 and XeO_3 prepared. Describe their [6]
   hybridisation and molecullar shape.

   (b) What happens when (write equation) [3x2]

   (i) Potassium chlorate is heated with iodine
   (ii) Bromine trifluoride reacts with silica
   (iii) Ammonia reacts with dilute chlorine trifluoride.

8. Discuss the formation and properties of: [4x3]

   (a) Diboranes
   (b) XeF_6
   (c) Oxides of halogens

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PG 1st SEMESTER EXAMINATION-2019

Sub.-ZOOLOGY Time: 4 Hours

PAPER : P-101 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

[6 x 2

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

   a) Write the names of four bacteria involved in the spoilage of food.

   b) What is a chemostat?

   c) Spirochetes differ from other bacteria phyla. How.

   d) What are the different nutritional types of archaea.

   e) How does the cell-to-cell transmission of viruses occur in plants?

   f) What is a prion?

   g) Differentiate between exotoxines and endotoxins.

   h) Name any four groups of mycotoxins.

Group - B

[16x 4

Answer Any FOUR questions.

2. Give an account of the three domain classification system introduced by Carl Woese.

3. How can you culture and maintain micro organisms?

4. Briefly describe the means of Gnetic recombination in bacteria.

5. Describe the structure, development and functions of heterocysts.

6. Give an account of the structure, transmission replication and pathogenicity of HIV.

7. Define antibiotics. Comment on their mode of action.

8. Write short notes on.

   a) Pathogentcity of TMV.

   b) Algal toxins.

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PG, 1ˢᵀ SEMESTER EXAMINATION-2019

Sub: MATHEMATICS   Full Marks: 60

Paper: 101   Time: 4 Hours

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

1. Answer any SIX questions given below.   [2x6]

  (a) Give an example of finitely generaated abelian group.

  (b) Define conjugate of element of a group.

  (c) Under what condition an integral domain is said.

  (d) Define Eucledian Ring with example.

  (e) Prove that subgroup of a solvable group is solvable.

  (f) Define degree of extension of field.

  (g) Give one example of algebraic extension of a field.

  (h) Define fixed field with respect to Galois theory.

Answer any FOUR questions.

2. (a) Prove that conjugacy is an equivalence relaltion on G.   [6]

  (b) State and prove diamond isomorphism theorem.   [6]

3. (a) If p is a prime number and $p \mid O(G)$, then prove that the group G has an element of order p.   [6]

  (b) Prove that a subgroup of a solvable group and homomorphic image of a solvable grooup are solvable.   [6]

4. (a) Prove that a solvable grooup always has an abelian normal subgroup $N \neq (e)$.   [6]

  (b) State and prove Jordan-Holder theorem for infinite group.   [6]

(P.T.O...)

5. (a) If L is a finite extension of K and if K is finite extension   [6]
   of F, then prove that L is a finite extension of F.

   (b) Prove that sum and product of two algebraic integers   [6]
   are algebraic integer.

6. (a) Prove that a polynomial of degree n over a field can   [6]
   have at most n roots in any extensioin field.

   (b) Using Eisenstein criterion, prove that $x^4 + x^3 + x^2 + x + 1$ [6]
   is irreducible over the field of rational numbers.

7. (a) If the field F contains primitive n th root of unity, prove   [6]
   that the Galois group of $x^n - a$, for $a \in F$ is abelian.

   (b) Prove that the infinitely family of group S_n is not   [6]
   solvable for $n \geq 5$.

8. Write short notes on (any two)   [6+6]

   (a) Conjugate class

   (b) Euclidean ring modules

   (c) Normal extension of multiple root

   (d) Polynomials solvable by radicals.

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PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- Macro Economics   Time: 4 Hours
PAPER : 101   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   [8 x 2

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

a) Distinguish between the movement along a demand curve and shift in the demand curve.

b) What is slutsky substitution effect?

c) Write any two assumptions of revealed preference theory of demand.

d) What is consumers surplus.

e) What is inter temporal consumption

f) Write any one properties of CES production function.

g) What is elasticity of substitution?

h) Relate the principal agent problem with Williamson's theory of maximisation of managerial utility function.

i) What is implicit cost?

j) Why does AVC curves becomes closer to AC curve with increase in level of production.

Group - B

[16 x 4

Answer Any FOUR questions.

2. What is meant by revealed preference hypothesis? Explain Samuelson's revealed preference theory of demand based on it.

3. Examine the behaviour of a consumer under inter-temporal choice theory.

4. What is Cobb-Douglas production function? What are its useful properties? Why it is extensively used in empirical studies for estimation of production?

5. How are cost relationships related to the principle of diminishing returns? Elucidate with special reference to the shapes of cost curves.

6. On a critical note which one among the theories on objectives of a firm do you think is the most relevant in present business scenario in India?

7. Show graphically the substitution and the real income effect by Hicks and Slutsky. What is the advantage of Slutsky measure?

8. What is compensated demand function? What are its mathematical properties? Explain its relationship with other functions.

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PG 1st SEMESTER EXAMINATION-2019

Sub.- BOTANY   Time: 4 Hours

PAPER : 101   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

[6 x 2

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

   a) What is the principle of microbial culture in a chemostat?

   b) What are prions? Give an example.

   c) Define transduction.

   d) What are cyanatoxins? Give two examples.

   e) Name two microbes used for antibiotic production in industry.

   f) Name the genetic material of TMV and bacteriophage respectively.

   g) Which period is known as the 'Golden era of Microbiology' & why?

P.T.O.

Group - B

[16x 4

Answer Any FOUR questions.

2. Describe the techniques used for isolation of pure culture and maintenance of microbes.

3. What do you mean by microbial growth? Give a mathematical expression of microbial growth under batch culture & mention the factors influencing growth of microbes.

4. Give an account on the cell structure and reproduction of cyanobacteria.

5. Briefly explain the structure, transmission and replication of TMV.

6. Discuss the mode of action of fungal toxins with suitable examples.

7. Write short notes on:

   a) Mycoplasma

   b) 3 domain classification

8. Write notes on:

   a) Classification of viruses

   b) Aminoglycosides.

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PG 1ˢᵗ SEMESTER EXAMINATION-2019

Sub.- Managerial Economics   Time: 4 Hours

PAPER : Commerce-101   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) Write any two objectives of managerial Economics.

   b) Why Scarcity does exists?

   c) What are the four sectors reflected in a circular flow diagram of economic activities in a four sector economy.

   d) Discuss the two constraints laid out by Marri's hypothesis of maximisation of growth rate as an objectives of firm.

   e) What is bounded rationality as explained in satisficing model by Herbert Simon.

   f) What is economic profit?

   g) What is explicit cost?

   h) Why might a forecast obtained by projecting a past trend into the future give poor results even if the past patterns have remain unchanged.

   i) Is it always useful for a seller to lower the price in order to increase sales revenue?

   j) If average product of labour is positive but declining, then what would be the marginal product of labour.

P.T.O.

Answer Any FOUR questions.   [16 x 4

2.   Managerial economics uses the theories of economics and the methodologies of the decision sciences for managerial decision making. Elaborate

3.   On a critical note which one among the theories on objectives of firm do you think is the most relevant in present business scenario in India.

4.   What do you understand by circular flow of income? Explain with the help of two sector and four sector economy.

5.   Agricultural commodities are known to have a price in elastic demand and are considered to be necessities. Use this information to explain why the income of farmers fall.

   a)   after a good harvest , and

   b)   in relation to incomes from other sectors of the economy.

6.   What does the shape of an isoquant show? Explain its importance in managerial economics.

7. a) Distinguish between point price elasticity of demand and Arc price elasticity of demand.

    b) Distinguish between compliments and substitutes or the basis of elasticities of demand.

8.   Explain the law of variable proportion. Discuss the relationship between the marginal product and the average product curves of a variable input.

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PG 1st SEMESTER EXAMINATION-2019

Sub.- PHYSICS   Time: 4 Hours

PAPER : 101   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.**

i)   What are generatalised co-ordinates?

ii)   State and explain Hamilton's principle.

iii) Prove that the generalised momentum conjugate to a cyclic co-ordinate is conserved.

iv)   Apply Lagranges's equation of motion to one dimensional harmonic oscillator.

v)   Define Lagrange and Poisson bracket.

vi)   Define canonical transformation and explain the role of generating function.

vii) What is Corioli's force?

viii) State the condition for stable and unstable equilibrium.

Group - B

[12x 4

Answer Any FOUR questions.

2. i) Show that the work done by the external force [5

$\vec{F}$ acting upon a particle in going from point one to point two is the change in kinetic energy.

ii) Prove the law of conservation of angular memontum for the system of particles. [7

3. Distinguish between Lagrangian formulation and [4+8 Hamilton's formulation and derive Hamilton's equation of motion from the variational principle.

4. Define canonical transformation show that

$Q = \dfrac{1}{p}$ and $P = qp^2$ is a canonical transformation

where the symbols have usual meanings.

5. Obtain Hamilton Jacobi equation for Hamiltons principle function. What is action angle varibale. [8+4

6. a) Discuss small oscillations with generalised co-ordinates for n coupled oscillations. [8

    b) A particle of mass 'm' moves along the x axis under the influence of potential energy. [4

$V(x) = -Kx\ e^{-\beta x}$

where K and b are constant . Find the equilibrium position

7. Define rigid body. Show that a rigid body needs six independent generalised co-ordinates to specify its position. [4+8

8. Derive Euler's equation of motion for a rigid body and apply them to the case of a force free motion of a symmetric rigid body. [8+4

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P.G 1ST SEMESTER EXAMINATION-2019

Time – 4 Hours   Full Marks—60

The figures in the right hand margin indicate marks

Group A

1. Answer any six questions: $2 \times 6 = 12$
    i)   What is Heine Borel property?
    ii)   How can you obtain maxima of a function?
    iii)   What is the nature of improper integral $\int_0^\infty \frac{sinx}{x} dx$?
    iv)   Define length of open sets and closed sets.
    v)   Define Lebesgue upper and lower integral of the function g on $[x, y]$.
    vi)   Define a Ball on metric space.
    vii)   Show that the form : $x_1{}^2 + 2 x_2{}^2 + 3x_3{}^2 + 2x_2x_3 - 2x_1x_3 + 2x_2x_1$ is indefinite .
    viii)   Define the term 'index'.

Group B

Answer any four questions: $12 \times 4 = 48$

2. a) State and prove Weirstrass M test for uniform convergence.
   b) Let $\sum_{k=1}^\infty u_k$ be a series of real valued functions on a set E. If there exists positive numbers $M_1, M_2 \ldots$ with $\sum_{k=1}^\infty M_k < \infty$ such that $\sum_{k=1}^\infty u_k (x) \le \sum_{k=1}^\infty M_k (x \in E)$, then $\sum_{k=1}^\infty u_k$ converges uniformly on E.

3. a) Find the maxima and minima of the function $f(x,y) = x^2 + y^2 - 3x - 12y + 20$.
   b) Test whether the improper integrals converge or not: $i) \int_1^\infty \frac{dx}{x\sqrt{x^2+1}}$ $ii) \int_0^\infty e^{-x^2} dx$.

4. a) The function f on $[a, b]$ is measurable if and only if any one of the following statements hold:
    i) For every $s \in R$ the set $\{ | f (x) \ge s\}$ is a measurable set.
    ii) For every $s \in R$ the set $\{x | f(x) < s\}$ is a measurable set.
    iii) For every $s \in R$ the set $\{ x | f(x) \le s\}$ is a measurable set.
   b) If f and g are measurable functions on $[a, b]$, then so are $f + g, f - g$ and fg. Furthermore, if $g(x) \ne 0 (a \le x \le b)$, then f/g is also measurable.

5. a) Define complete metric space. Show that R^2 is a complete metric space.
   b) Define normed linear space and also show that $d(x, y) = \|x - y\|$ is a metric.

6. a) A is a subset of R, then prove that A is connected if and only if A is an interval.
   b) Let ℓ^∞ denote the set of all bounded sequences of real numbers. If $x = \{x_n\}_{n=1}^\infty$ and $y = \{y_n\}_{n=1}^\infty$ are points in ℓ^∞. Show that $\langle M, \quad \rho \rangle$ is a metric space, where $\rho(x, y) = l.u.b. |x_n - y_n|$.

7. State and prove Caylay– Hamilton theorem. Verify Caylay—Hamilton theorem for the matrix
   $A = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$ and find its inverse.

8. a) If λ is a characteristic root of a non-singular matrix, then $(|A|)/\sqrt{\lambda}$ is a characteristic root of the adjoint matrix A.
   b) Express $A = \begin{bmatrix} -2+3i & 1-i & 2+i \\ 3 & 4-5i & 5 \\ 1 & 1+i & -2+2i \end{bmatrix}$ as the sum of a Hermitian and Skew-Hermitian matrix.